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CLINICAL PSYCHOSOMATIC OBSTETRICS AND GYNAECOLOGY

A Patient-Centred Biopsychosocial Practice

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Clinical Psychosomatic Obstetrics and Gynaecology

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A Patient-centred Biopsychosocial Practice

Edited by

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Abhi & Ravi

Who symbolise
All who return parental affection

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Preface

The principles of promoting human health through advancing knowledge are ethically driven. By following these precepts, this medical textbook intends to provide suitable knowledge to manage diseases resulting from mind–body or psychosomatic interactions. It starts by providing the scientific basis of psychosomatic interaction in disease causation, followed by its clinical application for managing related women's diseases. The field of these diseases is wide-ranging, starting from preconception and extending into the menopause, and also includes the transgenerational aspects of psychosomatic ill-health during a stressful pregnancy that may affect the fetus. The chapters in this book pertain to both emergency and routine management of clinically significant psychosomatic conditions related to physical, psychological, and social determinants of health.

My clinical experience of working in hospitals in the UK confirmed a desperate need, and provided me with the impetus to produce this book to fill a gap in the relevant aspects of medical education. During my training in obstetrics and gynaecology, I had increasingly recognised that many patients did not fall within the commonly practised medical model that holds physical factors solely accountable for all disease manifestations. Patients who did not fit the usual model presented with diverse physical symptoms that could represent every plausible obstetric and gynaecological health condition encountered, but the effects of concomitant psychosocial factors that modified the presenting symptomatology were ignored by attending medical staff. This often led to continuing biopsychosocial symptoms in these patients, whose physicians only attributed blame for their symptomatology to physical factors. Such patients returned repeatedly to seek further healthcare for symptom relief because of the unsatisfactory results of previous inadequate management. They often felt reassured when they were evaluated by the occasional physician who practised a psychosomatic approach in consultations; such management, which ended in symptom relief and patient satisfaction, advanced my learning of biopsychosocial management. Time and again it was brought home to me that when physicians missed the psychosocial aspect, their management had led to patient dissatisfaction, with repeat hospital attendances. Consequently, this was bound to impact on the health facility's finite resources. I realised that a medical textbook encompassing these disease conditions would aid in the further understanding of such conditions, and improve the care of these patients.

By increasing the physician's knowledge of psychosomatic interaction and associated biopsychosocial factors, appropriate management could be provided, and repeat hospital/clinic attendances by patients minimised. This would also promote ethical healthcare, as misdiagnosis, and consequent harm from providing the wrong treatment, would be avoided. My intention to gain further knowledge prompted me to carry out doctoral studies, which assessed quantitatively a large sample of women with gynaecological problems after their first childbirth. My study confirmed that there were biopsychosocial needs of these mothers even one year after delivery that were missed by the prevailing healthcare provision. Although presentations and publications followed, I also learnt of resistance in some quarters where the concomitant psychosocial aspect was considered unimportant. Despite being under-recognised by medical personnel, many patients considered the biopsychosocial aspect as being of significance in relieving symptoms and effecting cure. Limited understanding of psychosomatic interactions in managing patients with symptoms due to such pathology led to a persisting morbidity that could be grievous. This was reflected

in the UK's *Maternal Mortality* reports for the last four triennia, where a lack of recognition of such aetiology led to severe morbidity, sometimes ending in maternal demise.

I started to impart such knowledge about the biological, psychological, and social aspects of women's health by organising teaching sessions regarding clinical psychosomatic interfaces at scientific meetings in the UK and overseas, but wider dissemination was needed. When practising a patient-centred approach with individualised care, it was obligatory to pay attention to physical, mental, and social health. Although the subspecialty of Psychosomatic Obstetrics and Gynaecology had been practiced in the rest of Western Europe and Japan, since the twentieth century, less attention had been given to it in the UK, thus a need to propagate this aspect for improving women's health existed. As Chair of the British Society of Psychosomatic Obstetrics, Gynaecology, and Andrology, I approached officials of the Royal College of Obstetricians and Gynaecologists to modify existing viewpoints; it is now recognised in the UK as a subspecialty. However, there was a dearth of textbooks in the English language that interested physicians/postgraduates could follow if they chose to practise this subspecialty. Seeing the global need for such a medical textbook to facilitate effective patient care, I decided to produce this first volume of *Clinical Psychosomatic Obstetrics and Gynaecology* under the aegis of Oxford University Press. Contributions from experts in the UK, along with international experts were invited. I am grateful to the co-authors from these countries, who have provided chapters to this volume; we have thus been able to reflect all clinical facets of psychosomatic women's diseases.

Acknowledgements: My sincere thanks are due to all authors who have contributed to this volume. I am grateful also to the patients who gave me the incentive to produce such a book to educate clinicians. I thank Oxford University Press for undertaking this publishing venture; this includes all who are associated with publishing the book, particularly Helen Liepman, James Oates, and Katie Bishop, who deserve my kudos for being so patient during the unexpected trials and tribulations while writing. Catherine Barnes, who initiated the work, along with Eloise Moir-Ford are also due my thanks for their support. Members of Oxford University Press, S. Kumar & S. Thivya who managed the production aspect, and everyone who brought this book into the world, deserve praise. I am obligated to Professors J. Walker, F. Oyebode, D. Morton, R. Holder, H. Pattison, H. Chochinov, K. Gun, S. Das, Baroness Hollins, Mr R. Callender, A. Warwick, A. Bates, C. Cietak, W. Hannay, I. Allen, Ms T. Allan, A. Mathews, S. Michael, and S. Josephine, for supporting my learning/dissemination of relevant psychosomatic knowledge. The librarians at Kidderminster and Royal Worcester Hospitals, particularly Sam, Jan, Carley-Ann, and Diane, those at Russells Hall Hospital, namely, Jane, Sally, and Grace, and those from the British Medical Association Library, the Royal College of Obstetricians & Gynaecologists, and the Royal Society of Medicine, have my earnest thanks.

I am extremely grateful to my family who supported me throughout the ups and downs of the project. This includes my son, Abhilash, who encouraged my aim to advance knowledge, proofread, and gave astute comments for the first draft, loaned his medical history/philosophy books, and provided technical expertise; my son, Ravindra, who gave unending support but left this world last year due to a failure of medical care provision; my husband, Nanak, who bore with my diverted attention; my parents Sonia Jagatarini and Hariji, who encouraged my learning along with Maheshji, and my siblings Rakesh, Sharad, Vibha, and Shobha who reaffirmed their belief in me in accomplishing this educational mission. I also thank other unnamed individuals who contributed to the production/publicity of this medical textbook.

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The aims of the First World Congress of Obstetrics, Gynaecology and Andrology was to educate health professionals and health providers about how best to support women and men with disease conditions affecting both physical and mental health that have social implications; this book has a similar aim. The logo signifies the clinical practice that doctors follow, and represents the Greek serpent entwined symbol of Asclepius (God of Health), which in the logo forms '*Psi*' representing the '*Psyche*' and the letter '*Sigma*' that encircles Britain as the '*Soma*' or body—namely, 'Psychosomatic'. The logo also incorporates the Greek letters *alpha (α)* (Andrology)—the male, *gune* (Gynaecology)—the female, and the Latin '*O*' for *Obstetricus* (Obstetrics); the meaning of Psychosomatic Obstetrics, Gynaecology and Andrology is thus illustrated.

Foreword

Sir Sabratnam Arulkumaran

My sincere congratulations to Editor, Dr Mira Lal, and her team of internationally renowned authors, for bringing out this most important volume of literature on *Clinical Psychosomatic Obstetrics and Gynaecology*. The fundamental tenant of health is that women should have physical, mental, and emotional health. There are several books that tackle the management of problems in Obstetrics and Gynaecology related to physical health but very little about the psychosomatic aspects; the latter, however, have an important influence on preserving good health, besides facilitating a quick and complete recovery from ill-health if recognised and the appropriate treatment given. The book emphasises that we should treat the ill comprehensively, and not only address the physical aspects of disease but also pay due attention to psychosocial issues that are acting simultaneously.

Chapter 1 provides the basic scientific foundation of mind–body interactions that lead to psychosomatic disease, which is initiated and maintained by biological, psychological, and social factors. Treatment of such diseases should thus involve addressing all relevant aspects. In Chapter 2, the 'why' and 'how' of teaching psychosomatic obstetrics and gynaecology is discussed. The next two chapters deal with maternal mood in pregnancy in addition to preconceptual and postpartum mental health. These are important chapters for those who provide care for pregnant mothers.

Migraine and hypertensive disorders in pregnancy can cripple the woman's health. This is discussed in Chapter 5. Both are heavily influenced by the psychosomatic temperament of the individual. If tackled properly by considering the initiating biopsychosocial factors, the incidence, and severity of these conditions can be reduced when compared with treatment of the physical symptoms alone. For example, migraine can be prevented by averting the triggering events, such as stress, having adequate rest, being well-hydrated, and avoiding medication overuse. Perceived disease severity, especially if linked to physical as well as emotional pain, is influenced by the mental and emotional state of the individual, and is well tackled in Chapter 6. Premenstrual disorders have a major overplay with psychosomatic health, and new thoughts are provided to tackle this problem in Chapter 7. Chapter 8 outlines the need for women's psychosomatic health promotion and the biopsychosociocultural nexus. Aetiology, diagnosis, and treatment of vulval pain can be a gynaecologist's nightmare, and this may be more evident if adequate consideration is not given to the background of psychosomatic issues. Chapter 9 provides relevant information on how this condition could be managed.

Cancer debilitates individuals physically, mentally, and emotionally, not only with regards to their acceptance of the condition and its treatment, but also to its impact on the sexual health of those affected. Chapters 10 and 11 provide information on how to manage these difficult issues. Migration, with the associated gender and cultural issues related to this unexpected change of lifestyle, has a major impact on the individual's psychosomatic health, and Chapter 12 deals with many of these issues.

This book is highly recommended for practising obstetricians and gynaecologists, trainees, general practitioners, and those with an interest, professional, or otherwise, in developing a more complete understanding of women's psychosomatic health.

Sir Sabaratnam Arulkumaran, PhD DSc FRCS FRCOG
14 August 2016

Foreword

Baroness Finlay of Llandaff

For years, the profound interplay between the mind and the body was ignored by clinicians. Although physiology and pathology were studied extensively, there was scant regard for those who recognise the profoundly troubling effect of anxiety, grief, and depression on function. The only conditions in the category of 'psychological' were postnatal depression and psychosis, when the presence of psychiatric disturbance was recognised, and classified as yet another pathology.

But now at last, the impact of psychosocial factors on women's health has begun to come to the fore, in large part thanks to a small band of professionals who listened to women presenting with problems, who observed common factors and differences, and who asked questions. By collating their findings, they have shown scientific evidence of the impact of psychosocial factors on many aspects of female reproductive medicine.

Several of this group are contributors to this book. They have had a transformative effect on the way services to women are delivered in some places, but the die-hard attitudes of an old-school approach continues in many hospitals around the world.

Any interventional procedure affects a woman's perception of her own femininity and sexuality, and for some this may be devastating. The immensely cruel procedures in female genital mutilation rob children of their future lives as full bodied women as well as their innocence, and childhood. These girls often show the deep psychological scar of being unable to trust, unable to experience unfettered joy, and unable to take pleasure in any physical relationship. They can become depressed, enslaved by the mutilation inflicted on them directly or indirectly by the very people they had trusted implicitly, and from whom they sought comfort—their mothers.

When disease such as cancer strikes, the ravages of the malignancy are compounded by the effects of the treatment aimed at controlling the disease. While efforts are focused on surgical procedures to cut out offending tissue, and at radiotherapy and chemotherapy to destroy it, the deep scars on the woman's psyche have until now received little attention. Loss of fertility is devastating to a young woman, whether or not she has already had children—how wrong can it be to make an assumption that because a woman has 'completed her family' she will not be deeply affected by the finality imposed by loss of the uterus or ovaries.

Sexuality in women has been little discussed until recently. Gynaecological cancers, particularly those associated with the human papilloma virus, can lead to questions of responsibility and transmission in the woman, and her current partner. The erosive effect of vulvar and cervical cancers on genitalia can lead to additional body-image problems through smell from exudate, as well as the obvious effect in intimate relationships. In this context, it is bizarre that some partners insist on ongoing sexual intercourse despite discomfort and even bleeding caused by forced penetration, which can be considered tantamount to abuse. Where feasible, relevant advice should aim to educate partners who may be insensitive to the trauma that they have caused. For such women, permission to talk openly about the difficulties they are experiencing is crucial to their overall well-being, as well as, sometimes, to their safety.

A tragedy of this situation is that so much of this disease is now preventable. For the vast majority of women, screening programmes to detect early disease are unavailable; the future focus must be on prevention if women are to be healthy to raise their children. When women die leaving

young orphans, the societal impact becomes immense. Across the world, obesity is becoming an increasing medical problem. Apart from its association with uterine and breast malignancy, the complex body image distortions that allow a woman to become grossly obese may also be linked to her wrong perceptions of herself, as also seen in association with anorexia.

For too long, societies have ignored the psychosocial effects of disease and the interplaying impact on gynaecological functioning of psychosocial distress. They are at last now becoming recognised in mainstream medical practice. This book tackles the previously buried subject of the interplay between a woman's psychological state, her social situation, and her gynaecological functioning in health and in disease. It opens the reader's eyes to the private anguish of so many women, which until now has gone largely unrecognised.

Professor Baroness Finlay, FRCP, FRCGP, FMedSci, FHEA, FLSW,
29th August 2016

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Glossary of definitions; anatomical/ physiological/pathological inferences

Abruption Separation of a normally located placenta from the uterine wall prior to delivery of the fetus.

Addiction A behaviour that gives pleasure, and serves as an escape from discomfort.

Adjustment disorder Conditions that manifest as symptoms of intense psychological stress, which induce anxiety and a depressive state of greater severity than would be expected for the stress being experienced, and consequently leading to a disruption of day-to-day activities.

Allodynia Perception of pain from an innocuous stimulus.

Anhedonia Lack of pleasure or the capacity to experience it.

Anxiety An abnormal mental state where the patient is aware of being nervous or frightened often expressed with concurrent physical symptoms, such as breathlessness, dizziness, palpitations, tense muscles, perspiration, nausea, vomiting, diarrhoea, headaches, and tiredness, which suggest psychosomatic interactions.

Apareunia Inability to perform coitus due to physical or psychological sexual dysfunction.

Biopsychosocial factors in psychosomatic health or disease The following may help to explain the difference between 'biopsychosocial' and 'psychosomatic'. Biological (*ankle sprain*), psychological (*long-term pain after healing*), and social (*refusing to honour social obligations*) factors in a person's life can predispose the individual to initiate and maintain the psychosomatic interactions that create health or disease (unwell from perceived pain) (see Chapters 1,2). The individual's response to the pain may further be modified by her/his cultural/personal values (see vignettes in Chapters 4,6,7,8,12).

Bradycardia Slowing of the heart rate below the normal range.

Carcinoma-*in-situ* (CIS) A clinical condition where neoplastic cells replace the normal cells of the cervical epithelium but there is no breach in the basement membrane.

Cannulation Inserting a hypodermic needle into a blood vessel to carry out medical investigations or inject intravenous fluids.

Caput Refers to caput succedaneum, which is a diffuse swelling of the fetal scalp caused by oedema due to the pressure of the scalp against the dilating cervix during labour; it overlies the leading part of the skull.

Cardiotocograph A tracing of the fetal heart.

Cervical intraepithelial neoplasia (CIN) A clinical condition where the cells of the cervical epithelium undergo malignant changes but the basement membrane remains intact; the disease is localised.

Chronic pelvic pain This is defined as lower abdominal pain, which lasts for six months or longer, and is not associated exclusively with menstruation, intercourse, or pregnancy.

Clinical vignette (vignette) A brief written case history of a fictitious patient, based on a realistic clinical situation that is accompanied by one or more questions that explore what a physician would do if presented with the actual patient.

Disease A medical condition with identifying symptoms and signs that causes pain, dysfunction, distress, social problems, or death to the person afflicted.

Domestic violence This can be defined as the physical assault at home by an intimate partner or a family member; may also include sexual or emotional assault, and economic abuse.

Drug addiction A behavioural syndrome where one is unable to stop using a drug, despite harmful consequences such as failure to meet family, work, and social obligations, with drug procurement and use being the motivational force.

Drug dependence In this state, the individual is dependent on the drug for physical and psychological functioning so that abstinence causes symptoms such as sweating or dysphoria.

Dyspareunia Painful sexual intercourse experienced by the female due to a persisting hymeneal membrane or infection/inflammation, perineal scar, vaginal dryness or atrophy, or spasm of vaginal muscles.

Dysphoria Medical terminology that refers to anxiety with low mood and restlessness.

Dysplasia Historically used to categorise cervical epithelial cells that have undergone premalignant changes but to a lesser degree than CIS.

Engagement (in Obstetrics) Descent of the widest part of the presenting part of the baby's head through the pelvic inlet to be at or below the ischial spines; abdominally, it palpates as fixed when the head is deeply engaged.

Epicritic pain Initial pain, which is sharp in nature, and conducted by small myelinated fast fibres; the 'first response'.

Extreme obesity Terminology used to categorise individuals with a BMI of ≥40kg/m^2.

Fecundity A female's ability to produce live offspring.

Fetal programming The concept that the environment *in utero*, during different critical periods for specific outcomes, can alter the development of the fetus, with a permanent effect on the child.

Fit/seizure Medical terminology for a sudden violent attack of a disease (e.g. epilepsy), especially when marked by convulsions or unconsciousness.

Fully dilated cervix The diameter of the internal os of the cervix is measured in centimetres by vaginal examination from 0 cm to 10 cm; 10 cm corresponds to a fully dilated cervix.

Gender This terminology refers to the roles and expectations attributed to men and women in a given society, and varies with the roles, norms, and values of a given society or era.

Hyperalgesia Perceived increase in the severity of pain.

Illness A state of body or mind that causes a feeling of discomfort, distress, or pain—the patient's experience.

Infertility This refers to the inability to conceive despite regular unprotected intercourse for 1–2 years with the duration being reduced where fecundity is lower, as in the ageing female.

Lie (in Obstetrics) The relationship between the longitudinal axis of the fetus, and the long axis of the uterus; a lie can be longitudinal, oblique, or transverse.

Limbic system This consists of the hypothalamus, amygdalae, hippocampus, uncus, parahippocampal gyrus, paraolfactory area, the fornix, and the mammillary bodies, which relate to emotions and social behaviour.

Low-cavity forceps delivery Mode of applying forceps to facilitate vaginal delivery where the biparietal diameter of the fetal head has passed ≥2 cm below the level of the ischial spines.

Migration, emigrants, and refugees Migration involves moving to a new location that is permanent or semi-permanent on an individual basis, in small groups or in large numbers, due to economic necessity (emigrants) or sociocultural strife and the effects of war (refugees).

Mood disorders Mood disorders are related to a loss of the normal control of mood, thereby resulting in subjective distress; these individuals present as depressed mood with anhedonia or loss of interest and pleasure, sometimes accompanied by a lack of energy or concentration and impaired thinking, and/or thoughts of self-harm or death.

Moulding The natural process by which the baby's head is shaped during labour with movement at the suture lines of the skull bones; it is degree 1 moulding when the adjacent skull bones at sutures are apposed and degree 2 when the adjacent skull bones overlap but this is reducible. Degree 3 occurs when the overlapping bone edges at sutures are irreducible—a contraindication for assisted delivery.

Obesity It is defined as a body mass index (BMI) of ≥30 kg/m^2.

Pain An unpleasant sensory or emotional experience that is associated with actual or potential tissue damage, or described in terms of such damage.

Partum and natal Partum refers to 'childbirth' and natal to 'pertaining to birth'. Both are used synonymously in this book when referring to 'childbirth' as part of a descriptive word, e.g. after delivery, as postpartum or postnatal.

Pelvic floor/perineal dysfunction This relates to symptoms of incontinence and sexual dysfunction resulting from the loss of the anatomical/functional integrity of the pelvic diaphragm and the perineum.

Preconceptual This is the period prior to conception (routinely six months before conception but in some women under specific medical treatment it could be earlier).

Perinatal During the period around birth (this has been defined as five months before and one month after birth).

Position (in Obstetrics) The relationship of the presenting part of the fetus to the maternal pelvis.

Postvention Appropriate support after a difficult event.

Premature birth Birth of a baby before the developing organs are mature enough to allow normal postnatal survival; such infants are at greater risk for short- and long-term complications, including disabilities and impediments in growth and mental development.

Presentation (in Obstetrics) The leading anatomical fetal part that is close to the pelvic inlet; e.g. 'cephalic' when the head presents.

Preterm birth Birth of a baby of less than 37 weeks gestational age.

Preventive medicine The branch of medical science, which deals with methods (such as vaccination) of preventing the occurrence of disease.

Protopathic pain Pain that follows the initial pain, and is conducted through slower unmyelinated fibres; the 'second response'.

Psycho-oncology The branch of medical science, which deals with the clinical academic fields that investigate the mental repercussions of cancer, and its treatment.

Psychosomatic health or disease Relating to the interaction of the '*psyche*' (Greek *etymology*) or mind (the central nervous and limbic systems) with the '*soma*' (Greek *etymology*) or body (endocrinological, cardiovascular, respiratory, gastrointestinal, peripheral nervous,

genitourinary, locomotor, integumentary, and haematological systems) to maintain psychosomatic health or create psychosomatic disease (see Chapter 1).

Puerperium The period of about six weeks after childbirth, during which the mother's reproductive organs return close to their original non-pregnant condition.

Rape or sexual assault An offence where sex is carried out without the victim's consent by an individual known to the victim or a stranger.

Scenario A prototype case used in problem-based learning.

Second stage The stage of labour when the cervix is fully dilated, and with good uterine contractions the fetus descends through the birth canal while the labouring woman pushes actively aiming to accomplish vaginal delivery. Delivery may be spontaneous or assisted.

Station The relationship between the leading part of the fetal presenting part and the maternal ischial spines. If it is at the level of the spines, it is at '0 (zero)' station, if it is 2 cm below, it is at '+2' station, and if 3 cm below, it is at '+3' station.

Substance misuse Improper use of a prescribed or non-prescribed drug.

Tachycardia An increase in the heart rate above the normal range.

Teratogen An agent, such as a drug, a microbe, or a form of radiation that can cause malformations or functional damage to the conceptus.

Termination of pregnancy Legalised medical/surgical interruption of pregnancy, which in the UK is carried out until 23 completed weeks and six days.

Tokophobia Etymology, from the Greek '*tokos*', meaning childbirth and '*phobos*', meaning fear, namely, a fear of childbirth (see vignette in Chapter 4).

Ventouse-assisted Medical terminology, which is synonymous with vacuum extraction, and refers to assisted delivery using the ventouse cup.

Vulval pain Pain involving the vulval tissue that is said to be chronic when lasting at least three months.

Abbreviations

ACOG	American College of Obstetricians and Gynaecologists
ACTH	Adrenocorticotrophic hormone
ADHD	Attention deficit hyperactivity disorder
AIDS	Acquired immune deficiency syndrome
ALSPAC	Avon Longitudinal Study of Parents and Children
ALT	Alanine transaminase
ANC	Antenatal clinic
APA	American Psychiatric Association
ART	Assisted reproductive technology
AST	Aspartate transaminase
BDNF	Brain-derived neurotrophic factor
BMI	Body mass index
BP	Blood pressure
βhCG	Beta-human chorionic gonadotropin
11β-HSD2	11β-hydroxysteroid dehydrogenase 2
CAT	Cognitive adaptation therapy
CBT	Cognitive behaviour therapy
CCT	Controlled cord traction
CGRP	Calcitonin gene-related peptide
CIGN	Cervical intraepithelial glandular neoplasia
CIN	Cervical intraepithelial neoplasia
CgA	Salivary chromogranin A
CNS	Central nervous system
COC	Combined oral contraceptive
CRF	Corticotropin releasing factor
CRP	C-reactive protein
CTG	Cardiotocograph
CT scan	Computerised tomography scan
DA	Dopamine
DRS	Delirium Rating Scale
DRSP	Daily Record of Severity of Problems
DSM-5	*Diagnostic and Statistical Manual of Mental Disorders*, 5th edition
DVT	Deep venous thrombosis
ECV	External cephalic version
EMR	Electronic medical records
ENGAGE	ENquiry into women with GAstric banding in pregnancy to Guide management and improve Experience
EPS	Evening primrose oil
FVL	Factor V Leiden
FGC	Female genital cutting
FGM	Female genital mutilation
5HT2	5-hydroxytryptamine
FIGO	International Federation of Gynecology and Obstetrics
GABA	Gamma aminobutyric acid
GH	Gestational hypertension
Glu	Glutamate
GnRH	Gonadotrophin-releasing hormone
GOPD	Gynaecological outpatient department
GP	General Practitioner
HAL	Hexylaminolevulinate
HDU	High Dependency Unit
HIV	Human immunodeficiency virus
HPA axis	Hypothalamic-pituitary-adrenal axis
HPV	Human Papilloma Virus
HRQoL	Health-related quality-of-life
HRV	Heart-rate variability
HSIL	High-grade squamous epithelial lesions
IBS	Irritable bowel syndrome
IGF	Insulin-like growth factor
IHS	International Headache Society

IL-1	Interleukins
IOL	Induction of labour
IOM	Institute of Medicine
ISSVD	International Society for the Study of Vulvo-vaginal Disease
IUFD	Intrauterine fetal death
IVF	*In-vitro* fertilisation
LEEP	Loop electrosurgical excision procedure
LDH	Lactate dehydrogenase
LH	Luteinising hormone
LLETZ	Large loop excision of the transformation zone
LOA	Left occipito-anterior
LOP	Left occipito-posterior
LOT	Left occipito-transverse
LSCS	Lower segment caesarean section
LSIL	Low-grade squamous epithelial lesions
LW	Labour ward
MA	Migraine with aura
MDGs	Millennium Development Goals
MDI	Mental Developmental Index
MIN	Multicentric intraepithelial neoplasia
MM	Maternal mortality
MO	Migraine without aura
MRI	Magnetic resonance imaging
MRM	Menstrually related migraine
MTHFR	Methylentetrahydrofolate reductase
MW	Midwife
NICE	National Institute for Health and Clinical Excellence
NSAID	Non-steroidal inflammatory drug
NVD	Normal vaginal delivery
OA	Occipito-anterior
OCs	Oral contraceptives
OSBF	Outpatient Service for Bereaved Families
PE	Pre-eclampsia
PCW	Palliative care ward
PCOS	Polycystic ovarian syndrome
PDT	Photodynamic therapy
PET	Positron emission tomography
PIH	Pregnancy induced hypertension
PMDD	Premenstrual dysphoric disorder
PMM	Pure menstrual migraine
PMS	Premenstrual syndrome
PNES	Psychogenic non-epileptic seizures
PTSD	Post-traumatic stress disorder
PV	Per vaginum
QoL	Quality of life
RCOG	Royal College of Obstetricians and Gynaecologists
SCBU	Special Care Baby Unit
SDGs	Sustainable Developmental Goals
SERM	Selective oestrogen receptor modulators
SFT	Subcutaneous fat thickness
SP	State protection
SRIs	Serotonin reuptake inhibitors
SSCMDT	Specialist kin cancer multidisciplinary team
SSRIs	Selective serotonin reuptake inhibitors
STD	Sexually transmitted disease
STI	Sexually transmitted infection
SUDEP	Sudden unexpected death in epilepsy
SVD	Spontaneous vaginal delivery
TCAD	Tricyclic antidepressants
TNFα	Tumour necrosis factor alpha
TOP	Termination of pregnancy
TVS	Transvaginal scanning
UN	United Nations
U/SS	Ultrasound scan
VAIN	Vaginal intraepithelial neoplasia
VC	Vulval clinic
v-EEG	Video-electroencephalogram
VIN	Vulval intraepithelial neoplasia
VRL-1	Vanilloid receptor 1
WL	Waiting list
WHO	World Health Organization
YSD	Years since diagnosis

Introduction

The introduction to this book intends to give an outline of the subject area of *Clinical Psychosomatic Obstetrics and Gynaecology*, which incorporates the generation of diseases due to mind–body (psychosomatic) interaction. The contributions to this book from different regions of the world, affirm the need to practise such a subspecialty worldwide, while the extensive bibliography in the book chapters confirms its wide scope. Nevertheless, as mentioned in the preface, awareness is limited, despite a need for practising the psychosomatic approach that advocates simultaneous evaluation of the body as well as the mind, to implement effective patient care. The scarcity of a suitable textbook to serve as a basic book or for reference purposes to provide guidance for the clinical care of such patients, motivated me to consider producing such a book to further medical education.

Accordingly, this book aims to foster a deeper understanding of diseases that fall within the sphere of *Clinical Psychosomatic Obstetrics and Gynaecology*. It is a discipline that embraces the study of physical, mental and social factors in promoting women's reproductive health or generating disease. Advances in science and technology have helped unravel numerous conundrums, yet the aetiopathology of most psychosomatic symptoms/signs is ill-understood. Emerging new diseases reflect infective, inflammatory, malignant, and genetic aetiologies; they can interact with the constantly changing psychological, and social milieu to generate symptoms of psychosomatic women's diseases. These disease conditions continue to be misunderstood by some health professionals, and thus their clinical significance is underestimated. Non-recognition or summary dismissal of psychosomatic health conditions has led to inadequate management, consumer dissatisfaction, and consequent overuse of health facilities. Moreover, they may span the gamut of disciplines, which are associated with female health or disease. In addition to obstetrics and gynaecology, these specialisms include psychiatry, neurology, public health, psychology, sociology, and paediatrics. To facilitate comprehensive learning through a single textbook, such knowledge has been assimilated in this volume for practitioners of *Clinical Psychosomatic Obstetrics and Gynaecology*.

The psychosomatic approach in patient care also encourages greater recognition of the compassionate aspect of medicine. Its clinical application would aid in the provision of patient-centred healthcare currently being advocated for managing certain diseases cost-effectively. The chapters in this book encompass these facets of psychosomatic disease conditions that are further exemplified by over 30 clinical vignettes (vignettes) drawn from anonymised real-life encounters, to better illustrate presentations of the disease conditions in clinical practice. The aetiopathology of psychosomatic interactions is mainly explained in Chapter 1, and partly in Chapter 2, while the clinical application of this concept to the management of relevant disease conditions is discussed in other chapters. Chapters 3, 4, and 5 emphasise Obstetrics, while Chapters 7, 9, 10, and 11, focus on Gynaecology. Chapters 6 and 8 address both specialisms, and Chapter 12 presents diseases that arise from voluntary population moves for economic benefit or enforced refugee movements due to ongoing wars. Although the economic impact of misinterpretation of these disease conditions has not been quantified, it is likely that a significant amount of human and economic resources would have been expended over the years due to cursory management that disregarded the psychosocial aspect. An overview of the content of each chapter is outlined to assist understanding of

the topics addressed. The vignettes with presenting complaints, and biopsychosocial past history, further explicate the contents and should encourage the reader to reflect on patient management.

The fundamentals of the scientific basis of *Clinical Psychosomatic Obstetrics and Gynaecology*, and the need for practising it, is clearly laid out in the first chapter. It starts with a summary of the concepts of ancient medicine, which had recognised the importance of keen observation in the diagnosis of diseases both of the body and of the mind, when formulating appropriate management. The teachings of Soranus, who wrote extensively on women's diseases, and influenced other Greek and Roman physicians is presented. His observations of medical practice at the time show recognition of certain health conditions that have persisted. Deductive reasoning behind the treatment recommended was followed. These observations informed the teaching at medical schools from medieval times onwards, and led some medical practitioners to integrate the humanistic approach in patient care. This legacy, consisting of a body of theoretical and practical text, influenced European medicine considerably. The scientific basis (anatomy, physiology and pathology) of *Clinical Psychosomatic Obstetrics and Gynaecology* is elaborated next with 18 illustrations and four Tables. These will enhance the understanding of the psychosomatic aetiopathogenesis. A history of the underlying concepts of psychosomatic thinking, which evolved over the last two centuries follows; the psychosomatic concept prevailed, despite phases where intra- and inter-specialty turf wars were endemic of the lack of consensus. Followers of different viewpoints clashed and polarised patient management. A short section is devoted to Sir William Osler's biography. He was influenced by Greek physicians, and along with his mastery of pathology and good observation, practised patient-centred care; he used a psychosomatic approach in the management of certain diseases. As with other chapters of this book, the relevant subject area is vast, and had to be condensed considerably.

Teaching and training in Psychosomatic Obstetrics and Gynaecology is clarified in Chapter 2. The biopsychosocial model presented, along with clinical examples of its applicability to different clinical scenarios that clinicians face daily is practicable. Specialised communication tailored to the clinician's personality, in addition to that of the patient who is being assessed, is one of the skills intrinsic to psychosomatic training; the theory behind it is discussed. We taught such management, which was well received by diverse delegates at a World Congress (see page ix). Advice on how to include biopsychosocial factors when evaluating certain diseases, and thus facilitate apt management, will also benefit the reader.

In the third chapter, the detrimental effect of maternal stress on fetal welfare is discussed. This has garnered considerable interest, with suggestions that maternal anxiety and depression has far reaching consequences on both the fetus and the infant. It is attributed to alterations in the hypothalamopituitary axis with resultant endocrinological effects on organ systems, and infant behaviour. The hypothesis that maternal stress affects the infant's neurological development to such a degree that it disrupts the emotional well-being of some infants, and may be transmitted to their descendants, raises major concerns. Further investigations are ongoing.

In the fourth chapter, mental health issues in relation to psychosomatic illnesses from periconception to postpartum are presented. Normal adaptation to childbearing, both physical and emotional, and the impact of social interactions in preventing ill-health are discussed. Distinguishing the physiological adaptations of pregnancy from the pathological can be challenging, as is observed between the mild vomiting of pregnancy, and the more severe hyperemesis gravidarum. Similarly, concerns about pregnancy and childbirth may be minimal or expressed as anxiety or depression; symptoms may overlap to present as dysphoria. Manifestations specific to childbearing, such as tokophobia, are also addressed, along with nonspecific manifestations, such as non-epileptic attacks. The chapter also includes guidance for health professionals, who may have to manage acute-on-chronic psychosomatic illnesses, or those psychosomatic conditions that arise *de novo*,

and then progress to become chronic conditions. Management can be controversial as the maternal disease condition can impinge on fetal health, yet the treatments prescribed may have adverse feto–maternal sequelae, including teratogenicity. Thus, cautious prescribing is advocated.

In the fifth chapter, the association between pregnancy-related hypertension and migraine is discussed. Headaches, including migraine, are common neurological complaints but usually without significant underlying neurological disease; the end results of most diagnostic workups in these patients reveal no underlying cause. This can be frustrating, not only to the patient but also to the clinician, whose reassurance that no cause has been identified may cause anxiety. It is also distressing to those patients who want a more definitive diagnosis, and treatment. Pregnant women with severe hypertensive disorders undergo intense feto–maternal monitoring, and receive a tailored cocktail of antihypertensives, steroids, and sometimes statins; they can be at increased risk of preterm delivery. As hypertensive disorders cause major maternal and fetal morbidity/mortality, their potential relationship to migraine deserves exploration.

The sixth chapter focuses on the patient's perception of disease, which logically requires a greater attention to subjective evaluation. There is emphasis of the value of assessing the patient's perception of the impact of disease severity along with that perceived by attending health personnel. Among other deliberations, the chapter includes an evaluation of the biopsychosocial impact of incontinence on the mother and its effect on infant-bonding, relationships, and other maternal roles. Findings from the clinical application of an instrument developed to evaluate the perceived severity of biopsychosocial morbidity from maternal pelvic floor dysfunction are presented. The physical and emotional pain of pregnancy loss, and infertility/subfertility are discussed next. This is followed by a discussion of the ordeal surrounding the physical and emotional pain associated with a diagnosis of chronic pelvic pain. A psychosomatic approach would help in reducing the impact of such complex aetiopathology on the sufferer, especially if applied before the malady is ingrained.

In the seventh chapter, the variegated presentations of premenstrual syndrome, and its more severe counterpart, premenstrual dysphoric disorder, are described. This chapter details definitions, prevalence, symptomatology, aetiopathogenesis, and therapeutic modalities of these psychosomatic disorders; the associated physical, psychological, and social effects on the sufferer are also presented. These can be of sufficient magnitude to negatively impact on the sufferer's quality-of-life. The understanding of the aetiopathology remains obscure, so the management is eclectic. A vignette depicts the lack of response to conservative management with the distressed patient requesting the extreme form of surgical treatment on offer. All conservative options are however, not on offer at that health facility.

In the eighth chapter, the benefits of early intervention in promoting biopsychosocial aspects of reproductive health, and thus preventing disease are discussed. The topics include cancer and obesity, and both gynaecological and obstetric problems related to these subject areas are detailed. Pertinent aspects of lower genital tract infections, cancer screening, and its treatment in females of all ages are addressed. It reiterates the fact that psychosomatic disease conditions created by sociocultural factors or aggressive healthcare measures could be prevented; their affects could be minimised by closer scrutiny of initiating factors. Promoting women's psychosomatic health by preventing disease conditions arising from the biological, psychological, social, and cultural factors that modify psychosomatic interactions, and generate disease conditions arising from childhood, are deliberated upon. Prevention of precancer by using barrier methods, HPV vaccination, and colposcopically-directed evaluation or early treatment, are debated. Primary or secondary prevention rather than treatment, even if given early is stressed, because of the higher morbidity with the latter. Tailoring management to a select population along with the benefits of providing patient-centred care are emphasised.

In the ninth chapter, vulval pain is examined. The limitations of the current classification of the disease are explained. Vulval pain causes considerable misery, which impacts on the sufferer's biopsychosocial health and her quality-of-life, including her relationship with her partner. The uncertainty about the aetiopathogenesis with multiple causative factors being hypothesised precludes definitive investigations and treatment. Dissatisfaction with conservative management can result in more interventionist approaches that culminate in the excision of the entire area of irritation as a last resort. The wider psychosomatic implications are discussed.

Psycho-oncology is addressed in Chapters 10 and 11. In Chapter 10, the psychosocial aspects of gynaecological cancer are discussed. The discussion includes issues that the patient confronts when diagnosed with cancer as well as those encountered when undergoing treatment. Pertinent psychosocial issues when the treatment fails, and the patient struggles to accept the inevitable negative outcome, are also broached upon. Despite advances in cancer management, the prognosis of many gynaecological cancers is less favourable when compared with other cancer types. The presence of cancer can lead to psychosomatic symptoms, which can discourage compliance with cancer therapy. Therefore, early detection of such conditions and concurrent psychosomatic management could improve outcomes. The authors also draw attention to the effect of the disease on other family members, particularly the partner.

In Chapter 11, the difficult predicament of patients who have been treated for gynaecological malignancy that compromise sexual functioning is underscored. Cancer survivors span a wide age range, with a number of patients preferentially abstaining from sex, whereas others express decreased sexual desire that could be contrary to the partner's wishes. It is important to provide appropriate advice to those who want to pursue a near-satisfactory sex life following treatment. Yet, many health professionals may be uncomfortable with discussing sexual problems, and can only provide minimal guidance, even when patients muster enough courage to request relevant advice. This issue can be addressed more effectively by imparting psychosomatic communication skills to the concerned medical professionals, so that patients find them more approachable.

In the twelfth chapter, the local and global health impacts of population shift, brought about by migration due to economic forces or continuing wars, are presented. Consequent changes in living conditions, and lifestyles for those involved, are discussed. This could potentially lead to an increase in the incidence of psychosomatic disease conditions. The implications of environmental influences in defining an individual's place in society, and the various pressures on girls and women, along with the role of partners in contributing to their positive or negative health, are addressed. The impact of these biopsychosocial factors on the female's various personal/social roles are also examined. The difficulties presented by differences in sociocultural values, and their influence on the acceptability of certain interventions are discussed. These issues with a global perspective are highly relevant in the current climate of continuing migration and warfare.

Psychosomatic obstetric and gynaecological disease conditions will continue to affect women in the twenty-first century and beyond. This underpins the need to promote awareness of many, often preventable, conditions that are seen in clinical practice. This book fulfils a pressing need for improving healthcare provision, by introducing psychosomatic teaching and training to clinicians; it is current. While a coordinated multidisciplinary group can play an active role in assessing and managing relevant manifestations, such organised groups are not widely available. Relevant healthcare provision is variable in high-income countries, and may be greatly limited in low- and middle-income countries. Training obstetricians/gynaecologists to provide psychosomatic healthcare would go towards addressing this growing need. This form of management concurs with the contemporary recognition of values in optimal healthcare provision. The chapters that follow will provide educational resources for trainees, practising clinicians, and medical students interested in learning the psychosomatic approach.

This textbook will complement, and build upon undergraduate and postgraduate textbooks in obstetrics and gynaecology to stimulate further reading. It should retain a useful place in the global teaching/training of both current and future medical practitioners who are striving for psychosomatic understanding. It will better address the challenges of health conditions arising from modern-day environments, including the effects of migration. In the chapters that follow, the depictions of the applications of quantitative patient-centred biopsychosocial management with additional learning points, will interest the reader. Finally, a few self-assessment exercises are provided to enhance learning further, and aid in identifying such clinical scenarios. This medical textbook could thus serve as a basis for understanding *Clinical Psychosomatic Obstetrics and Gynaecology* and enable satisfactory disease management.

Chapter 1

Clinically significant mind–body interactions: evolutionary history of the scientific basis

Mira Lal

Introduction

> It is imperative to study the cultures and societies that laid the foundations of medicine in the past. Lessons can be learned and mistakes can be avoided. However, the greatest advantage that history provides is the ability to take knowledge from the past and weave it into today's knowledge to improve future knowledge [1].

Disease conditions due to mind–body or psychosomatic (Greek '*psyche*' or mind and '*soma*' or body) interactions further associated with social factors are purported to lead to many obstetric and gynaecological complaints [2–5]. Over the years, there have been variations in concepts related to the term 'psychosomatic'. Historical records suggest that manifestations such as headaches, which are related to the autonomic and somatosensory systems, have persisted since ancient times [6] as symptoms resulting from mind–body interactions. Conversely, such presentations may have changed in character with the passage of time, as observed with the health condition hysteria when traced from the eighteenth to the twentieth centuries. The term hysteria has been associated with a variegated range of symptoms across the passage of time. For instance, previously described presentations of 'hysterical paralysis' may more commonly manifest as various types of 'pain' in more recent years. This could be because of progressive changes in medical attitudes towards hysteria, which gives it less importance as a genuine symptom requiring medical treatment. This may be perceived by patients, particularly those with histrionic personalities. Such patients often manifest those symptoms that they believe would be considered as authentic, and more acceptable to the community that they associate with. Allegedly, such behaviour could also occur because patients are more likely to present with symptoms that they consider would be regarded as genuine by their attending physicians [7]. Often, these patients manifest a condition that would increase their chances of receiving medical treatment, besides being of great significance when judged by their peers, and immediate family whose attention they seek. However, there remains the danger of a perplexing clinical condition being classified as hysteria or vice-versa by clinicians familiar with one aspect only, thereby delaying effective treatment of the presenting symptom-complex, sometimes with grave sequelae.

Although clear textual evidence is unavailable regarding primitive healthcare, there is archaeological evidence, such as very early cave inscriptions, suggesting that primitive peoples believed that the body can be affected by external mystical forces. The practice of 'couvade' after childbirth

was an example of this, where the father of the newborn stayed in bed, and undertook rituals to protect the mother and their baby from external evil forces [8]. The priest and the medicine man often represented in one person, combined the functions of religion, magic, healing, and customs, and evoked the supernatural, as the natural was less understood [9]. According to Rhodes [9], this draws a parallel with the duties of the modern day doctor, priest, and lawyer in understanding the natural, the supernatural, and the relationships between members of society. Modern medicine has progressed from the ancient belief in demons, planetary movements, and witchcraft, to a different level of scientific understanding [10] of the aetiology of diseases. Notwithstanding, mysticism remains enshrined among several indigenous groups, where perhaps, its effectiveness in the management of less threatening symptoms has convinced the populace of its miraculous healing powers. Modern-day physicians would, usually, dismiss any such positive outcomes from antiquated treatments as occurring due to a placebo effect. Moreover, there is a danger of such beliefs adding to major public health problems by preventing the ailing from accessing any available current treatments, which are known to be effective. This was noted in the spread of HIV/AIDS in Africa to epidemic proportions, despite attempts by global organisations to halt the spread by providing appropriate pharmacological treatments [11]; some natives rejected the modern management, and continued with traditional ineffective treatments besides high-risk behaviour.

During the advancement from primitive to current-day thinking, observation, physical examination, diagnosis, prescription treatment, and prognosis evolved gradually. Ancient medical schools of thinking related to Egypt, Mesopotamia, India, and China, along with Greek/Roman beliefs [12–18], were extant. Some medical schools propagated beliefs that would be considered similar to the concepts that define comprehensive psychosomatic healthcare. These centres of learning recognised the contributions of psychological and social aspects along with the biological, in the aetiology, presentations, and management of diseases. Scholarly learning under medical teachers, even in the days of yore, promoted an expansive curriculum in these schools whether Galenic, Ayurvedic, or Chinese [19]. Traditional methods of addressing disease in a holistic manner were taught to students who attended these institutions. Though similar to modern-day thinking with regards to many therapeutic principles, various concepts regarding disease management, which were taught at these ancient medical schools could be at variance with prevailing medical viewpoints. Accordingly, certain forms of management advocated at the time would be unacceptable to many modern-day patients. Even so, there remains interest in specific methods of treatment that are still applicable to today's diseases in a complementary form, thereby validating their continuing usefulness in healthcare provision. Some of these clinical practices have gained patient acceptance in various pockets of the world, and have been integrated into allopathic management or used as complementary treatment.

Ancient medical practices in Egypt, Mesopotamia, India, and China

Ancient medical practice in these countries gave the formative touch to the identification and treatment of diseases, and set a trend for current forms of medical management. This was despite the fact that ancient medical practitioners did not have the current medical gadgetry for assessments; the main appraisal methods that they used were observation and clinical examination.

Logic and rationality in patient management were developed in Egypt and Mesopotamia (second millennium BC) along with an understanding of the aetiology of ailments [12,20]. English translations of the available medical text however, do not give specific details of management of women's illnesses, other than that in the Kahun *Gynaecological Papyrus* [20]. It alludes to women's

problems, albeit concisely, as for example, '*Preventing acute pains of a woman*. […] *beans, grind with* […] […] *her* (?) *at her molars* (?) *the day she gives birth* [*This is*] *an effective* (*way*)'. There is missing language that hampers continuity in these ancient texts, and it has little in the way of treatments that can be applied today. At that time, magic was a part of medicine and amulets were worn when women went into labour; a practice prevalent in certain communities even today. Medicine was specialised, and specialists in every organ system were available, other than in the diseases of women, for such diseases fell within the domain of 'midwives' so were not mentioned in most medical texts.

During 600 BCE [13], the Indian School of medical thinking spread knowledge that had been compiled from the ancient Indian text of the *Atharvaveda*. It was propagated in the *Samhité* (writings) of Charaka and Sushruta, which introduced a more modern version of medical care used for the treatment of diseases prevalent at the time. This replaced the more antiquated form of management of women's diseases that was practised during the Iron Age. These schools advocated life-long learning, and developed a scientific classification of various disease conditions. Proponents believed that health and disease were not predetermined, and that if certain methods of health promotion were practised, longevity could be prolonged. The teaching of embryology was a part of training in obstetrics and paediatrics, while the learning of physiology and pathology was essential for understanding all clinical disciplines, including surgery and medicine [13–15]. These recommendations for advancing positive health, and providing appropriate treatment are included in the compendiums of Charaka and Sushruta. There are sections dealing with gynaecology and obstetrics, including managing obstetric emergencies such as 'fits', and carrying out caesarean delivery [13,15], as well as the treatment of postpartum depression [13]. An ancient form of medicine that evolved from the Vedas, Ayurveda, is still practised in India, although very selectively; some practitioners of allopathic medicine include it as part of an integrated management strategy. Further research is needed to evaluate its clinical applications. The Buddhist philosophy of health promotion and preventing disease also started in ancient India and is still followed by its proponents living in India, although such practise has advocates worldwide [1].

Traditional Chinese Medicine was similar to ancient Indian Medicine in aiming to treat the mind, body, and spirit [21]; this holistic approach towards health had also been practised by indigenous peoples worldwide. A considerable part of traditional Chinese medicine (twentieth–seventh centuries BC) was based on 'Taoism' [17], which refers to the harmony of the individual with everything, including the environment, in order to maintain health. The foundation text, *Huangdi Neijing*, includes the treatment of various diseases, including those of women by using herbs and acupuncture. Sometimes moxibustion, where heat is applied to specific points of the body to promote symptomatic relief or cure, was used. Chinese medicine spread to Japan and Korea, and influenced their healthcare provision. Although these methods are still practised in these countries, there is limited usage of these techniques in the West [22], where it is usually introduced in an integrated or complementary fashion. An evidence-based framework is needed to assess health outcomes using these methods, which can have adverse effects leading to morbidities that could be fatal. Hence, unregulated practice is not considered as appropriate, notably in the West.

Despite self-regulation of these complementary forms of medical treatment, statutory regulation under the Health Act has been considered as desirable in the UK [23]. This however, has aroused controversy [24,25]. Patients can be misled where unscrupulous health practitioners promoting these alternative forms of therapy appear convincing, and prevent access to other effective treatments, particularly for diseases where delay could be harmful as with rapidly progressive malignancies. Therefore, regulation of their practice has been recommended in several countries, including the UK.

Ancient Greco-Roman and European medical practice

Greco-Roman medicine set the investigative format for studying disease, and such a concept remains incorporated in current Western medical thinking. Ancient Greece had its first recorded medical school in 700 BC [26], where they taught about balancing humours when curing diseases. Above and beyond the network of physicians who cared for the ill at religious sites, there were shrines to the healer God, Asclepius, Apollo's son (considered to be the first physician). Appointed spiritual healers were on-site. These healers provided treatment, both surgical and non-surgical, in order to reduce symptoms or cure illnesses. Many symptoms and signs of diseases were observed and documented by practising physicians during the time of the ancient Greek philosopher/scientist healer, Aristotle, who wrote about anatomy, injury, and diseases observed in the pre-Hippocratic era [27]. This era was followed by records of health-related practice by physicians with a philosophical mindset that was established in the Hippocratic era [26,28,29]. Hippocrates and his followers endorsed a rational, non-religious, albeit holistic, approach, which emphasised the individualisation of patient care. The physician, Hippocrates of Cos (460–*c*.370 BC), who is regarded as the 'father of modern medicine' practised at the time [26]; he, along with his followers, pursued a deductive framework in understanding diseases through clinical observation, diagnosis, and prognosis that was unrelated to divine causes. These teachings were integrated in the treatises of *The Hippocratic Corpus* [28]. Another fine document, 'The Hippocratic Oath', laid down at the time is still of relevance today [29]; its tenets are consolidated in many of today's medical schools to guide in promoting ethical patient care. Selected accounts of management of women's diseases in Greece can be found later in this chapter. This reveals the keen observation and logical approach in the appraisal and treatment of diseases, which was followed by Greek physicians when their advice was sought. Good clinical practise even today includes applying such methods when providing appropriate treatment to patients.

Greco-Roman medicine was secular and naturalistic besides being holistic [30]. It emphasised the belief that 'animal spirits' and superfine fluids mediated between the body and the mind. It postulated that various 'souls' governed the body and the mind. Greek medicine at the time asserted that illness was caused largely by internal factors, rather than external factors, such as invading pathogens. Pathogens of course were undetectable until the microscope was invented in the eighteenth century. Moreover, many practitioners of ancient Greek medicine believed that all aspects were interlinked, so that the illness of the body affected the mind, which then produced symptoms such as fever, with accompanying delirium; this recognition of mind–body interaction was akin to the term 'psychosomatic' used in much later medical terminology. The person-centred approach practised at the time emphasised that, 'the right frame of mind, composure, control of the passions and suitable lifestyle could surmount sickness' or prevent it; healthy minds promoted healthy bodies. Despite considerable loss of ancient documented material due to natural disasters or destruction by marauding invaders during wars, there remains some evidence of their contributions to medical practice, in the English translations of their commonly followed advice on women's health.

A discussion of relevance from the observations and writings of Soranus [31,32] who advocated use of a birthing chair in labour, carried out podalic version when the baby had a transverse lie, and wrote about the clinical and physiological aspects of women's health and disease, follows.

Soranus: an ancient Greek authority on women's health

Soranus was born in Ephesus in Asia Minor in the second half of the first century AD. He wrote extensively on biological and the medical sciences, including gynaecology [33], internal medicine, surgery, hygiene, ophthalmology, medical history, and the prevalent anatomical nomenclatures,

besides fertilisation and embryology. His philosophy pertained to the 'Methodist' beliefs that the physician needed a more secure knowledge than that learnt solely by experience. Such knowledge could be acquired from studying the diseases themselves. He recognised that one form of treatment was needed for acute diseases, another for chronic diseases, and a third method for patients already on the way to recovery [32]. He was considered the most outstanding practitioner of his sect. In his treatises on gynaecology, he presented ancient gynaecological and obstetric practice at its height. Sadly, his work barely survived unforeseen natural and human catastrophes.

As of now, differing views about termination of pregnancy existed at the time. Soranus believed in providing contraception, and only accepted a medical indication for abortion as, according to him, medicine should 'guard and preserve what has been engendered by nature'. He described the management of diverse gynaecological presentations from menstrual irregularities to convulsions associated with 'hysterical suffocation' (currently termed 'non-epileptic fits'). Soranus' teachings influenced both the West and the East well into the sixteenth century, with Paul of Aegina translating it into Arabic. Greek medicine was dependent on Soranus' contribution. The 'doxographic' part of his writings were used by Greek and Latin authors, and his explanations of anatomical and medical terms were used later by Greek etymologists. His writings regarding healthcare provision at the time included a catechism for midwives, as well as his extensive text on gynaecology. Among other observations, Soranus described the qualities of the ideal midwife or wet-nurse who were associated with deliveries and feeding the baby, respectively. For example, he maintained the ideal midwife would be one who is free from superstition, literate, and has her wits about her, besides having short nails, is always sober, etc. He was analytical in his writings, and a proportion of his observations would be acceptable in today's medical practice. Soranus' gynaecology is compiled into four books. He assiduously divided them into normal menstruation, conception, and child-bearing/delivery (Book I); normal labour/puerperium, and baby care (Book II); abnormal gynaecology (Book III); followed by abnormal labour and management of malpositions (Book IV). In Book IV, Soranus also discusses the management of combined obstetric/gynaecological conditions that remain of relevance in today's clinical practice.

In Book I of his *Gynecology* [33], Soranus first addresses the anatomical relationships of the pelvic organs. He documents that the uterus and vagina lie between the bladder and urethra in front, and the anus, sphincters, and the rectum, behind; this concurs with current knowledge. Soranus noted that puberty usually started at 14 years of age with the onset of menstruation, which stopped around 50 years of age. Nevertheless, periods could stop earlier at 40 years of age or persist until the age of 60 years. Normal monthly menstrual cycles occurred in the majority but amenorrhea or excessive bleeding could occur. During menstruation and just prior to it, passive exercises, easy walking, and massages were advised, for this relaxed both the body and the 'soul'. These conservative measures would have helped in alleviating any dysmenorrhoea. Thus, more invasive measures for the relief of menstrual pain would have been avoided; medical oophorectomy or aggressive pelvic surgery, currently being offered as options for dysmenorrhoea (see Chapter 7) were not undertaken by the ancient Greeks; it would not have conformed to Soranus' principle of conserving the uterus that was normal. Advice about having a relationship was also provided with instructions to have consummation only after the onset of the menarche. Pregnancy was encouraged as a duty towards propagation of the human race. It was known that 'dumb' animals could only mate at certain times, whereas humans had no such restriction, though it was believed that fertility was higher at certain phases of the menstrual cycle in human females. This is widely recognised even now, and has been corroborated in current textbooks on human physiology [37].

Soranus also discoursed about the suitable time for conceiving or 'fruitful intercourse'. It was not when the body was 'too congested and heavy from drunkenness and indigestion', namely when the woman had overindulged, but when 'a pleasant state exists in every respect' after 'the

body has been rubbed down and a little food has been eaten'. This would be sensible advice in planning a pregnancy, and is appropriate, even today. Advice for a successful conception included not trying during menstruation, as logically, '*the stomach when overburdened with some kind of material and turned by nausea is disposed to vomit what oppresses it and is averse to receiving food, so according to the same principle, the uterus being congested at the time of menstruation is well adapted to the evacuation of the blood which has flowed into it, but is unfitted for the reception and retention of the seed*'. Other logical comparisons followed about 'retaining the seed' after the first missed period when, '*one must beware of every excess and change, both bodily and psychic*'. Advice for a successful conception also included attention to both physical and mental health by, preventing falls, blows and drunkenness, not catching fever with rigors, avoiding fright, sorrow, severe mental upset, not riding in a chair drawn by animals that cause 'violent shaking', etc. Importance to nutrition during pregnancy included taking neutral, non-fatty foods such as fresh fish and vegetables, and avoiding pungent food such as garlic/onions, preserved fish/meat, etc. Rest and suitable diet in the early months included eating food that was 'easy to digest' and 'good for the stomach' such as a porridge made of barley or rice, which also helped with nausea/vomiting that could cause undernourishment, constipation, and pica. Pica was recognised as an 'appetite for things not customary' such as earth, charcoal, unripe and acid fruit, etc., an appetite which could occur in the first four months of pregnancy but uncommonly could persist beyond this period. In-keeping with current observations, it was noted that with a normal pregnancy the start and the end could be times for any concern but generally, 'the interval between these times' was the time when the pregnancy was most stable.

The main topics in Book II included preparation for normal labour, and the puerperium along with managing the baby and the infant; many of their principles of management are similar to current advice for managing normal labour. At the time, arrangements were made for a birthing chair for the parturient when she was in labour, and for the attendance of a midwife and three helpers. The aim was to keep the labouring woman 'calm' and 'give her no cause for concern'. The three helpers surrounded the woman labouring in a birthing chair, and the midwife knelt facing her looking at her face but not 'gaze steadfastly' at the introitus, so that the labouring woman was not 'ashamed' and 'become contracted'. The midwife had to assure the woman that there was 'nothing to fear' and not to 'scream' but to 'groan' during her pains. At the time of delivery, the labouring woman was advised to 'strain' when pains were present. Pledgets were placed for support to prevent rupture of the perineum and prolapse of the anus when delivering; this seems similar to the current principle of guarding the perineum when the baby is being delivered to reduce the risk of perineal tears. The midwife would anoint her hands with warm olive oil, and then cover her hands with cloth (in Egypt, with papyrus) to receive the baby; she waited for the 'secundines' (the placenta with membranes) to deliver. Sitz baths, sponging and oil massage were used for soothing the body, and breast-care was given for initiating breast-feeding, which included applying emollients, unless the mother decided to employ a wet-nurse. Detailed advice for breast-feeding or wet-nurse support, and managing the baby and infant is addressed in the rest of Book II. The ancient Greek practice of team-work to give the labouring woman confidence to try and achieve a normal delivery has stood the test of time; it has gained wide attention in recent years, particularly in the West.

At the start of Book III, Soranus mentions that women have 'diseases of their own' other than those related to pregnancy, and that some physicians known as 'women's physicians' (current-day gynaecologists) look after these problems. He discourses about taking an 'interview' (similar to today's history-taking), and the importance of documenting the age of the woman when formulating a diagnosis. Gynaecological problems discussed are related to amenorrhoea, dysmenorrhoea, heavy vaginal bleeding, miscarriage, carneous mole, abortion, fits, tumours of the

uterus, probable pyometra, and postmenopausal bleeding. Among these discussions, is evident his advice about managing 'retention of the menstrual flux' (today's 'amenorrhoea'), his thoroughness in reaching a diagnosis (his clinical acumen), and directives about providing tailored care. At the start, he qualifies the complaint by noting the difference between 'not to menstruate' as common to 'physiological states' when women were 'too young or too old', as 'it is absurd to talk about retention of the menses, where there is nothing to be menstruated', and the other condition he terms 'retention of the menstrual flux' (both conditions are currently referred to as 'amenorrhoea'). He then takes into account the clinical history and appearance of the patient. He observes that absence of menses could be due to: being too young (pre-menarche) or too old (post-menopausal), or being pregnant; being an athlete or 'mannish', for in these women 'everything is being consumed by the exercises'; having an imperforate hymen; closure of the orifice (possibly cervix) from 'long widowhood amongst other causes'; 'undernourishment' and 'great emaciation' (today's anorexia nervosa), or 'accumulation of fatty flesh' (today's obesity with possible polycystic ovarian syndrome). He deliberates about carrying out a 'differential diagnosis' to arrive at the correct diagnosis, and then providing the appropriate care. For instance, if the amenorrhoea was 'physiological' (pregnancy, age-related), no treatment would be required; if the woman was underweight and desiring a pregnancy, as with athletes, 'one must make them live more genteelly by restricting their active mode of life so that their bodies become more feminine'. He cautions against treatment of physiological amenorrhoea by using his logic, as 'one should not treat those without disease for whom it is physiological not to menstruate' for 'if the pathological state is the opposite of the physiological, the physiological if changed into its opposite necessarily becomes pathological', indicating his clinical approach to prevent unnecessary treatment. Conversely, if they had an 'ailment' it had to be treated. He advises incision for an imperforate hymen, and soothing poultices with rest in a darkened room, along with encouragement to relax/sleep for alleviating the pain (today's 'dysmenorrhoea') associated with 'partial retention' of menstrual flux. More aggressive treatment was offered infrequently to women with amenorrhoea who did not respond to other conservative measures. These included applying a 'leech' or venesection with blood-letting, followed by a schedule for recuperating from these measures; these would be inadvisable in modern times. Some of his text is missing from this section of the book. Again, his writings about hysterical fits or a probable pyometra show remarkable clinical sense, besides logic.

Soranus alludes to the woman's presentation of fits as 'hysterical suffocation', and his description of the condition is analogous to that labelled as 'non-epileptic fits' (see Chapter 4) in modern terminology. He observed that most of these patients gave a previous history of unsatisfactory life events such as, 'recurrent miscarriages, premature birth, long widowhood, retention of menstruation, the end of ordinary childbearing', etc. He mentions that sufferers usually, 'collapse, show aphonia, laboured breathing, a seizure of the senses, clenching of the teeth, stridor, convulsions, contraction of the extremities (but sometimes, weakness) and bulging of the network of vessels of the face'. On examination the body was 'cool', covered with perspiration and the pulse was small or absent. The majority 'recover quickly from the collapse, and usually recall what has happened; the head and tendons ache and sometimes they are even deranged'. In the differential diagnosis, he mentions that because of the 'seizure' and 'aphonia', the presentation would relate to epilepsy, apoplexy, catalepsy, lethargy due to high fever, or aphonia caused by worms. Among the characteristics fitting with non-epileptic seizures were that these women could recall what had happened once the paroxysm was over, which was not the case with other forms of seizures. Soranus continues on giving further details of the differential diagnosis before confirming the diagnosis of hysterical suffocation (based solely on clinical expertise). He further describes the management for a good recovery that includes 'sponging the face' for a 'vitalising effect', rubbing sweet olive oil on the extremities, swathing with wool, hot sitz baths, suppositories if constipated,

etc. He also compares his treatment with that of some of his contemporaries who would advise, to 'shout loudly' near the patient, 'blow vinegar into her nose', give 'toxic pungent potions', make a 'noise with metal plates', etc. Soranus considered their methods unseemly, and comments that making loud noises with metal plates would 'give headaches to healthy persons', and that vinegar blown in was harmful as it was an astringent, and would cause internal inflammation. He seemed compassionate, and strongly felt that patients should not be given those treatments meted out by these colleagues. For those with more frequent attacks, Soranus recommends gradually increasing to more intensive treatments, such as various passive exercises, reading aloud, vocal exercises, swinging in a hammock, gymnastics, and travelling on sea or land. Greater attention seemed to have improved/cured hysterical suffocation, and still has a place for today's patients with non-epileptic fits (see Chapter 4).

Moving on to Book IV, Soranus discusses problems during labour, including dystocia and malpresentations. He again divides the topics into sections with descriptive subtitles such as, 'How in general to treat difficult labour, and the detailed care of difficult labour'. He describes successes with vaginal breech delivery, pushing in the prolapsed hand presentation followed by manipulation to a cephalic presentation and then vaginal delivery, carrying out podalic version to change to a cephalic presentation and then delivering vaginally, besides the delivery of twin pregnancies. He describes the management of retained placenta after vaginal delivery and cautions about pulling hard on the cord, lest it results in a uterine inversion. If the placenta remains attached firmly, he advises to wait for its separation, and then to deliver it. Such advice is of relevance even today. He also describes acute inversion of the uterus, and how to restore it back to its position immediately. Chronic uterine prolapse of various degrees and its management is also described. He considered it worth mentioning that uterine prolapse occurs when the patient is despondent and under mental stress. However, this could be just a chance occurrence with other concomitant causative factors responsible for the psychological symptoms, or despondency could have followed the prolapse; recent literature confirms an association of uterovaginal prolapse with impaired quality-of-life [34]. Soranus also mentions about destructive procedures that had to be carried out sometimes to deliver a dead baby; this continues to be carried out occasionally, usually in low-resource settings. A large section of Soranus' writing is missing from Book IV. Lack of imaging, blood/fluid resuscitation or antibiotics besides inadequate analgesia or recourse to operative deliveries would have made management in ancient Greece more hazardous. Notwithstanding, careful individualised assessment along with logic overcame many clinical challenges. Good history-taking and clinical observations along with rational thinking, and holistic attention, are also useful assets for providing modern-day healthcare.

Greek medicine influenced Roman medicine, which had progressed steadily while maintaining exchanges with an advanced Egyptian medical care system. However, this practice declined with the fall of the Roman Empire when such knowledge remained localised as folk medicine. During the Middle Ages, medicine progressed in Persia, which was geographically located between Greece and India, and so was influenced by the practice in these neighbouring countries. The learning and practice of scientific medicine continued to evolve concomitantly in Persia. A Muslim scholar in Córdoba, Abū al-Qāsim, wrote a medical encyclopaedia, *Kitab al-Tasrif*, which was used in Muslim and European medical schools even in the seventeenth century [35]. Professional medicine in Europe (Christian, Islamic, and Jewish) had splintered during the medieval period. Nonetheless, there was social involvement, and doctors generally believed in a strong link between physical and mental well-being, whereby they paid attention to the psychological state even when one had a fever [36]. Childbirth was particularly hazardous [35], with many women not surviving certain complications when giving birth. The poor rarely lived beyond 30 years of age.

Medicine began to be re-organised in Europe during the eleventh century, with the opening of the medical school, the *Schola Medica Salernitana*, in Salerno along the Italian coast [35]. It

included, among its faculty, experts of Greek and Muslim medicine, along with the Latin medical scholars. In 1530, the Belgian physician, Andreas Vesalius, translated preserved Greek medical texts into Latin. Women's health topics such as infertility, childbirth, and menstrual problems, along with associated psychological and social issues, were dealt with by physicians and midwives from these regions. In the eighteenth century, disease management in Europe began to be dichotomised, with priests becoming more involved in tending to the salvation of the soul, whereas physicians dealt with the ailments of the body. Pre-industrialised Europe mirrored tribal societies in their belief that the devil and his minions would wreak evil, so if someone fell ill without an obvious cause, accusations of malice could follow. For example, when symptoms of fits, vomiting, confused speech or delirium presented, they had to be explained by being attributed to disease, fraud or demonic power. Religious and medical experts did not always concur [36], and while the Catholic priests accused the supposed female perpetrator of disease as practising witchcraft, the Anglican bishops were happy to pass on these cases of possession to the doctors. In the long-run, the ruling European elite were terrified of the anarchy of witchcraft so 'medicalised' the 'demonism'. It is beyond the scope of this chapter to discuss all previous practices. The aetiopathology of the neuroendocrine dysfunction that generates symptoms of psychosomatic dissonance, and the scientific progression towards effective management of such clinical manifestations is examined next.

The rationale behind developing psychosomatic awareness in healthcare

Although psychosomatic diseases can cause considerable morbidity, the understanding of their causation is relatively less advanced when compared with diseases that are attributed solely to biological aetiologies. This was probably due to the fact that by promoting research and improved understanding of the biological aetiopathological factors associated with diseases, as in infection or inflammation, their identification, and specific treatment has been established by the practitioners of allopathic medicine. Exemplars of a solely biological management are the effective treatment of fever and pain from a urinary tract infection with a microbe-sensitive antibiotic or that due to appendicitis by surgical removal of the inflamed organ. Medical professionals who are only familiar with the biomedical treatment strategy are flummoxed when this management technique cannot be applied universally to all clinical scenarios. This is particularly relevant to the management of psychosomatic conditions, which may need a different perspective than that routinely used in most health facilities for the evaluation of presenting symptoms, and for guiding the treatment indicated.

Non-recognition or underestimating the repercussions of psychosomatic illness by a proportion of the medical workforce understates the need for its satisfactory management to reduce associated morbidity. Such morbidity has been adding to the prevailing disease burden, and impacts severely on the quality-of-life of both civilian and war veterans [6,1], besides draining global healthcare resources. Moreover, if one recalls knowledge from one's medical undergraduate days, when connections between the mind and the body were elaborated while studying basic sciences, a contrary concept promoted when starting clinical practice that denies a mind–body link in health or disease, seems counterproductive for providing effective health care.

Structural and functional basis of psychosomatic health/illness

Psychosomatic health/illness involves the organ/systems of the mind; both the central and peripheral nervous systems, along with any other organ/systems that they are connected with

via neuroendocrinological messengers. The current scientific basis of clinical psychosomatic understanding that is of relevance to the topics discussed in this book is further deliberated upon in the following pages. It starts with illustrations of certain areas in the brain that are involved (Figures 1.1–1.4), namely the cerebral cortex and the limbic system.

Embryological/neuroendocrinological correlates of psychosomatic pathophysiology

Embryologically, the brain and the genital organs develop concurrently. Animal studies have revealed that very early exposure to androgens would convert the hypothalamus into the male model of endocrinological control. As such, messages from the hypothalamus would regulate a continuous release of gonadotrophins from the pituitary gland [37]. If however, the fetus is not exposed to androgens early in development, the female model of the hypothalamopituitary axis develops, thereby initiating a cyclical release of gonadotrophins at puberty that regulate menstrual cycles, and maintain the normal neuroendocrinological milieu. The higher centres in the brain interact with the hypothalamus (Figures 1.1, 1.2, 1.4,), which in turn sends messages to stimulate the pituitary gland to initiate ovulation during menstrual cycles. This leads to the cascade of hormonal effects that cause the gynaecological, physical, and behavioural changes (Table 1.1) of puberty [38,39]. The hypothalamus is also considered to be a part of the limbic system (Figures 1.1, 1.4–1.6) that participates in the genesis of emotions [40], which are related to human behaviour. These include the motivation for accomplishing a task, self-preservation, insight, and judgement. The limbic system broadly consists of the hypothalamus, amygdalae, hippocampus, uncus, parahippocampal gyrus, para-olfactory area, the fornix, and the mammillary bodies (Figures 1.4–1.6).

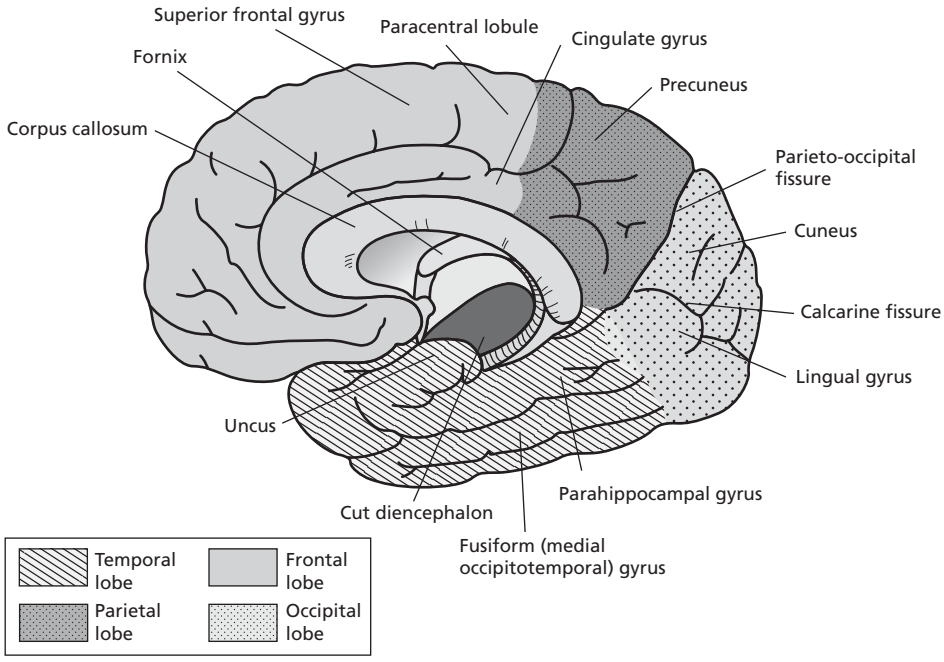

Figure 1.1 Medial view of the right cerebral hemisphere with part of the limbic system (fornix, parahippocampal gyrus, diencephalon).

Waxman SG ed. Clinical Neuroanatomy. 26th edition. McGraw-Hill Companies, Medical. 2010. p 134

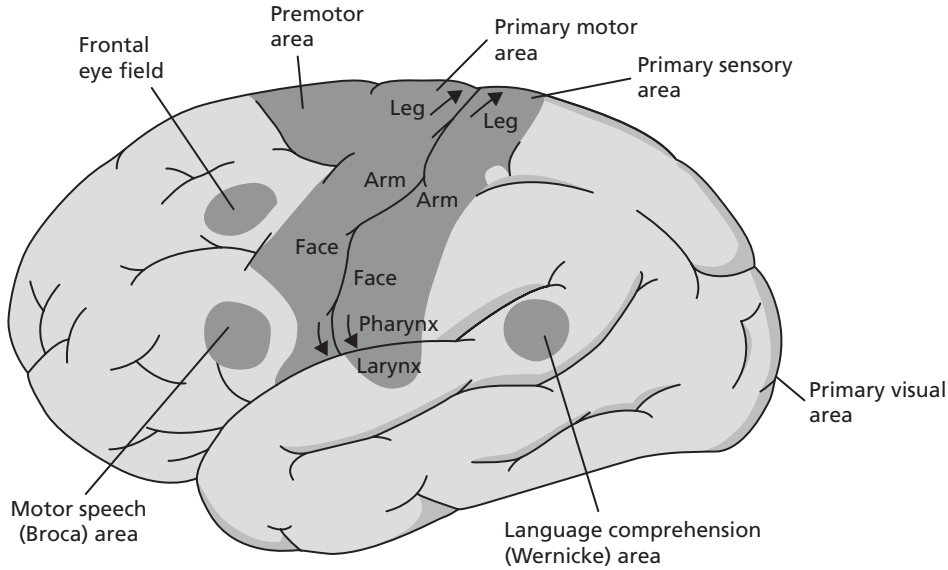

Figure 1.2 Lateral view of the left cerebral hemisphere showing the primary motor area in the parietal sulcus and the primary somatosensory area behind it.

Waxman SG ed. Clinical Neuroanatomy. 26th edition. McGraw-Hill Companies, Medical. 2010. p 139

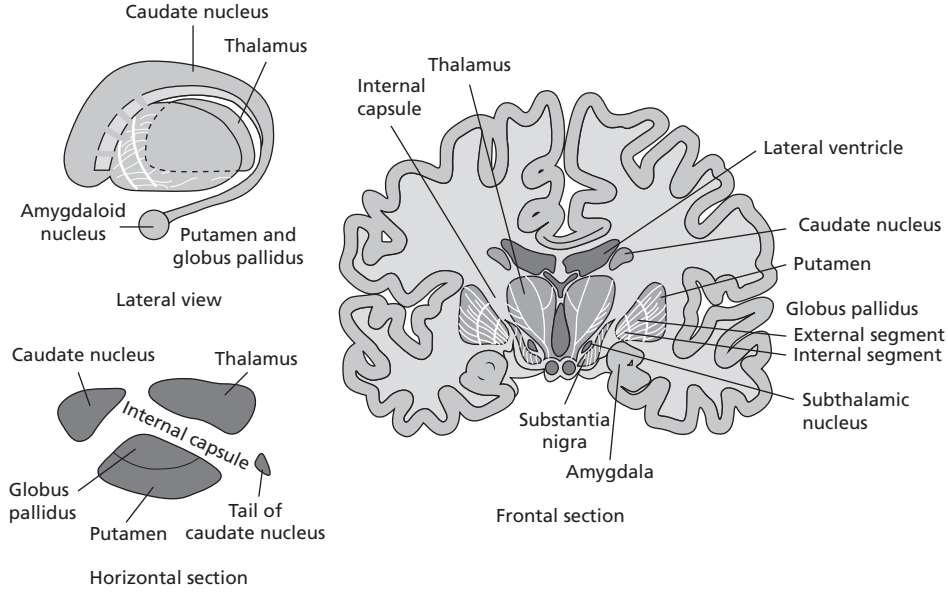

Figure 1.3 The basal ganglia (caudate nucleus, globus pallidus, amygdaloid nucleus, putamen), the thalamus, and their surrounding structures (frontal/coronal section).

Ganong's Medical Physiology. eds. Barrett, Barman, Boitano, Brooks, 25th edition McGraw-Hill, Education, Lange. 2016. p 244

Table 1.1 Hypothalamic function, human behaviour/emotions and regulatory mechanisms

Function	Afferents from	Integrating areas
Temperature regulation	Cutaneous cold receptors; temperature-sensitive cells in hypothalamus	Anterior hypothalamus (response to heat), posterior hypothalamus (response to cold)
Neuroendocrine control of catecholamines	Emotional stimuli, probably via limbic system	Dorsomedial and posterior hypothalamus
Vasopressin	Osmoreceptors, volume receptors, others	Supraoptic and paraventricular nuclei
Oxytocin	Touch receptors in breast, uterus, genitalia	Supraoptic and paraventricular nuclei
Thyroid-stimulating hormone (thyrotropin, TSH) via thyrotropin-stimulating hormone (TRH)	Temperature receptors, perhaps others	Dorsomedial nuclei and neighbouring areas
Adrenocorticotropic hormone (ACTH) and β-lipotropin (β-LPH) via corticotropin-releasing hormone (CRH)	Limbic system (emotional stimuli); reticular formation ('systemic' stimuli); hypothalamic, or anterior pituitary cells sensitive to circulating blood cortisol level; suprachiasmatic nuclei (diurnal rhythm)	Paraventricular nuclei
Follicle-stimulating hormone (FSH) and luteinising hormone (LH) via luteinising-hormone-releasing hormone (LHRH)	Hypothalamic cells sensitive to oestrogens; eyes, touch receptors in skin and genitalia	Preoptic area, other areas
Prolactin via prolactin-inhibiting hormone (PIH) and prolactin-releasing hormone (PRH)	Touch receptors in breasts; other unknown receptors	Arcuate nucleus, other areas (hypothalamus inhibits secretion)
Growth hormone via somatostatin and growth-hormone-releasing hormone (GRH)	Unknown receptors	Periventricular nucleus, arcuate nucleus
'Appetitive' behaviour:Thirst	Osmoreceptors, subfornical organ	Lateral superior hypothalamus
Hunger	'Glucostat' cells sensitive to rate of glucose utilisation	Ventromedial satiety centre, lateral hunger centre; also limbic components
Sexual behaviour	Cells sensitive to circulating oestrogen and androgen, others	Anterior ventral hypothalamus plus (in the male) piriform cortex
Defensive reactions:fear, rage	Sense organs and neocortex, paths unknown	In the limbic system and hypothalamus
Control of various endocrine and activity rhythms	Retina via retinohypothalamic fibres	Suprachiasmatic nuclei

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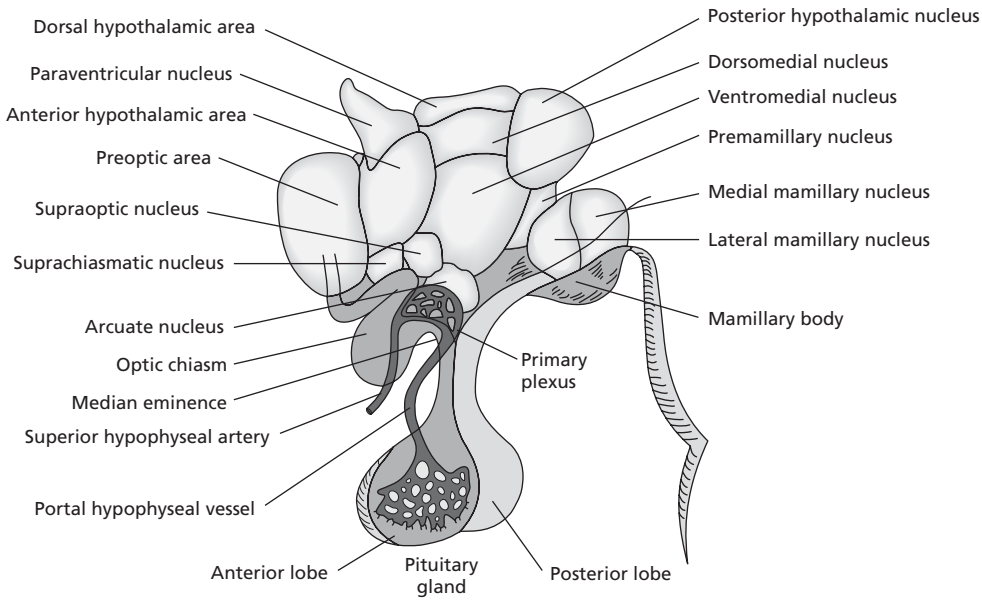

Figure 1.4 The hypothalamus, anterior and posterior pituitary with superimposed portal-hypophyseal vessels.

Waxman SG. ed. Clinical Neuroanatomy. 26th edition. McGraw-Hill Companies, Medical. 2010. p 124

They relate to the emotions of anxiety, fear, mood, anger, reward, punishment, social and sexual behaviour, which are expressed in response to personal and social stimuli.

The limbic system is connected with the higher centres in the cerebral cortex (Figure 1.7), which participate in the regulation of various aspects of one's emotions, body temperature, the drive to eat, body weight, osmolality, and fluid intake. An important connection involves the Papez circuit (Figure 1.6), which consists of fibres that connect the hippocampal gyrus with the hippocampus, the fornix, mammillary bodies, anterior thalamic nuclei, the cingulate gyrus, and then back to the hippocampal gyrus [41]. A number of cortical areas feed into it. Its importance lies in the fact that it ties together cognition (cortical) activities with emotional experience and expression. Hence, stimulation of the limbic system, 'a multimodal association system', can generate autonomic responses [41] from the gastrointestinal and cardiovascular systems, effect micturition and defaecation, or cause pupillary changes and piloerection. Somatic responses, such as unusual eating/drinking behaviour, personality changes from being passive to being aggressive, or alterations in memory, can also result from stimulation of the limbic system. The limbic system and the brain stem are linked by the medial forebrain bundle, and the reticular formation links the brain stem, thalamus, hypothalamus, and the basal brain [40]. The pituitary links up with its target organs (Table 1.2) both endocrinologically, as with the ovaries, and via neural pathways, as with the adrenal medulla. These pathways are also involved in modulating emotional health. The endocrinological and neurological components of this pathway regulate the physiological changes during different phases of life from puberty to the menopause. Psychosomatic manifestations are linked with emotions, and as such, are mainly addressed/illustrated in the chapters that follow (see Chapters 4,5,6,12). The anatomical, physiological and pathological mechanisms that are associated with emotions and behaviour are now further analysed.

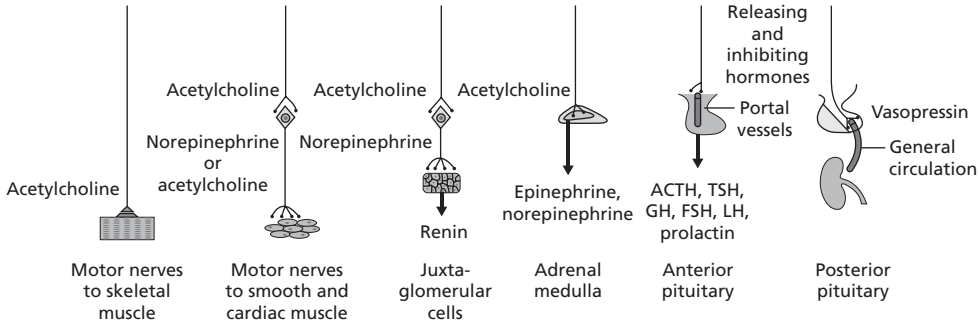

Figure 1.5 Neuroendocrinal control mechanisms (epinephrine and norepinephrine are synonyms for adrenaline and noradrenaline). In the two on the left, the neurotransmitters act on the nerve endings in muscles; in the two in the middle, neurotransmitters act on endocrine glands; in the two on the right, releasing and inhibiting hormones are released into the circulation (ACTH, adrenocorticotrophic hormone; TSH, thyroid stimulating hormone; GH, growth hormone; FSH, follicle stimulating hormone; LH, luteinising hormone).

Ganong's Review of Medical Physiology. 23e. Chapter 18. Hypothalamic regulation of hormonal functions. Figure 18-6. The McGraw-Hill Companies, Inc. 2010

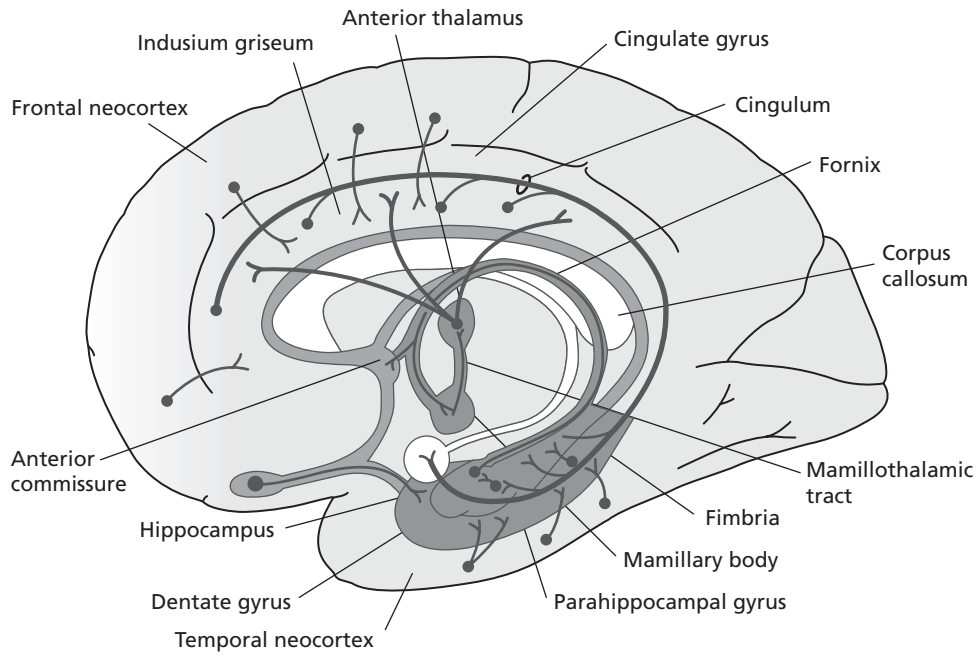

Figure 1.6 Pathways between the hippocampal formation and the diencephalon, including a loop—the Papez circuit and the neocortex. The Papez circuit is associated with emotions, expression and cognitive (cortical activities) behaviour.

Kandel ER, Schwartz JH, Jessell TM eds. Principles of Neural Science. 4 ed. McGraw-Hill 2000. p 235

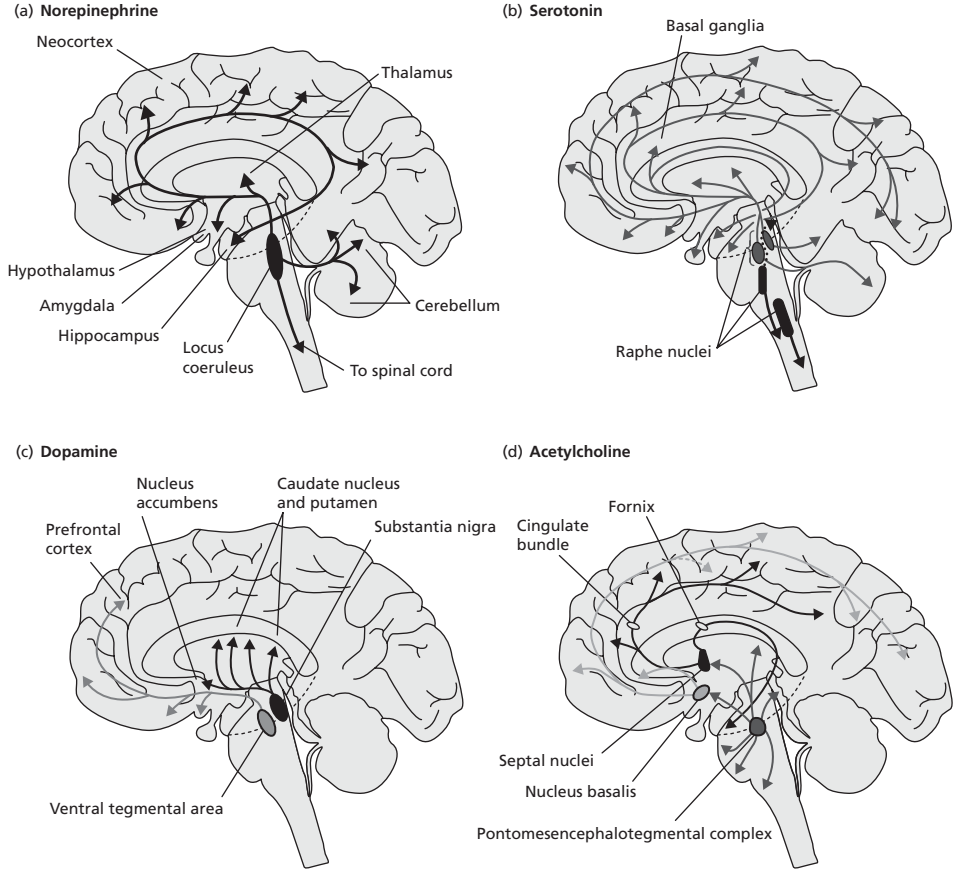

Figure 1.7 Diffusely connected systems of central neuromodulators (norepinephrine, serotonin, dopamine, acetylcholine) involving the limbic system. (a) Noradrenergic neurons in the locus coeruleus innervate the spinal cord, cerebellum, several nuclei of the hypothalamus, thalamus, basal telencephalon, and neocortex. (b) Serotonergic neurons in the raphe nuclei project to the hypothalamus, limbic system, neocortex, cerebellum and the spinal cord. (c) Dopaminergic neurons in the substantia nigra project to the stratum and those in the ventral tegmental area of the midbrain project to the prefrontal cortex of the limbic system. (d) Cholinergic neurons in the basal forebrain complex project to the hippocampus and the neocortex and those in the pontomesencephalotegmental cholinergic complex project to the dorsal thalamus and the forebrain.

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Emotions and behaviour

Among the emotions, anxiety can be regarded as a common mental condition that affects both genders, and can be modulated by relationships. It is mediated by the neurotransmitter gamma-aminobutyric acid (GABA), which acts on the $GABA_A$ receptors at ligand-gated channels (Figure 1.8) that are widely distributed in the central nervous system. Their action is associated with an increase of blood flow in the temporal lobe that leads to the clinical response of anxiety. Anxiety is considered as an appropriate response if not of an excessive degree. However, such a response is individualised, and cannot be measured accurately using the available assessment tools, especially

Table 1.2 Common neurotransmitters and their actions

Transmitter	Receptor	Second messenger*	Effect on channels	Action
Acetylcholine (Ach)	N	–	Opens Na^+ and other small ion channels	Excitatory
	M	cAMP or IP_3, DAG	Opens or closes Ca^{2+} channels	Excitatory or inhibitory
Glutamate	NMDA	–	Opens channels, which permit Ca^{2+} influx if membrane is depolarised	Senses simultaneous activity of two synaptic inputs. May trigger molecular changes that strengthen synapse (LTP)
	Kainate	–	Opens Na^+ channels	Excitatory
	AMPA	–	Opens Na^+ channels	Excitatory
	Metabotropic	IP_3, DAG	–	Excitatory raises intracellular Ca^{2+}
Dopamine	D_1	cAMP	Opens K^+ channels, closes Ca^{2+}, channels	Inhibitory
	D_2	cAMP	Opens K^+ channels, closes Ca^{2+}	Inhibitory
Gamma-aminobutyric acid (GABA)	$GABA_A$	–	Opens Cl^- channels	Inhibitory (postsynaptic)
	$GABA_B$	IP_3, DAG	Closes Ca^{2+} channels, closes K^+, channels	Inhibitory (presynaptic)
Glycine	–	–	Opens Cl^- channels	Inhibitory

* Directly linked receptors do not use second messengers.

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if it cannot categorise the patient's perception of her symptoms. Fear is another emotion, generated by stimulation of the hypothalamus and the amygdaloid nuclei with associated autonomic, and endocrine manifestations. The amygdalae also relate to the encoding of memories that evoke fear.

Rage is another emotion that is related to the amygdalae, and the lateral hypothalamus [42]. It is controlled by the neocortex and ventromedial hypothalamus with minor stimuli failing to cause any irritation when this control pathway is intact. Violence is a form of behaviour that is associated with lowered activity of the prefrontal cortex. Violence and rage may be interrelated but obtaining scientific evidence to confirm this has been problematic, as they are associated with quite complex interactions. The lateral and ventromedial nuclei of the hypothalamus along with the medial forebrain bundle are associated with reward whereas the periventricular area near the 3rd ventricle is concerned with fear and punishment. Furthermore, in certain limbic areas, such as the area surrounding the aqueduct and the 3rd ventricle, a weaker stimulation conveys a sensation of reward whereas a stronger stimulation generates the feeling of punishment. In any given situation fear and punishment take precedence over reward [42].

Anxiety and mood symptoms, also known as dysphoric symptoms [4], can be generated by stress. It is recognised that when stress is perceived, the body sets in motion responses to minimise its effect by initiating a neuroendocrine response, which can have a short- or long-term impact,

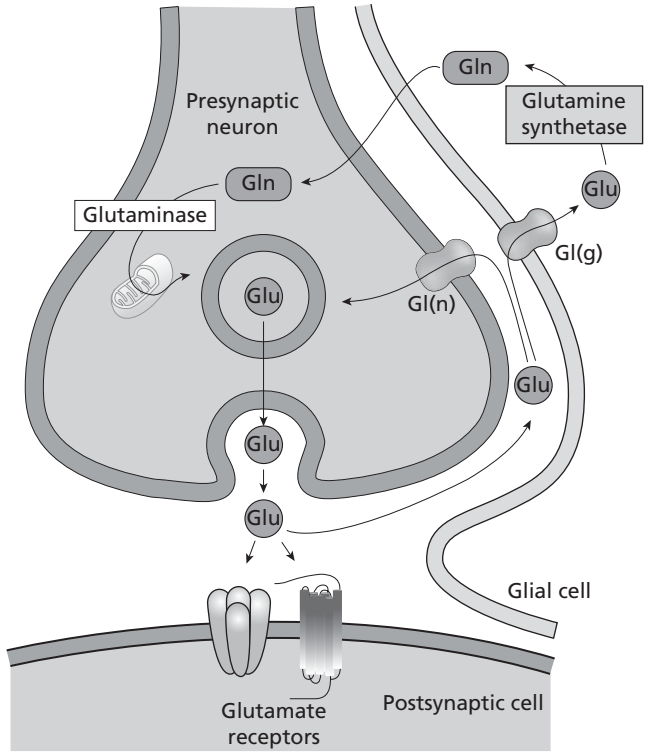

Figure 1.8 Biochemical events for neurotransmission at glutamatergic synapse. Glutamate is released into the synaptic cleft by a Ca^{+} dependent mechanism, carries out its ionotropic action, and enters the glial cell by a Na+ pump activator where it is converted to glutamine when its action terminates; it enters the nerve terminal and is converted back to glutamate to diffuses out again

Ganong's Medical Physiology. eds. Barrett, Barman, Boitano, Brooks, 25th edition. McGraw-Hill, Education, Lange. 2016. p 143

depending on the duration of the stress. The noradrenergic system, particularly the locus coeruleus in the brain stem, and the serotonergic systems are activated by stressors with the former causing a release of catecholamines (mainly noradrenaline) from the autonomic nervous system, and the latter increasing the serotonin turnover in the brain. The response of the endocrine organs to stress, follows the release of corticotropin releasing factor (CRF) from the hypothalamus, which enters the pituitary portal system (Figure 1.4). CRF acts on the anterior pituitary to release ACTH (adrenocorticotrophic hormone), followed by release of cortisol and glucocorticoids. Glucocorticoids promote energy usage. They also enhance the overall role of serotonin by the regulation of serotonin receptor function that is also related to depression and related illnesses. It is recognised that glucocorticoids may increase serotonin 5HT2 (5 hydroxytryptamine) mediated action, which have been implicated in the pathophysiology of major depression. Stress also increases the dopaminergic neurotransmission in the meso-prefontal pathways, in which amino acids and peptide neurotransmitters (Figure 1.7) are involved (Table 1.2). The locus coeruleus is also associated with certain stress-related responses such as an increase in motivation, an alteration in cognitive function, stress-induced fear-circuitry as in post-traumatic stress disorder (PTSD) (see Chapters 4,12), and an increase in working memory (excess noradrenaline) or a memory loss (reduced noradrenaline).

In addition, it is recognised that neurotransmitters are released by neurones at synaptic clefts in order to initiate their actions. They are rapidly taken back to the neuron by the process of

Table 1.3 Actions produced by stimulation of opioid receptors

Receptor	Endogenous opioid peptide affinity	Effect
μ	Endorphins > Enkephalins > Dynorphins	Supraspinal and spinal analgesia Respiratory depression Constipation Euphoria Sedation Increased secretion of growth hormone and prolactin Meiosis
κ	Enkephalins > Endorphins and Dynorphins	Supraspinal and spinal analgesia Diuresis Sedation Meiosis Dysphoria
γ	Dynorphins >> Endorphins and Enkephalins	Supraspinal and spinal analgesia

Ganong's Medical Physiology. eds. Barrett, Barman, Boitano, Brooks, 25th edition. McGraw-Hill, Education, Lange. 2015. p. 154.

reuptake, involving a Na^+ dependent membrane transporter, where their action terminates. This is of considerable importance for the neurotransmitter glutamate, which is an excitotoxin, and can cause cell death by overstimulation if its reuptake is blocked, thereby prolonging its action. While acting on the CNS receptors in the limbic system (mainly the hippocampus) and the cerebellum, glutamate acts as an ionotropic that affects memory, and also as a metabolotropic facilitator of synaptic plasticity, which affects spatial learning. Glutamate and GABA also play a part in increasing the stress response through the dopaminergic and non-adrenergic brain circuits (Figure 1.7).

ACTH and cortisol provide a negative feedback to the hypothalamic-pituitary-adrenal axis, including the suprahypothalamus-brain regions, such as the hippocampus. In addition, secretagogues such as vasopressin and oxytocin can activate the HPA axis. Adrenaline is secreted from the adrenal medulla in response to stress, which in turn activates the release of CRF. Additionally, humoral immune factors such as interleukins (IL-1) IL-6 PGLF, can be released by stress. They modify the immune responses of the stressed individual, which may be associated with bacterial/viral infection or with the action of tumour cells [43] that trigger innate immunity.

Addiction is another type of conduct that is related to biopsychosocial issues, which can compromise the individual's psychosomatic health. Illness can be initiated by alterations in the neuroendocrinological milieu caused by the addictive drugs that can modulate the neurotransmitters released from the limbic system. It can be described as behaviour that gives pleasure, and serves as an escape from discomfort. Addiction is related to the nucleus accumbens, and its connections with the meso-cortical dopaminergic neurones of the midbrain and the frontal cortex, which are concerned with the reward system. This system is stimulated when dopamine is released to act on the D3 receptors, and produce pleasurable relaxation (Table 1.3). Drugs such as cocaine, opioids, or alcohol, initiate this release of dopamine (Figure 1.9), whereby a stimulation of the reward system occurs. Consequently, there is a compulsive use of the addictive substance, despite negative health outcomes that wreck a balanced lifestyle. Unpleasant psychological and physical symptoms occur on withdrawal of the drug, which subsequently perpetuates the person's dependence on the addictive drug/s. Cravings for the addictive drugs such as opiates, which occur when it is withdrawn is mainly related to its interaction with the nucleus locus coeruleus-noradrenergic system [45]; the release of noradrenaline is also related to the relief of pain by acting at the dorsal

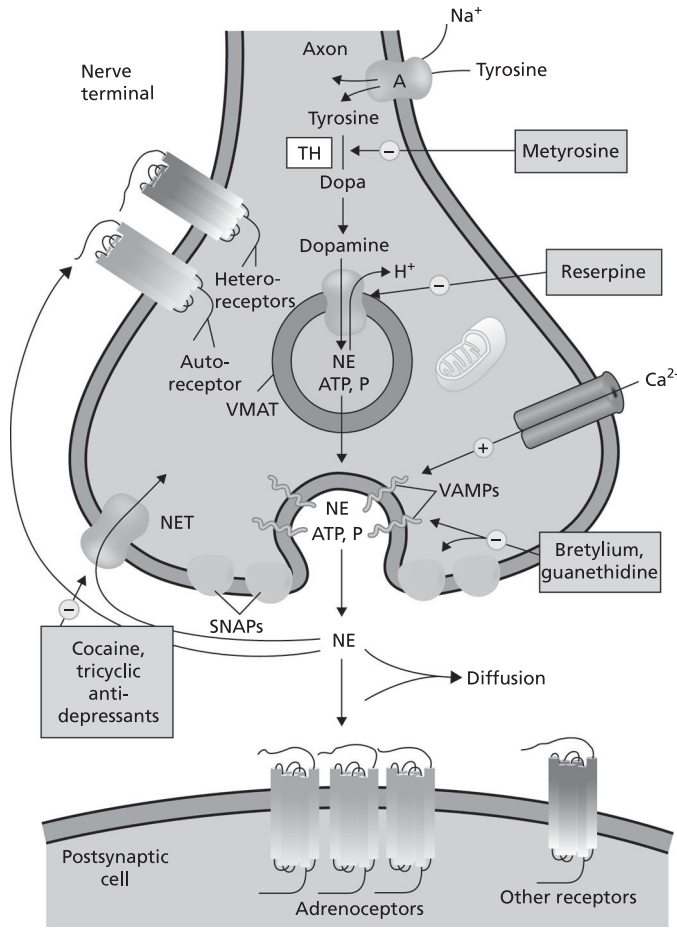

Figure 1.9 Biochemical events at a noradrenergic synapse that is blocked by cocaine. Tyrosine is converted to dopamine and then noradrenaline. Noradrenaline is transported by a noradrenaline transporter (NET) back into the neurone to terminate its action. Drugs such as cocaine and tricyclic antidepressants can block NET.

Ganong's Medical Physiology. eds. Barrett, Barman, Boitano, Brooks, 25th edition McGraw-Hill Education, Lange. 2016. p 148

horn synapses of the spinal cord, besides acting on parts of the limbic system to generate a feeling of pleasure. Addiction can be reversed by other drugs that act on the same central nervous system centres as the addictive drug, namely, methadone for opioids or disulfiram for alcohol. However, de-addiction remains a challenge for the patient and her physician, particularly if any aggravating biopsychosocial factors that led to the addiction cannot be modified; its clinical effects are illustrated in Chapter 4 (see Table 4.2 in Chapter 4).

Relapse after de-addiction may occur due to release of excitatory neurotransmitters in the brain areas concerned with memory, namely the medial frontal cortex, hippocampus, and the amygdalae. This follows exposure to sight, sounds, and situations that were previously associated with the addictive drug used by the individual concerned, and hence, specific for the individual.

The amygdalae are also associated with sexual behaviour; the neocortex along with the hypothalamus inhibit inappropriate sexual behaviour in the male. In the female, the hypothalamus relates to sexual behaviour both in humans and the non-human mammal, but unlike its human counterpart, the latter, when not under captivity, accepts the male cyclically, that is, only during

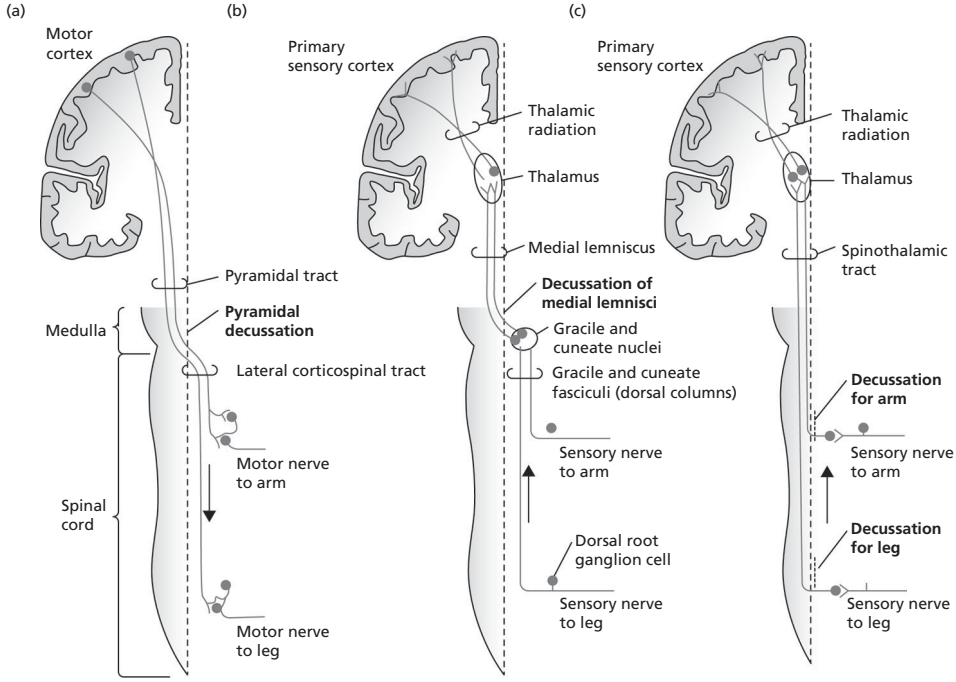

Figure 1.10 Pathways. (a) Motor (pyramidal). (b) Sensory (dorsal column system). (c) Pain (spinothalamic).

Waxman SG ed. Clinical Neuroanatomy. 26th edition. McGraw-Hill Companies, Medical, 2010. p 37

ovulation; this difference in human behaviour when compared with other mammals was also documented by Soranus [33]. Maternal behaviour is associated with the cingulate and retrospinal sections of the limbic cortex and is facilitated by prolactin, which shows a considerable rise after delivery to enable lactation and foster mothering.

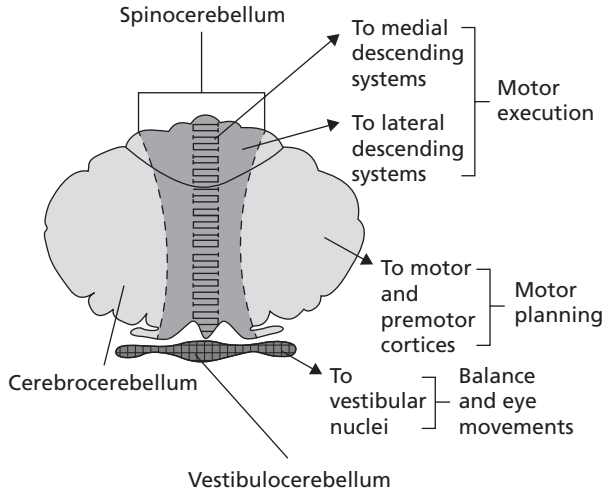

Figure 1.11 The cerebellum—motor planning and motor execution.

Kandel ER, Schwartz JH, Jessell TM eds. Principles of Neural Science. 4th ed. New York, NY: McGraw-Hill, 2000

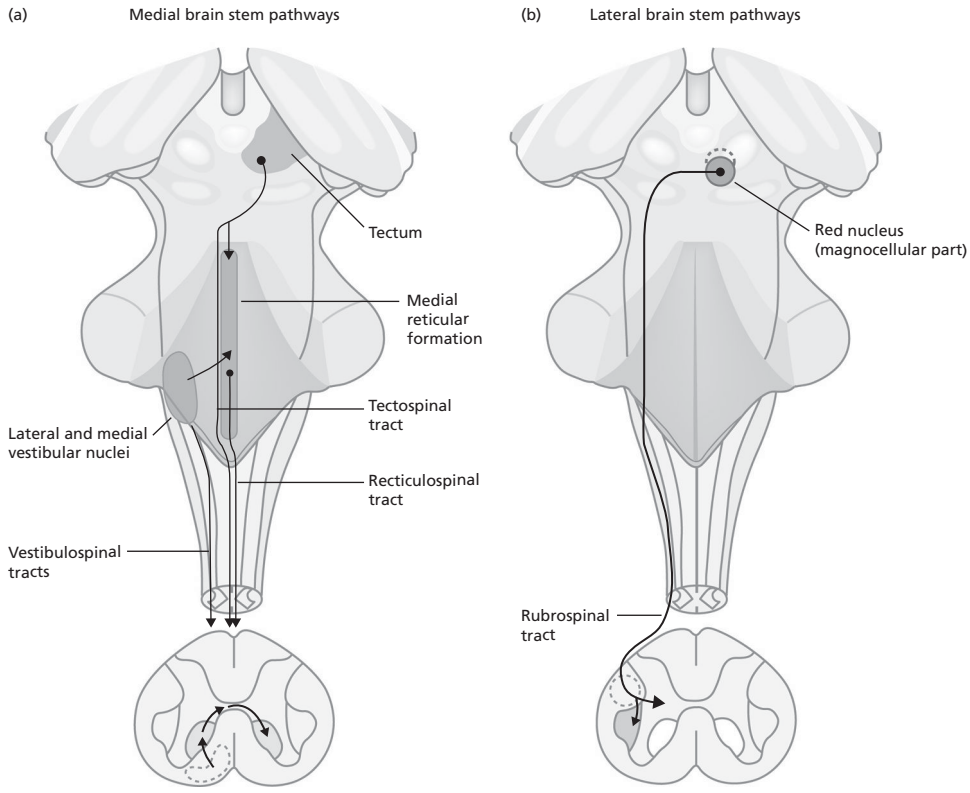

Figure 1.12 Medial and lateral descending pathways involved in motor control. (a) Medial pathways (reticulospinal, vestibulospinal, and tectospinal) terminate in ventromedial area of spinal grey matter and control axial and proximal muscles. (b) Lateral pathway (rubrospinal) terminates in dorsolateral area of spinal grey matter and controls distal muscles.

Kandel ER, Schwartz JH, Jessell TM [editors]: Principles of Neural Science, 4th ed. New York, NY: McGraw-Hill; 2000

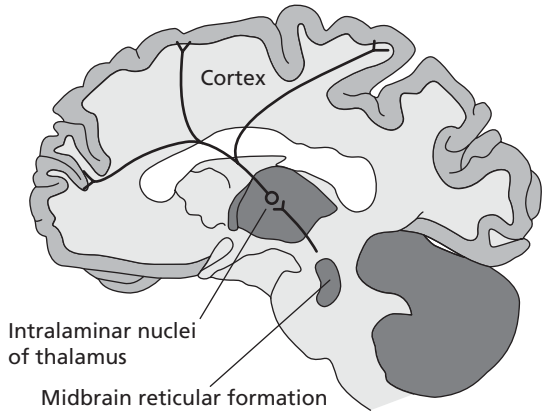

Figure 1.13 Ascending reticular tract connecting to the thalamus and the cortex—activated with movement.

Kandel ER, Schwartz JH, Jessell TM eds. Principles of Neural Science. 4th ed. New York, NY: McGraw-Hill 2000

Moreover, the neurones of the basal ganglia [44], consisting of the caudate nucleus, putamen, globus pallidus, subthalamic nucleus, and the substantia nigra, are concerned with conversion of an abstract thought into voluntary action (Figures 1.5, 1.10–1.13); they discharge before any movement occurs. Disorders of movement that involve these areas can be mimicked by psychosomatic manifestations, as has been observed historically (cited later in this chapter), and these continue to be seen in clinical practice (see Table 4.3 in Chapter 4).

Pain: physical and behavioural aspects

Pain [45] is described by the International Society for the Study of Pain, as 'an unpleasant sensory or emotional experience that is associated with actual or potential tissue damage, or described in terms of such damage'. Pain may be accompanied by hyperalgesia, which is a perceived increase in the severity of the pain, and/or allodynia that is a perception of pain from an innocuous stimulus. Pain [46–49], of various types, comprise a considerable proportion of psychosomatic symptomatology being associated with childbearing as well as benign or malignant gynaecological diseases. As discussed in later chapters (see Chapters 4–12), pain is a common psychosomatic [4] complaint that is associated with or without an organic aetiopathology. Pain is an unpleasant, complex sensation, which is a warning that something is wrong, especially when it is acute. Acute pain is often relieved during the healing process. When pain is prolonged it is referred to as chronic, and can be associated with tissue damage but it persists well after the injury has healed. Such pain is refractory to commonly advised oral analgesics, such as non-steroidal anti-inflammatory drugs (NSAIDs); there may be no relief, even with opioids. Chronicity can cause facilitation, and reorganisation of central nociceptive pathways that affect the perception of pain. Pain receptors are naked nerve endings widely prevalent in every tissue. It is conducted fast (12–30 m/s) by small myelinated A delta (δ) fibres that are related to a sharp pain sensation (epicritic pain) and release glutamate as a 'first response' [45]. This is then followed by a dull pain sensation (protopathic pain) conducted through slower (0.5–2 m/s) unmyelinated C fibres, the 'second response'. Both fibres terminate in the dorsal horn cells of the spinal cord where glutamate is the synaptic transmitter for the fast fibres, and substance P along with glutamate for the slow fibres. The dorsal horn axons ascend in the spinal cord (Figure 1.10) with some fibres terminating in the spinal cord or local viscerae, some ending in the brain stem, others terminate in the ventroposterior sensory nuclei of the thalamus, while the remainder ascend to specific areas of the cerebral cortex that are activated by pain. There are many pain receptor fibre systems, such as vanilloid receptor 1(VR1) or VRL-1, which can respond not only to pain but also to protons, and to heat above 43℃ [46]. When there is tissue injury bradykinin and prostaglandins are released that sensitise/activate nociceptors (Figure 1.14), which in turn release substance P along with calcitonin gene-related peptide (CGRP). Substance P causes degranulation of the mast cells with release of histamine that in turn activates nociceptors. Additionally, substance P causes extravasation of plasma, while CGRP acts on the blood vessels to dilate them; this leads to localised oedema, which causes additional release of bradykinin. Besides, serotonin (5-HT) is also released from platelets and this further activates nociceptors [45]. The perception of pain can be modified at the synapse of the peripheral nociceptor and the dorsal horn cells. Hence, the dorsal horn (Figure 1.14) is known as the gate where the pain sensation can be gated or modified [46].

Deep structures, such as the viscera have less Aδ fibres and few touch or temperature receptors, so the pain is poorly localised. Such pain may be associated with nausea, sweating, and changes in blood pressure. Afferents from viscera reach the central nervous system (CNS) mainly via sympathetic and parasympathetic fibres (Figure 1.15), and relay in the dorsal root ganglia, and the cranial nerve ganglia. They may also reach collateral sympathetic ganglia independent of the CNS; thus reflex control of the viscera outside the CNS can occur. Visceral pain

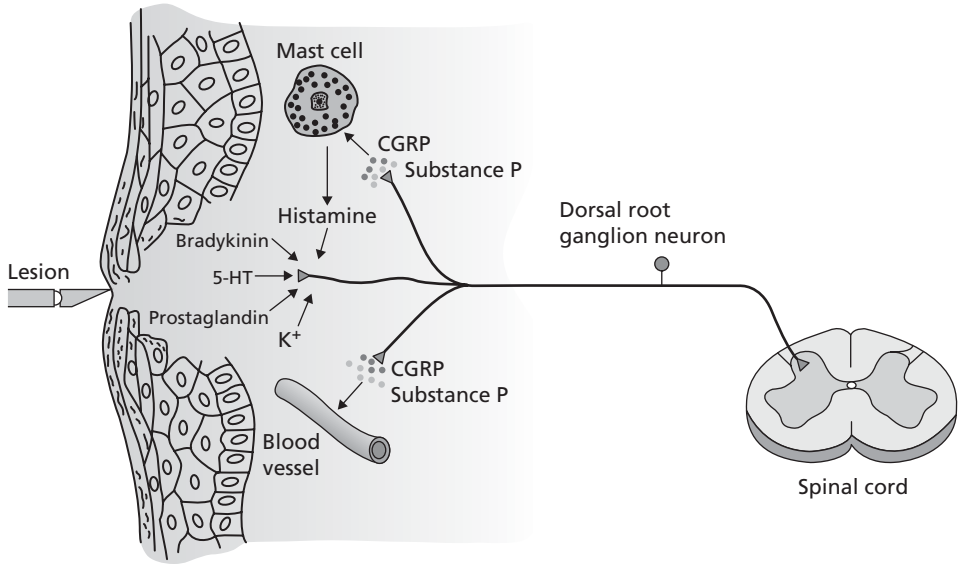

Figure 1.14 Tissue damage and chemical mediators that sensitise or directly activate pain receptors and can contribute to hyperalgesia or allodynia. CGRP, calcitonin gene-related peptide.

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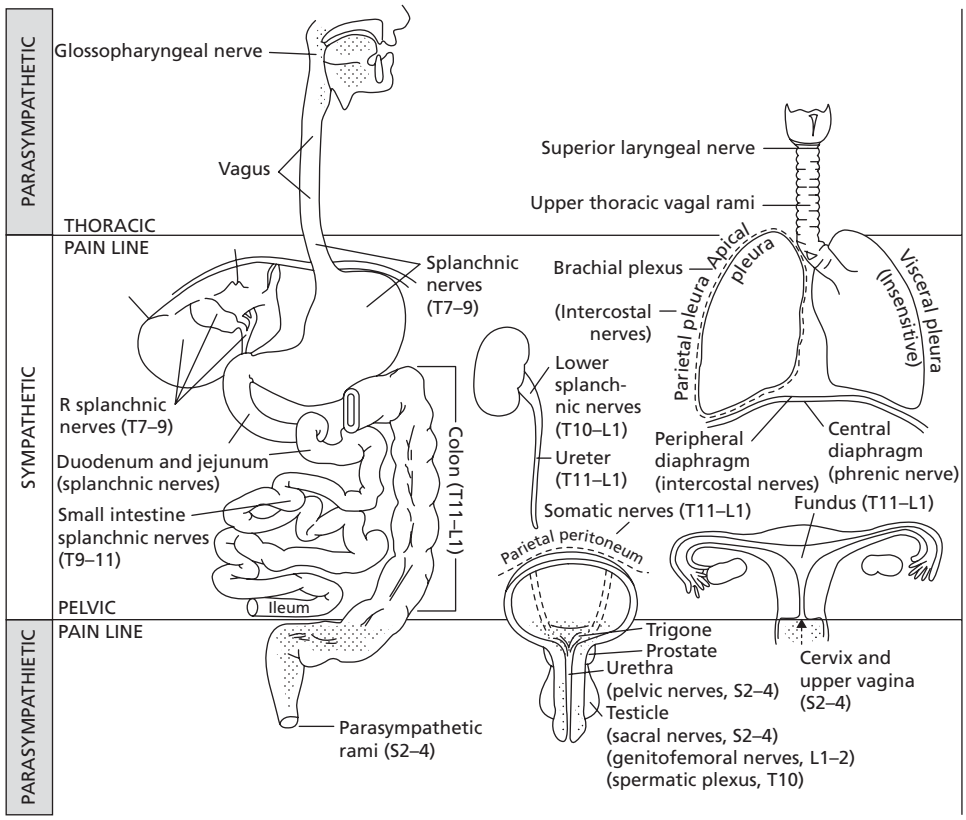

Figure 1.15 Autonomic innervation for the perception of visceral pain. Sympathetic innervation is between the pain lines and parasympathetic outside these.

Ganong's Physiology 22nd edition. p 140. (Permission from Ruth TC, Patton HD, Physiology and Biophysics, Saunders 1965)

can be generated by the distension of a hollow viscous, and often radiates to other areas. As with deep somatic pain, visceral pain, radiates to skeletal muscle, whereby these muscles contract reflexly to protect the inflamed viscera. When associated with abdominal pain, this is referred to as 'guarding'. Muscle pain occurs when the blood supply to a rhythmically contracting muscle is blocked and P substance accumulates; it is resolved when the blood flow to the muscle is restored.

Inflammatory pain occurs if there is more than a minor injury, which releases many different cytokines (Figure 1.14) and pain factors. This can continue until the injury heals. Neuropathic pain occurs when nerve fibres are injured, and it is often excruciating and difficult to treat. In causalgia, a burning type of pain after minor injuries, the pain lasts well after the injury [45], and may be accompanied by allodynia and hyperalgesia. Pain has biological, psychological, and social dimensions [47] related to its causation, as well as its perception by the patient. These need to be considered when providing pain relief. The interactions of various factors in the generation of pain is ill-understood, with acute pain considered as being protective, unlike chronic pain. Along with the sensory experience caused by the noxious stimulus, there is an associated emotional experience leading to cognitive and behavioural changes. This mind–body interaction linked to pain can make the affected individual experience distress, annoyance, or fear according to the level of threat. High levels of anxiety and apprehension, along with uncertainty about the outcome, including its impact on daily functioning, can lead to increasing severity of the pain perceived, as when labouring [48]. Hence, making the woman in labour less apprehensive would reduce the severity of the pain perceived; allaying anxiety and fear, when the woman was in labour, was practised in ancient Greece to achieve successful childbirth outcomes [33]. Furthermore, a prolonged pain experience can also manifest as depression, frustration, anger, and increasing anxiety [49] that can endure, and affect a future pregnancy (see Vignette 1, Chapter 4); this needs to be better understood in clinical practice to prevent polypharmacy/unnecessary intervention when managing anxious gravidae seeking early pain relief.

Although the centres for emotions are located in the limbic system, they can interact with the autonomic nervous system to generate various symptoms. The perception of complex conditions such as fear with pain, can be manifest as physical symptoms related to autonomic, neuroendocrine, and somatomotor systems. These can be expressed as changes in blood pressure, pulse rate, respiration, and bowel functioning. Accordingly, manifestations of psychosomatic disease can involve these organ systems concomitantly with variegated presentations that could be further modified by social interactions. There is evidence that severe emotional distress can trigger new pain or precipitate old pain in the absence of a new clinical pathology. Pain may be precipitated or exacerbated by emotional, and social crises rather than tissue insult; this is recognised by practitioners of the more holistic approach in patient care. Anxiety, depression, anger, and other emotions provoke substantial autonomic, visceral, and skeletal activity. When pain provokes anxiety, the latter, in turn, initiates prolonged muscle spasm at the site where the pain is located, as well as vasoconstriction and ischaemia, and the release of pain producing substances.

In attempting to unravel the intricacies of specific types of pain, including the perception of its severity, cancer pain seems most challenging, for its nature surpasses others in complexity. Cancer pain can be related to all the different aetiologies of pain from sensory to visceral, inflammatory, muscular, neuropathic, and skeletal. It is also modified by the site and stage of the malignancy. Moreover, behavioural responses can magnify the cancer pain, with involvement both of the peripheral and central nervous systems. In addition, the response to pain relief and the relevant quality-of-life issues in cancer sufferers (see Chapters 10 and 11)

can be related to the exchanges between the patient's relatives and carers, including attending medical/nursing staff. Therefore, achieving effective pain relief in cancer sufferers requires the recognition of these various causes/interactions, and in addition the need to deal with the multiple aetiopathogenesis of the pain. This is of greater significance where palliation is needed [50,51], which along with an uncertain prognosis affects the sufferer's perception of symptoms; it necessitates a cocktail of methods to enable adequate symptomatic relief. Healthcare provision and acceptance by the patient of culturally-sensitive, individualised management to reduce her pain, and the effects of any functional loss, despite receiving coordinated multidisciplinary care, remains a catechism for both the health professional and the patient. However, this *is* achievable [52].

Pain during labour [48], or that due to cardiac causes, is generated by some of the mechanisms discussed earlier in this chapter. Although both can occur concurrently in exceptional circumstances, only labour pain is addressed here, due to the constraints of space. The pain of labour is carried by Aδ and C fibres supplying the uterus and cervix [48]. These fibres accompany the sympathetic nerves in the uterine, and cervical plexuses as they travel along the inferior, middle, superior, and aortic hypogastric plexuses. The nociceptive afferents then pass through the lumbar sympathetic chain to the thoracic sympathetic chain that leave through the rami communicantes of the T10–12 and L1 segments (Figure 1.15). They then pass through the posterior roots of these nerves (Figures 1.10, 1.14,) to make sympathetic contact with the interneurones in the dorsal horn cells. The pain caused by uterine contractions is referred to the T10–12 and the L1 segments. The innervation of the vagina is mainly provided by the inferior hypogastric nerve (about 70%), and the nerve fibres innervating the perineum via the pudendal nerve besides contributions from other nerve fibres directly arising from the S2–4 spinal segments (Figure 1.15). The pain caused by pressure on the intra-pelvic structures involves the fibres from L2–S3 that also innervate the thigh and upper legs. Thus, labour pain can be referred to these areas on the perineum, and the lower limbs.

Trends in psychosomatic thinking [3,53–66] that have conceptualised the psychosomatic genre when appraising varied disease presentations and formulating the apt medical treatment, are elaborated next. Such concepts advocate a less reductionist approach in addressing psychosomatic clinical manifestations that are of import in the modern era. The occasional controversies between different schools of thought should aid the reader in gaining further insight into the responses due to changing biopsychosocial interfaces that could modify the manifestations and management of diseases from mind–body interactions.

Trends in psychosomatic thinking generated from the seventeenth century onwards

In the seventeenth century, René Descartes initiated the reductionist philosophy of thinking, which gained ground among some health practitioners [54]. Along with the expansion of industrialisation during the nineteenth and twentieth centuries, there was an advocacy to establish the separation of the body from the mind when providing patient care, while emphasising the physical contribution to disease. However, the holistic approach in healthcare, based on a probable link between the body and the mind remained in vogue among a few physicians, who provided comprehensive management in the eighteenth–nineteenth centuries. A vivid illustration of the mind–body connection was provided under serendipitous circumstances by American surgeon William Beaumont (1785–1853). He studied digestion in a patient who developed a gastric fistula after a major injury [55]. Among other scientific observations, he noted hyperaemia

or blanching of the gastric mucosa during various states, including fear and anger, thereby confirming the influence that emotions can have on the physical body. Another prominent medical practitioner of the nineteenth century was William Smellie, the 'Master of British Obstetrics' [56], who recognised the impact of mind and body synergism in disease, and wrote about the management of 'passions of the mind' during the 'lying in' (postpartum) period [57]. Similarly, 'puerperal mania' was also recognised at that time [57], but robust care pathways to manage these conditions were non-existent. Around 1850, expansion of hospitals began and concomitantly, there was a rise in surgery so that these two aspects that regulated healthcare provision, namely, industrialisation and surgical tools, became interdependent [58]; they have remained so. As science advanced [59] in the nineteenth century, reductionism loomed so that the whole was explained in terms of the parts. Among other developments that investigated the mechanisms of disease causation, experimental physiology and cell biology progressed in the nineteenth century, and molecular biology in the twentieth century. Hence, there was a leaning towards understanding physical health issues.

Psychoanalytic concepts were introduced by Sigmund Freud in 1900 [3,60]. He believed that psychic energy if blocked was released physiologically, and related this to an unconscious conflict. According to him, this affected organs innervated by the voluntary neuromuscular or sensory-motor nervous systems that were associated with conversion hysteria. His view of disease causation and manifestation dominated the psychosomatic concept for decades, and created antagonism against this form of medical thinking. This was more so because Freud's explanations veered towards sexuality as being the main cause of the presenting symptoms. His view was vehemently opposed by those who could only accept a solely biological causation of any disease. The concept was next taken up by Sándor Ferenczi (1910) who explained bowel-related diseases, such as ulcerative colitis, by proposing that conversion hysteria acted on organs innervated by the autonomic nervous system to generate these diseases. Others practicing at the time, such as George Craddock, applied the concept to fever or haemorrhage by introducing the belief that these were due to conversions of unconscious conflicts. Franz Alexander modified this to explain diseases caused by prolonged physiological changes due to repressed conflicts. This was applied to the understanding of the hypersecretion of pepsinogen in gastric hyperacidity. Next, Helen Deutsch (1939) spread the concept that trauma experienced since birth was related to adult psychosomatic disease. Phyllis Greenace (1949) and Jurgen Ruesch (1958) emphasised that disturbances in communication, between patients and their environment, caused psychosomatic disease; it was associated with an 'infantile type' personality. Finally, Peter Sifneos and John C. Nemiah (1970) brought out the concept of 'alexithymia'. They believed that developmental arrest in the capacity to express conflict resulted in psychosomatic manifestations. This was modified to 'somatothymia' by Stoudmine, who also specified the impact of cultural influences on somatisation.

Psychophysiological concepts were advocated by John Mason (1968) who stressed the psychologically-mediated individual response to stress as being the dominant factor in disease causation. This was taken up by Richard Lazarus in 1984, who emphasised the person's cognitive appraisal as being critical in responding to stress and disease manifestations. Earlier on, another proponent, Walter Cannon (1927), had demonstrated that the response of the autonomic nervous system, and emotions were related to disease conditions, which were in turn based on the Pavlovian behavioural experimental design. Harold Wolff (1943) investigated the physiological response to stress and emphasised that if stress was prolonged, it would lead to structural changes in certain organs/systems. He thus established the basis of psychoimmunology, psychoendrocrinology, and psychocardiology. Soon after, Hans Selye (1945) created awareness of the general adaptation syndrome under stress. Next, the A Type personality and its association with cardiovascular disease was researched by Meyer Friedman (1959), although this concept had been

introduced earlier by Helen Dunbar. Among similar conceptualisations, the basis of psychoneuroimmunology was established by Robert Ader in 1964.

Sociocultural concepts were propagated by Thomas Holmes and Richard Rahe in 1975, when they associated the occurrence of stressful events with disease. John Cassel (1976) proposed that psychosocial factors acted as the stressors, which lead to disease. Nevertheless, certain psychosocial factors could also act as buffers that reduced the impact of the stressors. Margaret Mead, James Halliday, and Karen Holmes related disease to cultural aspects with particular emphasis being given to the effect of stress on the mother, which was then conveyed to the infant and child, as in the transmission of anxiety (see Chapter 3).

The vast nineteenth–twentieth century advances in industrialisation with relevant modifications in hospital healthcare provision in Europe continued to direct the attention of many medical professionals to the disease rather than to the individual. In North America, patient-centred care however continued to be practised, and a brief mention taken from the biography of one of its advocates, Sir William Osler [61], is presented here. His exclusive contribution to medical learning and clinical practice is notable.

Sir William Osler (1849–1919), a Canadian physician, who practised in Montreal (McGill University), then in Philadelphia (University of Pennsylvania) and in Manhattan (Johns Hopkins Hospital), was a visiting Professor of Medicine and then a Regius Professor at Oxford, prior to gaining a knighthood. He was the son of English settlers who moved to the backwoods of Canada to serve the Church, and it was expected that he would be a minister like his father, a Cambridge graduate in theology. However, young William changed course to natural sciences, and then to medicine after having first entered college to learn theology. He believed that the concept of medicine practised at the time had started with the ancient Greeks; the philosopher Galen and philosopher/doctors, such as Hippocrates, promoted the concept of rational disease management through good observation and clinical skills that was learnt experientially. As the Greek physicians had done, Osler practised patient-centred care, and taught this to his medical students. The first step in the assessment of patients in ancient Greece had been inspection, followed by physical examination; in the eighteenth century this art had advanced to also include percussion and auscultation, which was incorporated into Osler's medical teaching. He also demonstrated awareness of the mind–body interaction in disease causation, and illustrated this in his management of select patients who sought his advice. Since his childhood, he may have been exposed to the idea of mind–body connection in diseases besides the usefulness of spirituality in curing certain diseases. His father occasionally had to use a mind–body approach, along with the spiritual approach in his ministering; for example, when a healthy teenager, who had been convinced by her associates that she was dying, was brought to him for blessings, he persuaded everyone accompanying her that she was healthy, should be fed, and he also advised that they stop making the shroud for her; she became normal in a few days. Osler learned from this childhood incident. Through his ever-increasing clinical knowledge and skills, he was able to differentiate between management of patients who needed a solely physical approach, as with treating appendicitis or a mind–body approach, as with eating disorders. He was adept at differential diagnosis, such as in the management of a delirium caused by a high fever, which could be due to pneumonia as opposed to delirium resulting from alcoholism. He was a clinician with scientific interests but refrained from research due to the major allocation of his time to medical teaching and patient care. Nevertheless, he followed the results from medical research that was relevant to his clinical work.

Sir William, was an avid reader, in addition to being a prolific writer (medical topics with history/literature), and in 1892, he wrote the first version of the medical textbook '*The Principles and Practice of Medicine*'. He mentored his medical students, 'who adored him' [61], and showed compassion towards his patients. Among several anecdotal evidences, there is a record of his

philanthropy when he paid for the treatment of a sick child, which included expenses for the child's travel to hospital with his destitute mother, both of whom were strangers to him. Although blood-letting, and using leeches for treating diseases, as practised by the Greeks, was still in vogue, it was uncommonly practised by him when more conservative measures had failed to provide relief. Additionally, he was experienced in carrying out autopsies since his medical student days, and continued pathological examinations when practising medicine to help study the structural and functional effects of diseases. This included his interest in brain and behaviour (topic updated in previous pages). In a scientific paper, 'The brain of criminals', he quoted Shakespeare on the mind–body relationship, 'Our bodies are our gardens to which our wills are gardeners; so that if we plant nettles or sow lettuce, set hyssop or weed up thyme … the power and corrigible authority lies in our will'.

In Med–Clinic meetings, where the clinical presentation, along with the associated pathology report was discussed, Osler would dampen the enthusiasm of those gynaecologists who had removed normal tubes and ovaries by constantly questioning the need for such 'heroic surgery'; such defeminising treatment is controversial even today (see Chapter 7). Where indicated, he practised the holistic approach of addressing the mind along with the body as the ancient Greek physicians had done. This particular approach was needed in the management of certain diseases such as anorexia nervosa, which remains a modern-day scourge (see Chapter 4). His expertise in applying the mind–body approach for successful treatment outcomes includes the documented case of a woman who was unable to walk for three years, despite many treatments, because of her complaint of paralysis of her legs. She started walking after he treated her for two weeks, when he made her believe that she could do so, again suggestive of a psychosomatic method of cure for such illnesses; this is also in evidence today (see Chapter 4). His interest in furthering pathology in order to understand the natural history of the disease made him collect pathological specimens, and then leave his collection for future learning; his interest in teaching medicine made him leave his cache of books to a library; a gift to posterity. Sir William's students learnt to appraise diseases by understanding the differences between those due to solely biological aetiopathologies and those due to mind–body interactions; appropriate management decisions were taught.

In the UK, from the mid-nineteenth century onwards, a few gynaecologists (Snaith and Ridley, 1948; Byrne, 1964; Jeffcoate, 1969; Beard, 1977) recognised the interactions of the psychological with social factors in the aetiopathogenesis of gynaecological complaints [4]. They successfully applied this concept to patient management. However, this recognition of the psychosomatic approach in the management of gynaecological diseases due to mind–body interactions, did not spread beyond their units. Consequently, its wider application to patient care or related research petered out when the local enthusiasm had waned. Meanwhile, technological advances focussing mainly on the physical aspect of diseases led to a mind–body dualism in clinical management by marginalising the psychosocial aetiological factors. A turf-war between specialties was created with many patients failing to get relief when they had a clinical condition with a dual pathology but health professionals considered one aspect only. Coinciding with the paradigm shift of the 1970s [62,63] when the biopsychosocial model of disease was introduced in the USA, consumers in the UK began voicing dissatisfaction with their healthcare; at the time it was solely based on addressing the physical aspects of disease. There were moves to address consumer concerns by the Department of Health, UK [64].

The Systems Theory [60,62] is being mentioned here, as it relates to another twentieth century concept of psychosomatic medicine. It was introduced in 1958 by Adolf Meyer, and after that it was endorsed by Leon Eisenberg (1995). Proponents believed in the 'biopsychosocial' model with slight variations among the different approaches practised by each individual. Eisenberg proposed

that the mind/brain responded to biological and social influences, whereas Meyer supported the integration of the biological with the psychological, social, developmental, and environmental factors, as an integral part of psychosomatic evaluation. George Engel (1977) coined the term 'biopsychosocial' [62] with its fundamental principle based on the Systems Theory, which in turn he linked to Meyer's concepts. Additionally, in 1977, Herbert Weiner emphasised that in the understanding of disease, not only should the biological, psychological, and social aspects be linked but they should also be associated at the genetic, molecular, and neurophysiological levels. Another proponent, Zbigniew Lipowski (1970), observed that when the psychosomatic approach is undertaken to explain one's vulnerability to disease, the past and current history must be considered along with the somatic, genetic, and constitutional factors, besides the emotional, environmental, ecological, and infectious causes.

The Stress Theory is briefly discussed now, as it is current. Stress is a leading aetiological environmental factor in the modern social environment that can lead to multi-organ damage with deleterious effects. Recent studies indicate that its effects can generate both physical and psychological symptoms due to neurogenic inflammation arising from the release of cytokines besides influencing the immune privilege of the endothelial cells of the blood–brain barrier [65]; this impedes effective functioning. Stress also affects the peripheral nervous system simultaneously. Exposure to any stressor, whether a psychological stress, central nervous system injury/infection, or neurological disease, results in proinflammatory responses via neuropeptides, cytokines, and stress hormones of the central nervous system; this leads to several mental health disorders. Again, stress may be closely involved in the generation of many psychosomatic manifestations, as with, PTSD (see Chapter 4) or a biological disease condition with psychosomatic undertones, such as obesity (see Chapter 8). The relationship of stress to disease was first studied systematically by Walter Cannon (1875–1945). He investigated the 'fight or flight' response of the organism due to stimulation of the autonomic nervous system, particularly the sympathetic system. It could result in hypertension, tachycardia, and increased cardiac output. When the animal could fight or flee, this response was useful. That said, in the habitually suave person who can do neither, such stress can result in cardiovascular or neuroendocrine responses that can cause considerable morbidity with sometimes, grave sequelae. Harold Wolff in the 1950s studied the correlation of the gastrointestinal tract with specific emotional states, such as hyperfunction with hostility or hypofunction with sadness, which in turn were modified by the patient's unique responses to the different types of stress. The general adaptation syndrome was the model of stress developed by Hans Selye (1907–1982). This consisted of the alarm reaction in the 1st stage of resistance to stress, followed by adaptation in the 2nd stage, and finally exhaustion in the 3rd stage. Any remaining resistance could be lost in the 3rd stage. He described stress as the bodily response to pleasant or unpleasant situations, and he called the latter 'distress'.

The nonspecific Stress Theory suggests that chronic stress can also lead to anxiety that can have a deleterious effect on the functioning of many organs. This can lead to a susceptibility to organ damage but this susceptibility may be due to the action of environmental factors or a possible genetic vulnerability. Moreover, multiple stressors occurring even over a short period of time or chronic stress due to a single stressor that acts for a prolonged period can have major repercussions. Perception of severe stress such as that associated with sudden assault, even if only a single episode is experienced, can have long-lasting sequelae (see Chapter 12). There is some evidence that those who face stress optimistically rather than pessimistically are less likely to experience psychosomatic disorders, and recovery could be easier for them. Cure can be difficult where there is impairment in the neuroendocrinological functioning following prolonged stress with ensuing structural changes. In such individuals, activation and reorganisation of the personality is needed to help cope with tensions that produce related pathophysiological end-organ damage

and psychosomatic sequelae. Additionally, it is reported that chronic stress reduces telomerase length and promotes functional ageing, which potentially increases the risk of onset of various diseases [65,66]. It is also recognised that implementing biopsychosocial patient-centred care, including specific psychotherapy can be beneficial in the recovery from the harmful effects of stress. Providing such care can be tenuous without obtaining pertinent information from the patient's narrative of her life-history, which is considered as an essential feature of medical evaluation. Hence, the suitability of a method of keeping medical records that is currently being promoted, which transgresses this requirement of keeping the patient's past history, has been questioned [66].

Further attention to the need for the development of psychosomatic awareness, and promoting the ongoing trend for its application to patient care, is considered here.

Promoting the psychosomatic approach in futuristic clinical practice

Medical concepts in the twentieth century seemed to have set the trend in thinking towards a patient-centred approach [67] for the management of many modern-day diseases. This has gained ground over the years as contemporary clinical practice along with patient choice have advocated this [68,69]. It is further supported by the shift towards integration of the scientific basis of healthcare with the patient's values, in order to improve health outcomes, and prevent patient dissatisfaction, thereby avoiding potential litigation [70]. Most clinicians do not lack accurate scientific information, yet unfamiliarity with making individualised decisions informed by the patient's values, along with relevant medical evidence, could be a challenge for many. Although this seems perplexing for those unaccustomed to providing patient-centred, psychosomatic healthcare, the process was followed even by many ancient medical practitioners, who were able to achieve satisfactory outcomes [33]. The concept of mind–body interaction became unpopular in medieval times, and was neglected with the advent of the industrial age but appears to have made a comeback [1]. Paradoxically, among newer developments, the need to continue keeping individual case records in order to rectify the fallacies of electronic medical records (EMR), such as incompleteness, inaccuracies, and inconsistencies in data entry, has been suggested [71]; this would be a novel use of maintaining records of clinical cases to rectify EMR lapses, and by so doing assist in clinical management/research. Additionally, the need for analysing clinical cases [72] along with the assessment of larger samples using quantitative statistical methods has been considered as useful when evaluating silent biopsychosocial morbidity in women, with the patient's perception of severity of her symptoms being included [73]. The evaluation of the severity of symptoms using both methods of assessment is useful, as statistical significance does not always equate with clinical significance. Therefore, retaining case-based details makes clinical sense, and this is upheld by specialists from disciplines other than obstetrics and gynaecology [66,70].

Manifestations resulting from mind–body interactions are bound to increase in the twenty-first century because of emerging social maladaptations [4], and the trend for population migration (see Chapter 12). This can create stress, which in turn can lead to autonomic, neuroendocrinological, cognitive, and behavioural alterations [74] in the affected person. They can present as somatic manifestations of their underlying fear and dysphoric symptoms, in addition to behavioural effects, such as drug use (see Chapter 4). The effect on stressed individuals consequently takes various guises. These could present in the female as problems related to menstruation, pregnancy, intrapartum, and postpartum symptoms, subfertility, pain, benign and malignant tumours, and the menopause; all are discussed in the chapters that follow. The patient's perception of her

symptoms [72] modulates her help-seeking behaviour [73] and her response to treatment, as does her social status. Around 1939, HE Sigerist, in his book, *On the History of Medicine* [75], referred to his lecture at the 66th Annual General meeting of the American Gynecological Society, in which he had highlighted pertinent developments in gynaecology. At that meeting, he also emphasised that a woman's place in society determined the overall respect for her, and the adequacy of the treatment of any disease/s that she was suffering from [75]. His observation is applicable even now, as variations in attitudes towards women among different populations can determine the type of healthcare provision that they can access. It is apt, therefore, for professionals providing healthcare to women to understand the connection between the status of the woman in her community, and her ability to comply with the medical advice, particularly if the advice is unacceptable to her family/community. This is of relevance for the detection and management of psychosomatic manifestations, such as mood symptoms, as what is classed as abnormal in the West may not be considered so within other culturally diverse populations; this was reported from studies of certain populations from Africa and New Zealand [4]. Including cultural sensitivity in a care pathway would aid the development of a more acceptable treatment option, and facilitate patient compliance.

At the first clinical encounter, when attending health professionals deal with complex biopsychosocial causative factors, the recognition of the physical along with the psychosocial initiating/aggravating issues for each individual, deserves close attention; these can vary between individuals. An adequate assessment at the start has the long-term benefits of facilitating suitable management with potentially better outcomes, and increased patient satisfaction. This can prevent progression to more permanent neuroendocrinological changes, which may generate psychosomatic illness. There is some evidence [76] that if only symptomatic physical relief is provided without addressing the various biopsychosocial issues associated with the pathogenesis of manifestations, the unsolved problem would progress to chronic psychosomatic illness. The dissatisfied patient would then repeatedly seek the attention of health professionals/hospitals to obtain symptomatic relief. Conversely, if the problem is dealt with comprehensively at the start, the likelihood of patient satisfaction would be higher, and long-term intervention for psychosomatic disease, may be unnecessary. Further research into such clinical conditions, and the associated workings of the limbic system [40,41] is needed.

Thus, understanding the physical and psychological interactions along with the social contributions that result in psychosomatic obstetric and gynaecological diseases seem obligatory. An example of the possible benefit of recognising the physical along with the psychosocial aspect has been demonstrated by analysing the triennial British Maternal Mortality Reports, UK. Just over six decades of regular audit and publications as British Maternal Mortality statistics were reported after analysing data collected on maternal and infant mortality rates. This helped modify clinical practice to prevent associated morbidity and leading to fatalities. These modifications facilitated the development of care pathways addressing the physical causes of maternal morbidity/mortality but psychiatric causes of mortality gained prominence with the advent of this millennium [77–80]. Further action is ongoing to create clinical awareness and reduce maternal deaths due to psychiatric causes; these often relate to psychosocial initiating/maintaining factors. Collaborations between different organisations to form the Maternal Mental Health Alliance [81] for preventing morbidity/mortality in mothers with mental health issues has been undertaken in the UK. Parallel organisations worldwide, including those under the auspices of the World Health Organization, are also helping to tackle maternal/women's biopsychosocial health issues through the strategies of the Sustainable Development Goals [82]. Recognition of the psychosomatic aspect is meet when planning medical education/training to reduce morbidity, and minimise dissensions among specialisms. A paradigm shift in the approach to detecting and managing obstetric and

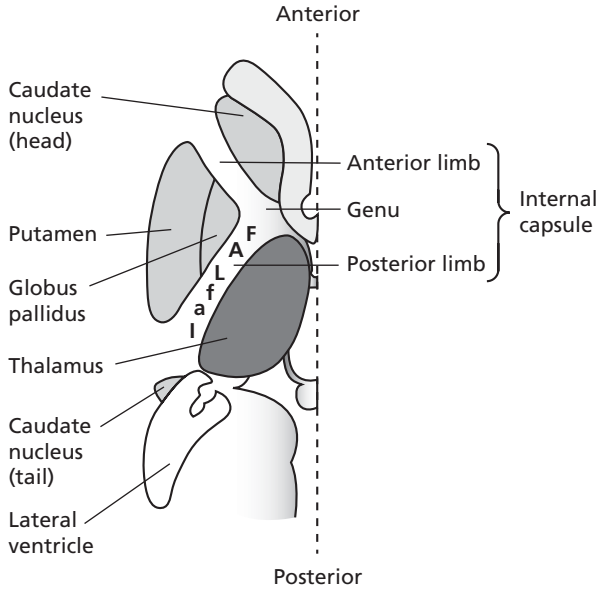

Figure 1.16 Internal capsule, basal ganglia and thalamus (horizontal section—descending motor fibres from the face, arms, and legs (FAL) run in front of the sensory fibres (fal).

Waxman SG ed. Clinical Neuroanatomy. 26th edition. McGraw-Hill Companies, Medical. 2010. p 146

gynaecological diseases is required [6], with neither physical nor the psychosocial aspect being marginalised.

A structured approach to detection and management has been developed (see Chapter 2) to aid the unfamiliar practitioner in applying the psychosomatic approach. Neuroimaging studies [76], such as functional magnetic resonance imaging (MRI) (Figures 1.16, 1.17,), along with

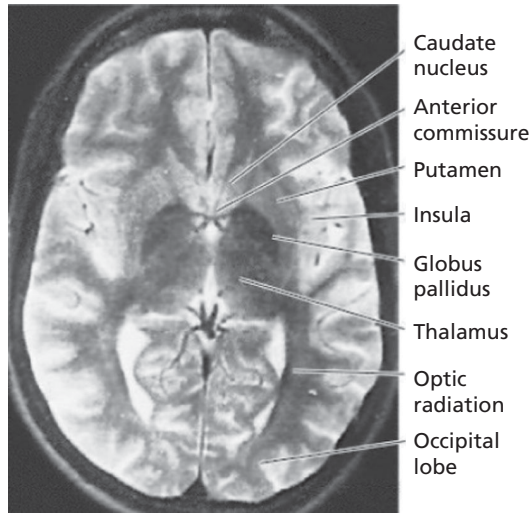

Figure 1.17 MRI of the horizontal section of the head.

Waxman SG ed. Clinical Neuroanatomy. 26th edition. McGraw-Hill Companies, Medical. 2010. p 147

interdisciplinary collaborations have the inherent potential of throwing more light on this under-researched subject area. Further progress in imaging, neuroendocrinology, neuroimmunology, and cell biology will continue to improve our understanding of such diseases. This includes advances in magnetoencephalography, which can detect trans-magnetic impulses and blood flow patterns in specific areas of the brain during various psychological states. Brain imaging after exposure of these areas to positive and negative life events has revealed a continuing spectrum of visual patterns related to everyday affairs. Structural imaging studies using computed axial tomography and MRI have reported neuroanatomical changes in the subcortical regions due to cortical atrophy associated with recurrent severe depression. Additionally, functional brain imaging studies using functional MRI (Figure 1.18), and positron emission tomography (PET) have shown decreased anterior brain metabolism in depression with decreased blood flow in dopaminergically innervated mesocortical and mesolimbic systems [76].

Despite continuing advances in investigations, certain symptoms such as chronic pain/causalgia, remain perplexing, and management challenges have to be dealt with using a mind–body

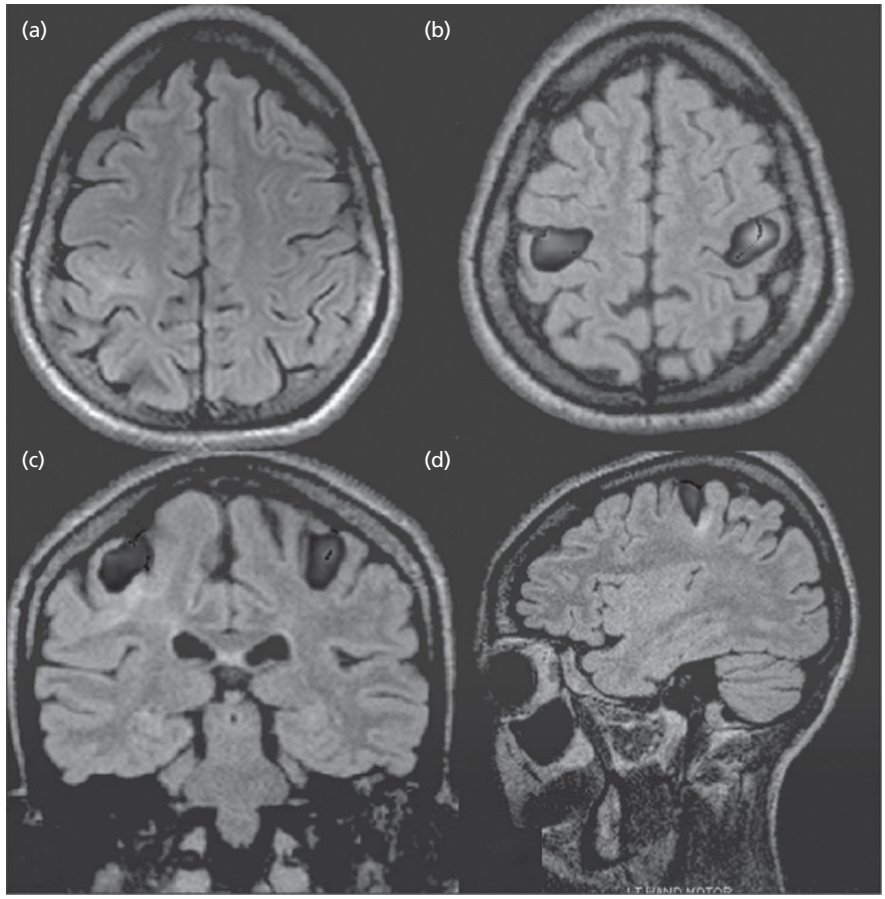

Figure 1.18 Functional MRI scan of brain activity with movements of the right and left hands showing finger tapping.

Kesavadas, C., & Thomas, B. (2008). Clinical applications of functional MRI in epilepsy. The Indian Journal of Radiology & Imaging, 18(3), 210–217.

approach [83]. Hence, to the clinician presented with day-to-day psychosomatic problems, clinical methods developed during training will remain the mainstay of management. Sophisticated technology will remain exclusive to research centres until findings are robust enough to justify wider availability for routine, economically-sound, patient-centred care. Similarly, any known benefits of such imaging in managing select conditions when confirmed, needs to be translated into clinical care, expeditiously.

Meanwhile, advances in managing diseases by individualised mind–body treatment should continue. A review [84] of relevant trials concluded that training in patient-centredness could improve the communication of health professionals with patients, enable clarification of patients' concerns, and increase patient satisfaction with the care provided. This model of patient-centredness, conducive to the clinical application of the psychosomatic concept aims to tailor the medical information provided according to the personality/needs of each patient. It relates [84,68] to five dimensions: (i) the biopsychosocial perspective that is an extension of the scope of medicine from the purely biological to the psychological and social levels; (ii) the 'patient-as-person', which discerns the patient's experience of illness; (iii) the promotion of individual responsibility; (iv) the therapeutic alliance that elucidates a professional–patient relationship based on care, sensitivity, and empathy; and (v) the 'doctor-as-person'—self-awareness and attention to the professional–patient relationship. These factors also influence positive patient feedback—a must for ongoing appraisal of medical personnel who are in clinical practice.

Medical history reminds us [85] that, '*the practise of medicine in a societal context, allows for the discovery of the concept of humanism and parallels the evidence-based approach to medical practise that is promoted today*'. It is beneficial for advancing clinical care [84].

Conclusions

Tracing medical history from ancient times has shown the importance of time-tested methods of physical and mental assessments of patients by using good clinical observation, and appropriate knowledge for treating illnesses. Certain ancient medical practitioners provided medical concepts, which have stood the test of time. The 'Hippocratic Oath' has given physicians a strong ethical base for promoting good medical practice. Soranus of Epheseus, who practised medicine in the first century A.D, wrote extensively on the biological and medical sciences, including women's diseases. He was rational, and in his carefully worded epitaphs presented logical arguments for providing appropriate healthcare to women. One of these treatises that survived destruction by natural disasters and wars, was translated into English, as Soranus' *Gynecology*, has been discussed briefly. The more comprehensive mind–body assessment of patients since those times was promoted in various regions of the world but was under-recognised from the seventeenth century until the latter part of the twentieth century.

Other short discourses in this chapter on anatomy, physiology, and pathology pertaining to psychosomatic symptomatology, such as pain, indicate a continuing need to understand the basic sciences that encompass a psychosomatic approach. The history of evolving psychosomatic concepts in healthcare has demonstrated varying interest in this field over the years. Its usefulness in managing symptoms of diseases that affect both the body and the mind has been upheld to inform the reader of its current relevance in providing effective healthcare. Comprehensive biopsychosocial management has become less popular since the eighteenth century, particularly when the adverse impact of industrialisation with its emphasis on the biomedical aspect, created a dichotomy between the body and the mind. It promoted healthcare delivery exclusively for managing the physical aspect of diseases. Consequently, patients with psychosomatic illnesses were alienated from mainstream healthcare in Europe. Concomitantly, unhealthy competition between specialisms for the finite healthcare resources began, which affected the provision of

healthcare, and caused patient dissatisfaction. What was meaningful to patients was ignored by many physicians. Sir William Osler, a Canadian physician practised in North America in the eighteenth–nineteenth centuries, and in his later years in Oxford, as its Regius Professor. He was influenced by Hippocrates and Plato's concepts and used a patient-centred approach with recognition of mind–body interactions as the causative factor in certain clinical presentations. He taught his students about the scientific basis of the aetiopathogenesis and management of diseases, including those from mind-body interaction. In addition they had a duty to provide compassionate care. He left a collection of pathological specimens and a cache of books as a legacy to medical education.

The psychosomatic approach seems to be gaining ground in clinical practice in response to current patient requirements/demands. It is now recognised that the need for assessment, and management of women's diseases due to mind–body interaction that are related to obstetrics or gynaecology is rising. This could be partly due to the socioeconomic instability brought about by wars and migrating populations. Furthermore, advances in neuroendocrinology and neuroimaging have unravelled various aetiopathologies behind psychosomatic disorders. Clinical application of such knowledge to patient care is still in its infancy. The results of such investigations should be used in conjunction with conclusions from the history and clinical examination when planning management. This calls for medical training to incorporate the psychosomatic aspect in order to meet the current demands of patients, and has implications for future healthcare provision. The patient-centred approach has retained its rightful place for managing patients with mind–body afflictions since ancient times. It will continue creating history in futuristic medical education for obstetricians and gynaecologists, on a par with other more familiar clinical methods.

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Chapter 2

Teaching psychosomatic obstetrics and gynaecology

Johannes Bitzer

Theoretical background

Residents in gynaecology and obstetrics as well as specialists/consultants are trained for many years in accordance with the concepts of biomedical thinking and practice. This basic way of understanding patients' health problems using this approach can be described as follows:

> Symptoms are caused by objectively measurable biological factors, which constitute disease entities that are independent of individuals. These diseases are defined in the biomedical code, and structured into subunits such as aetiology, pathophysiology, diagnostic procedures, and therapeutic interventions. This code is used internationally, is continuously being adapted, and the truth of the code is evaluated by using scientific evidence that is the basis of standardised medical practice.

The biomedical model

The biomedical model determines a specific relationship between the physician and the patient; both exchange facts when partaking in a medical evaluation. Both partners have concepts of health and disease, which may be very different, but the physician's concept dominates, and determines the interaction. Usually the physician (gynaecologist/obstetrician) is considered the expert in the subject area, while the patient is considered to be less knowledgeable in the field; the physician is active in informing, while the patient is usually passive, and listens to the physician; there is a hierarchical positioning between the two often placing the physician in the upper echelons.

This relationship determines the framework for the disease and physician-centred communication, which is part of the biomedical model. In this disease-centred communication, the physician takes the lead quickly, and determines the agenda.

The physician uses the classical frame of history-taking with a catalogue of preformed questions. These questions are based on known disease entities, and facilitate the physician in reaching an early diagnosis with leading questions assisting the physician in confirming the, occasionally preformed, ideas about the patient's ailment. Emotions are usually suppressed during the communication. The patient is a passive recipient of a therapeutic prescription. A large part of such a medical consultation deals with information giving. The physician informs the patient regarding the risks and prevalence of diseases, about diagnostic measures, and about the prognosis of the disease when the diagnosis is confirmed, the therapeutic options with success rates, and the side-effects of the medication prescribed. Thus, the educational part of such communication needs didactic skills, and some basic knowledge about how to convey information.

The advantage of this type of communication is that the information is gathered by standardised questions and thus it is well structured and organised. The communication is digitalised, and

helps the physician quickly reach the standardised definition of the problem, which in turn helps the physician to reach an evidence-based solution or provide treatment.

It is evident that this form of communication is very effective in an acute, emergency situation, where there are limitations, particularly of time and resources; thus a defined physical disease is treated in a specific way to obtain prompt results.

Limits of the biomedical model

The need for a complementary model to understand disease

In clinical practice, patients frequently present with problems in which the biomedical model is inapplicable, as it is unable to assess comprehensively the real-life experience of each patient and guide appropriate management. Gynaecologists and obstetricians are commonly confronted with problems that do not fit into the limited confines of the biomedical model. In these cases, the same disease with the same symptoms, and the same diagnosis evokes completely different responses in different individuals such as observed with a miscarriage, pelvic pain, infertility, cancer, etc.

Questions: Why/how do these differences come about in patient responses? How can the gynaecologist/obstetrician try to understand and handle these differences?

Answers: In these cases, the gynaecologist/obstetrician has to recognise that the presenting symptoms do not fit into commonly known diseases. Examples include, lower abdominal pain, multiple symptoms affecting different organ systems, unexplained infertility, interstitial cystitis, dyspareunia, etc.

Questions: Where do these symptoms come from? How should such a patient be treated?

Answers: Again, the patient and the gynaecologist/obstetrician may be confronted with a clinical situation in which the same evidence-based solution that is applicable to another patient cannot be applied, or in which a specific objective of treating the patient can only be reached by using more than one option. Patients may sometimes have to make personal choices due to the complexities of their illness, and the healthcare provision that is available.

Questions: How can the physician help patients find the appropriate solution for them and make choices in their best interests?

Answers: Sometimes therapeutic interventions are well founded on evidence but the patient does not comply. Although health risks of some behaviours are well known, the patient may continue to maintain a high-risk behaviour.

Questions: What type of disorder is this? How should the physician diagnose and treat it?

Answers: Patients can present with personal problems such as stressful life events, in the context of adolescence, pregnancy, the postpartum period, peri/post-menopause, sexual difficulties, and partner/family conflicts, and they seek help from their gynaecologist/obstetrician. The physician following a biomedical model may be constrained in dealing with these complex psychosomatic diseases.

Questions: How can the physician respond to these demands and problems, which are not classified as diseases in the prevailing medical textbook?

Answers: Some of these patients with complex problems may be difficult and quite demanding; the gynaecologist/obstetrician may feel exhausted when repeatedly having to have consultations with them. In these cases, the question would arise whether there are cues in disease management

that address difficult patient–physician relationships, and how these relationship disorders should be dealt with.

The psychosomatic or biopsychosocial model

The clinical conditions not well addressed by the biomedical model include not only the specific disease as an entity, but also relate to the patient seeking help, the context, the patient's behaviour, and their relationships. Therefore, an appropriate model to address this broader perspective must include these dimensions, and it is generally referred to as the psychosomatic model that depicts the interacting biopsychosocial factors, which relate to the illness [1,2].

In this model, symptoms are the manifestations of the individual's suffering and are the result of an interaction of biological, psychological, and social factors, specific for the patient. This means, that the basic unit of observation is the interaction of the disease process, and the individual's life situation.

Diagnostic measures therefore have *to add* to the detection of measurable biological abnormalities *an understanding of the patient's life situation, and patterns of thought, feelings, and behaviour, relevant to her illness*. In the psychosomatic approach, the therapeutic plans take into account the characteristics of the patient's motivation and her objectives, values, and behaviour.

This model leads to a different patient–physician relationship, and a more comprehensive communication pattern [3–5]. In addition to the biomedical facts garnered through the verbal exchange using a biomedical vocabulary, the physician and the patient make emotional contact, i.e. the patient expresses emotions and the physician understands them and responds to the patient's emotional cues. Thus, what is called an 'affective contact' is created. There is more of a balance in this emotional exchange than there is when communicating with the patient to obtain biomedical facts only.

This explicit definition of the patient–physician relationship itself is part of the interaction in biopsychosocial communication, and it is considered an important aspect of diagnosis, as well as treatment. The patient who seeks help, trusts the gynaecologist/obstetrician to act in her best interests, and to be competent in providing comprehensive healthcare. The gynaecologist/obstetrician with psychosomatic expertise who wants to help, cares for the patient, uses relevant competencies to work for the patient's best interests, and this leads both towards establishing a relationship of confidence, and also of trust.

This patient–physician interaction sets the frame for a different type of communication, which is called the *patient-centred communication*. In a patient-centred communication, the patient's *story (narrative) is given more weight*. The questioning is much more of a *'Socratic dialogue' in seeking the truth* with reference to the patient's description of her condition, as well as giving the physician feedback regarding their communication. There is respect for and adequate responses to the patient's emotions in addition to assessing her physical complaints. The patient defines the agenda. The patient is *an active partner* in the therapeutic decision-making, and in the choice for any interventions to treat her health condition.

Psychosomatic teaching in obstetrics and gynaecology

Communication skills

Communication skills can be subdivided into:

a. Professional listening: patient-centred communication
b. Response to emotions
c. Professional information giving: information exchange
d. Communication and counselling in special clinical situations

Professional listening: patient-centred communication

Professional listening means that the physician does not only hear the facts related to physical symptoms, but also perceives and responds to the emotional messages sent by the patient during their discourse. The gynaecologist is alert to the messages about self-disclosure from the patient, and pays attention to their professional relationship. Listening in a way that encourages the patient to tell her story is also promoted by the gynaecologist by using the following methods:

- *Waiting*: Giving the patient time to think and express herself. This means that the physician has to learn to hold back during the conversation, and use silence, and pauses as a means of encouraging dialogue.
- *Echoing*: Repeating a specific word or expression of the patient to indicate active listening, and reassure that the physician is following the patient's story.
- *Mirroring*: Reflecting body language or a whole verbal sequence in the words of the patient.

Checking back and summarising: The physician summarises in her/his own words what she/he has understood from the patient's story. This is the basis of mutual understanding by assuring that the physician, and the patient have found a common language for the exchange of information, and that the patient's needs and her agenda have been understood by the medical practitioner. In practical terms, this means that the physician is trained in trying to understand the different dimensions of a message given by the patient [6]. The dimensions referred to are as follows:

The dimension of facts: What are the facts the patient is transmitting?
The dimension of self-disclosure: What does the patient feel and express about herself?
The dimension of their relationship: How does she define the role of the physician in their interaction?
The dimension of application: What does she want the physician to do?

Response to emotions

Emotions correspond to what the patient experiences as an individual [7]. The part of the brain dealing with emotions is the fastest acting part of the brain, and sets the framework for communication and understanding. Therefore, emotions are an important source of information about what is happening inside the patient. This is a difficult task, which needs considerable practise.

There are different models of learning about how to respond to emotions. One of these is a stepwise approach, in which the physician becomes aware of his or her own emotions first, i.e. feeling irritated, sad or helpless.

Then the physician has to try to *perceive the emotions expressed by the patient*, i.e. how does the patient feel?

In the next step, the physician tries to verbalise the emotions expressed by the patient in her/his own mind, i.e. does she feel sad, worried, angry, frustrated, overwhelmed, etc.

Lastly, the emotions perceived by the physician can be conveyed to the patient with deference and sometimes may be expressed as, 'I imagine that this situation may cause a lot of anger and frustration.'

Professional information giving: information exchange

With professional listening and by using specific skills, the physician tries to gain comprehensive information about the patient, which may add to her past medical history, alongside the other types of information that refer to the patient's emotions and relationships. This is an essential starting point for each consultation, and integrates the kind of information usually discarded by those strictly following the biomedical model.

However, the physician does not only receive information; an important part of the work is to give information, educate patients, and empower them, i.e. *an information exchange*. Basic skills are necessary because this information transmission is a cognitive therapeutic act [8].

At the start, the physician should assess the *patient's need for information i.e., What and how much does the patient want to know?*

Then it is important to structure the information by *giving key messages* such as, '*Now I want to tell you something very important, which I want you to understand …*', etc.

The information should be given in *small units using short sentences* with *repetitions*, if necessary. Apart from structuring the interview, it is also important to *allow time for questioning, and to check back* by encouraging such questioning from the start of the conversation, and then checking to ascertain that the patient has understood what has been said about her health condition.

An essential part of information giving is to refer to the patient's experiences during her life by using images and examples, which relate to her and to address different sensory channels, which would include visualisation and her perceptions, along with written information.

A practical model of information exchange is the *elicit, provide, assess*, model. [9]. The steps are as follows:

Elicit the patient's need for information, her expectations from the encounter and her pre-existing knowledge about the subject she would like to talk about.

Provide a defined quantity of information. It is important that the information is given in well-structured, small units, that the important parts are stressed, and that the patient is encouraged to interrupt by direct questioning during the conversation.

Assess the patient's understanding and interpretation of the information provided by enquiring about the clarity of her understanding of the information given to her. For some patients, it is equally important to ask the patient about the emotional meaning she has ascribed to the information that she has received.

To clarify further, the gynaecologist could ask, *'What does this information mean to you? Is it reassuring or is it worrying? Are there any new questions that you have thought of?'*

Communication and counselling in special clinical situations

Breaking bad news

Breaking bad news is typically necessary when providing antenatal care, in fertility clinics or in oncology, or wherever the physician has to give bad news, regarding a diagnosis, management, or prognosis, that can cause sorrow to patients [10].

The physician should prepare for such an encounter, so that it is uninterrupted by external factors (e.g. no radio pager/phone), and also consider whether the patient wants to attend the consultation alone or with her partner/family. It is useful *to show empathy* by using a more personal note, giving a brief summary of the previous encounter/event and the objective of the consultation. The physician should start gently by saying, namely, 'I have to give you some bad news'. This announcement should be followed by a *statement, which gives the diagnosis in words that can be easily understood by the patient*.

The physician should then *wait for the personal reaction* of the patient, namely, being stunned, confused, in denial, shocked, tearful, behaving stoically or being angry at receiving such information.

Perceiving and understanding emotions

By respectfully reflecting on the emotion (either verbally or non-verbally), the physician establishes an 'emotional bridge of contact' and thus helps to create a shared reality and experience with the patient. After this link is established, it is often important to encourage questions and to give further information to the patient, albeit in very small units. Even when there is very bad news, it is important to *give hope*. Giving hope does not mean consoling the patient hurriedly by minimising the possible emotional impact through evasion, and rapidly changing the focus to treatment options, such as prior to a lumpectomy, e.g. 'We do not have to take the whole breast away, anyway …', etc. Giving 'hope' in this context means to give the message that, even in a life-threatening situation, the patient will not be abandoned, and that everything will be done to help her face the bad news.

One could start by saying, 'I do not want to underplay the severity of the situation, but I can assure you that the whole team will make every effort to help you cope with this ….'. The consultation can be ended by informing the patient of the proposed management plan for the near future if she accepts and decides to return for further consultation, after thinking over and discussing with her close family/friend. The physician can define the next steps to be followed, such as giving further appointments, and inviting the partner or close friend/family member to attend.

Risk and decision-making advice

Decision-making advice is frequently required when providing antenatal care: (*what type of examination/screening?*); preoperative care (*consent?*); family planning (*which method?*); infertility (*which treatment?*); incontinence (*medical or surgical treatment?*); cancer management (*aggressive/multimodal?*); menopause (*HRT or other measures?*); termination of pregnancy (*conflict in decision-making*) [8,9].

To provide decision-making advice, it is important to distinguish the two types, namely: '*effective decision-making*', and '*preference sensitive decision-making*'.

In *effective decision-making*, there is a high level of evidence that the benefit largely outweighs the risks or possible harm, and that usually most doctors and patients would arrive at such a decision. An example is prescribing aspirin and lipid lowering drugs after myocardial infarction.

In *preference sensitive decision-making*, there is low or medium quality evidence that the benefit does not clearly outweigh the risks. Hence, the patient's values and preferences contribute to a large extent in weighing up the benefit versus the risk. This is typical for certain aspects of antenatal counselling, consultations regarding menopause, or decision-making in oncology. In more practical terms, the obstetrician/gynaecologist has to learn how to give risk and decision-making advice.

The physician should clarify the needs, values, and objectives of the patient in relation to specific issues regarding the benefits and risks, and the decisions to be made. The physician should elicit the need for information giving, and try to obtain relevant knowledge on the subject-area. The physician then collates the information, structures the risks in a framework, and relates to everyday experiences in treating such patients. It is important to give absolute risk numbers and not to use relative risks and conditional probabilities.

The risk should, if possible, be depicted visually by showing the relationship between the risk, and the possibility of recovery. Where possible, the likelihood of recovery should be stressed. The patient should be encouraged to reflect on her values, and how she gauges the importance of the benefits over the risks discussed with her. With this reflection, new questions may arise, to which the obstetrician/gynaecologist can respond, thus refining the decision-making process.

Decision-making summary

The obstetrician/gynaecologist first clarifies the problem, then gives evidence-based information about the benefits and risks. The obstetrician/gynaecologist encourages the patient to add her values and preferences to the information provided. Finally, the obstetrician/gynaecologist assesses whether there are difficulties in the patient's decision-making, and how to facilitate the decision-making process.

Clinical application of the psychosomatic or biopsychosocial model

This model is necessary [11,12] and useful for the following clinical conditions [13,14] which the obstetrician/gynaecologist may have to face:

- The patient with physical symptoms that cannot be explained by organic pathology (*the psychosomatic or somatoform patient*)

- The patient in whom the response to a disease leads to severe psychological symptoms (*the somatopsychic patient*)
- The patient with mental and behavioural problems, interacting with gynaecological and obstetrical diseases (*the comorbid patient*)
- The patient with sexual and relationship problems (*the sexual dysfunctional patient*).

For all these patients, the psychosomatic diagnostic approach would aid by the integration of psychosocial information into the working hypothesis of the clinical problem. Trainees thus need some knowledge and understanding of the concepts concerning psychosocial pathogenetic factors.

From our clinical experience and the relevant literature, we have developed a mnemonic ('ABCDEFG'), the meaning of which is detailed as follows:

A = Affect

The physician should be aware of a predominantly affective state, such as depression and anxiety, which may be expressed concurrently as dysphoria. This should also include some basic knowledge about the prevalence and the diagnostic methods used for detecting affective disorders.

B = Behaviour

Frequent risk-taking or health-damaging behaviour, play an important part in the pathogenesis or complications of clinical disorders in obstetrics and gynaecology. This is of great significance in obstetrics, where behavioural problems have an important impact on the health of not only the mother but also the child.

C = Conflict

Conflicts can be either external or internal, and can be subdivided into attraction versus attraction, avoidance versus avoidance, and attraction versus avoidance types. To explain further, in the 'attraction versus attraction' conflict, the person has to decide between two tempting options. The decision for one option includes the rejection of the other attractive option, which is experienced as a loss. For example, when an unmarried individual has to choose between two attractive partners, though the individual's circumstances are not yet abiding.

In the 'avoidance versus avoidance' conflict, the individual is confronted by two situations simultaneously, which can cause anxiety or distress. Deciding on one option only may mean selecting the one that is the more painful one. For example, when suffering from a toothache but also being afraid of going to the dentist at the same time; deciding not to go to the dentist, despite the pain.

The 'attraction versus avoidance' type of conflict is the most frequent one. In this, the individual wants to do something, and at the same time he/she strongly feels that he/she should not do it because one of the situations is an enduring option that has been already chosen. In this scenario, the same motivation or situation evokes positive and negative feelings concomitantly, and is further complicated by one of the issues having a permanency. As, for example, when a married man wants a romantic relationship with a woman who is not his wife, but at the same time feels that he should not do so because he is in a permanent relationship through marriage. Such a conflict gives rise to strong mixed feelings because of the unchangeable nature of his existing relationship. It makes the individual unable to decide between the pros and the cons of his contrasting feelings, thereby greatly hampering decision-making.

Chronic unresolved conflicts lead to chronic stress, reduced motivation, depressive and anxious mood, and social difficulties, which may impair health.

D = Distress

Distress describes a condition in which a person is confronted with external or internal stressors, which overwhelm the person's coping capacity. This includes transitional periods in the course of one's life. Distress leads to psychoendocrine, psychovegetative and psychomotor responses, which may be hazardous to the patient's health.

E = Early life experience

This refers to early life events, which may date back to childhood and adolescence. Traumatic experiences may have an impact on neurobiological pathways, which may increase the patient's vulnerability to later stressful life events, and may induce repetitive health-damaging behaviour. Emotional deprivation and neglect may also have long-term consequences regarding the emotional development and interpersonal competency of patients.

F = False beliefs

False beliefs relate to general patterns of thinking such as low self-esteem, pessimism, generalisation, and self-reference, which are likely to increase the vulnerability to life stressors.

G = Generalised frustration

This refers to life situations in which essential needs are unmet. These situations may lead to depression, anxiety, loss of self-esteem, and somatisation.

These psychosocial pathogenetic factors can be arranged in a timeline in the same way as the biomedical factors. When comparing biomedical events with psychosocial pathogenetic factors, the reference to 'past-medical history' in the former would correspond to 'early life biopsychosocial experiences' in the latter. When referring to 'the physical impact of previous diseases', it would similarly correspond to, 'the impact of previous important biopsychosocial life events'. Biomedical conditions resulting from infection, physical pain, benign growth, dysfunctional symptoms, or congenital structural defects, or that from physical injury would parallel the elements of the affective state determined by psychosocial distress/conflict, emotional pain, fixed beliefs, lack of psychosocial support, and unfulfilled needs such as with post-traumatic stress.

The information obtained by this comprehensive diagnostic approach can then be structured and put into what is called the '9-field matrix' of psychosomatic diagnosis (Table 2.1 below). This matrix is characterised by three dimensions in the columns (biological factors, psychological factors, and social factors) and three categories in the rows (predisposing, precipitating, and maintaining factors).

Table 2.1 9-field matrix for teaching how to reach a psychosomatic diagnosis

	Biological	**Psychological**	**Social**
Predisposing	Family risks Pregnancy and birth related risks	Early trauma Abuse Neglect	Broken family Early separation Migration
Precipitating	Disease Drugs Biological transition	Loss Life transition Separation	Migration Cultural norms Social changes
Maintaining	Side-effects of drugs	Anxiety False beliefs Stress responses	Secondary reinforcement by the environment

The final step in the diagnostic work-up is the elucidation of the patient's concept of her disease, as well as her previous coping style and resources.

During psychosomatic training, a comprehensive biopsychosocial diagnosis is presented by the trainee, in the format depicted in Table 2.1; symptoms and problems are portrayed as a descriptive summary *together with* relevant predisposing, precipitating and maintaining biological, psychological and social factors; *additionally, the patient's* concepts and her resources for support are presented.

The application of the biopsychosocial model: therapeutic process

In teaching the therapeutic process, it is important to emphasise that, in many clinical situations, it is useful to add such an approach to evidence-based biomedical treatments such as with drugs, surgery, physiotherapy, and radiation, as well as the specific psychosocial interventions. This would include:

> *Defining the treatment objectives/goals along with a contribution from the patient*, and using the therapeutic power of a helpful patient–physician relationship, specific psychosocial interventions can be applied as needed; this is *supportive psychotherapy*. Due to the usually complex nature of the problems presented by the patient, it is important to follow this approach. The following line of enquiry can be used:
>
> 'What can be achieved and within how much time? What is realistic? Are there alternative objectives? What is the fall-back plan if the objectives cannot be reached?'

It may be useful to help the patient by giving her a quality-of-life scale, which allows self-reporting and self-rating.

The relationship between the patient and the physician represents an important tool for treatment, and could be considered as 'medication'. Each patient–physician encounter confers at least one dosage of this drug because the physician can:

- give stability and help
- empathise and thereby provide a sounding board
- give information and education about her illness
- re-establish her self-confidence and sense of responsibility.

Supportive and/or coping counselling/psychotherapy is a comprehensive approach that can be used for supporting the patient during consultations [15,16].

The therapeutic elements can be summarised under another mnemonic: 'CCRISH'.

Catharsis

The obstetrician/gynaecologist encourages the patient to express her emotions and talk about her feelings (affects). She shares these emotions by non-verbal and verbal reflection, summarising and checking back. The following scenario and the four others interspersed within the text illustrate the type of psychotherapy required to manage these patients.

1. *A 36-year-old primigravida returns for an ultrasound scan at 20 weeks' gestation. The scan shows a missed abortion with fetal structures without a heartbeat. The patient is distraught. The physician encourages her to talk about her emotions and the questions she might have. She reveals that at the beginning of the pregnancy she did not want this child and she was thinking about termination. Now she is convinced that the intrauterine fetal death is God's punishment, and that 'it is all*

her fault'. The physician listens sympathetically. She keeps on talking about her feelings of guilt and her sadness. After a while, the physician responds.

Physician : *'I can imagine the overwhelming pain you feel about the loss of the child, which is further aggravated because you blame yourself. Let me tell you that women can have mixed feelings at the beginning of a pregnancy, and that this ambivalence is a normal feeling. I am very sure that you are not responsible for this death. You should give yourself permission to mourn, and to be supported in this mourning process'.*

Clarifying of conflicts and conflict resolution

The general principles of conflict clarification and resolution:

- Clarifying the individuals' views of the problem and the related causes
- Increasing the understanding of biographical factors influencing these views
- Delineating and verbalising the elements of the conflict
- Brainstorming about possible options of conflict resolution
- Help in conscious and transparent decision-making.

2. *A 35-year-old female suffers from complete loss of libido, which creates a profound conflict with her partner, who feels a passionate sexual desire. During the session with the couple it becomes evident to the male partner that her previous traumatising sexual experiences have conditioned her aversive reactions to his expression of intense desire; she finds his advances as threatening and aggressive. After encouraging her to verbalise her sexual wishes and needs, which are much more directed towards non-penetrative sex, both can start to negotiate about new ways of sexual expression and encounters.*

Cognitive reframing

By reframing the cognitive attributions given by the patient to her disease or her symptoms, the physician may attenuate the emotional distress caused by the catastrophic and pessimistic explanatory styles of some patients.

3. *A 22-year-old nullipara suffers from chronic pelvic pain, which could not be explained by laparoscopic findings. After the operation, the physician explains the results. The patient is silent and withdrawn.*

Physician: 'This must be somehow disappointing for you, that we could not find a cause for your pain, despite investigating. I understand that it is bothering you a lot. You might have the impression that we do not understand your suffering'.

Patient: 'Yes, this is so frustrating. Do you think that the pain is just in my head … pure fantasy …?'

Physician: 'Not at all. We know that this pain is real, but that the causative factors are complex, as we have discussed before. We were talking about chronic pain as the result of a disturbed processing of signals coming from certain body regions …'.

Insight and understanding

A patient can gain increased insight and understanding of her symptoms, and problems through information provided by the physician or though discussions regarding the patient's self-image, her view of the world, and ways of coping. Through this dialogue, the patient may be enabled to correct destructive and distorted patterns of thinking and behaviour.

4. *A 52-year-old patient had undergone treatment for mammary carcinoma with lumpectomy, radiation, and adjuvant anti-hormonal treatment. She feels abandoned by her husband and her family, and develops a depressive mood. The physician tries to clarify with her regarding the expectations she has from her family. By verbalising her wishes, it becomes apparent that she had never expressed her anger and frustration about her disease, and the recurring beliefs that injustice was imposed on her by fate or God. She gains some insight into the influence of her own behaviour on being distanced by her family. She is then able to adapt her expectations to the outlook of her family.*

Stress reduction techniques

Distress is experienced if the challenge (threat or change) imposed on a person cannot be confronted or handled satisfactorily. The distress is reflected at the cognitive level by the lack of a solution, on an emotional level by the experience of anxiety and helplessness, and on the physiological level by the activation of the sympathetic system and the endocrine response of the adrenocorticotrophic hormone (ACTH)-cortisol axis. Stress reduction techniques are based on the following elements:

Cognitive level: Reframing, reducing catastrophic thinking, and searching for solutions
Emotional level: Creating awareness of the sequence between events, thoughts, and emotions in order to be able to modify affective responses
Physiological level: Breathing techniques and progressive muscle relaxation.

5. *A 36-year-old patient and her partner are given assisted reproduction with ovarian stimulation, ovum-pickup, fertilisation, and embryo transfer. After two failed treatment cycles, the female patient exhibits a strong vegetative reaction during the ultrasound evaluation of the ovarian response; she starts crying, and reports heart palpitations and a headache. The physician teaches her some basic breathing techniques to help her cope. In another consultation, her way of coping with the treatment is analysed, showing the enormous pressure she puts on herself, and the anxiety that she develops in anticipation of a possible treatment failiure. In a counselling session with the couple, different ways of coping are discussed. Modifying the 'fixed' objective of a 100% success rate, defining a plan B, building up compensatory activities, and initiating the practise of a relaxation technique. All this she considers as helpful in reducing her anxiety so that she can continue with the management plan laid down for her infertility.*

Helping in behavioural change

In many clinical situations, the focus lies on the necessity for behavioural change. In order to accrue health benefits, patients are advised to stop smoking, lose weight, increase exercise, and adhere to the treatment guidelines. In many instances, such behavioural change is not accomplished.

The model of Prochaska and Di Clementi is helpful in understanding better the different phases which have to be passed through when a person has to change behaviour [16].

In the phase of *pre-contemplation*, the patient is not aware of any need to change behaviour, and is oblivious of the risks.

In the phase of *contemplation*, awareness has been established in the patient about why the changes are necessary. At the same time, the behavioural status quo of the patient is seen as being advantageous with a change in behaviour having long-term benefits to the patient, and this is emphasised. This phase is characterised by a cognitive weighing of pros and cons, and an internal comparison between the status quo and the consequences of change.

In the phase of *preparation*, the ambivalence of contemplation has been overcome and there is an *action plan for change*.

This action plan for change is put into manifest behaviour in the phase of *action* and if the new behavioural sequence is repeated, the patient has reached the phase of *maintenance*. After several repetitions, the phase of maintenance is transformed into a *new habit* as the patient adapts to the change of behaviour.

It is important to realise that during *each phase the patient may regress into a previous stage*. For the physician providing the counselling it is important to recognise that each phase needs a specific type of communicative intervention.

According to this model the readiness for change is determined by two main factors:

a. *The perceived importance of change for the patient*: in other words, the answer to the patient's question, 'Why should I change?' this includes information about personal values, expectations, and estimates of the importance of the need to change.

b. *Confidence in the patient's own ability to change*: in other words, the question 'How can I change?', this has a lot to do with her beliefs regarding her capabilities and self-sufficiency. Motivation in this context is everything the patient does to increase her self-worth and confidence. The trainee is next taught about how to practise motivational interviewing [9] by assessing those two factors.

The main elements are the assessment of the patient's readiness for change, which is determined by the importance she attributes to changing her behaviour, and her confidence in her capacity to carry out this change. Depending on the patient's degree of readiness, the physician can either adjudicate issues of importance and confidence or elaborate a detailed plan for change.

Assess importance: '*How important is it for you on a scale from 0 to 10 (0 meaning not at all and 10 meaning very important) to change the present behaviour*?'

Assess confidence: '*If you could decide now to change your behaviour, how much confidence do you have that you can do it on a scale from 0 to 10, (0 meaning no confidence at all and 10 meaning a maximum of confidence)*?'

Assess readiness: '*How ready are you on a scale from 0 to 10 to change*?'

After receiving answers from the patient, the obstetrician/gynaecologist can explore different aspects regarding the importance of the change for the patient, including her confidence in making this change; the obstetrician/gynaecologist can enter into a patient-centred communication and discuss how to achieve this objective.

The obstetrician/gynaecologist may ask, *'What would have to happen that this change in behaviour becomes more important to you at a certain point, that is, going from 5 to 6 or 7*?'

During this discussion, the internal process of ambivalence can be made more explicit and the pros and cons along with the short- and long-term consequences can be looked at. Eventually the physician and the patient can make lists with a diagrammatic representation, to action various aspects of the plan for a behavioural change. Doubts and concerns can be clarified as change is anticipated.

It is very important that success and failure of the attempt to change behaviour can be discussed in case-conferencing. 'What did help? What were the difficulties?' are important questions to ask during the relevant case discussions, and one should attempt to get answers with probity.

Some patients who have achieved success with counselling may relapse. One of the most important skills to be learnt is how to deal with relapse. Any relapse case should be included in a learning objective and some soul-searching applied. Enquiries should address, 'What has happened? What could be learnt from the relapse?'

Dealing with the relapsed patient is not about reproach, but about insight and learning. She should be assured that she is not an exception in having a relapse. Besides, she should be informed

that some patients have to go at least 5–10 times through the process of behavioural change with repetitive relapses, until they finally stabilise at the maintenance stage.

Psychosomatic education and training

The reader's understanding of the psychosomatic diagnosis is enhanced by practise (see, Appendix). When providing training for applying the psychosomatic approach to women's healthcare, the basic elements of counselling are taught in two teaching sessions, each of 4 hours' duration. After these sessions, educational videos are used to show the different interventions in various clinical settings. The trainees then practise these techniques in 4–5 videotaped sessions, with simulated patients. Such training can be developed in different medical institutions interested in teaching 'Clinical Psychosomatic Obstetrics and Gynaecology'. This would help provide patient-centred psychosomatic care in various clinical settings, from the challenges of infertility and pregnancy to the ills of the menopause.

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Chapter 3

Maternal mood in pregnancy: fetal origins of child neurodevelopment

Vivette Glover, Thomas G. O'Connor, and Kieran J. O'Donnell

Introduction

This chapter reviews some of the evidence that shows that the emotional state of the mother during pregnancy can have long-lasting effects on both fetal and child development, especially neurodevelopment. Much attention both in the scientific literature, and in the media, has been given to postnatal mental illness. The mental health of women during pregnancy has been relatively neglected. While parturition does act as a trigger for both postnatal psychosis, and the relatively mild 'blues', symptoms of both anxiety and depression are actually higher during pregnancy than postnatally [1,2]. Several studies report that domestic violence in pregnancy is also common and can have a detrimental effect on fetal growth [3,4]. All this is important not only for the distress that it can cause the mother herself, but also for the development of her child.

The developmental origins of adult disease, an idea often called the 'Barker hypothesis' is based on the well-reproduced finding that people with lower birthweight, even those within the normal range, are at greater risk for developing disorders such as coronary heart disease and type 2 diabetes, when they are adults [5]. Thus, undernutrition of the fetus can have a permanent effect on the child. Animal experiments have further explored the effects of nutrition on offspring development and shown how nutrition deficiency during pregnancy can have long-term effects independently of birthweight. Such effects on cardiovascular function are observable with a protein-restricted diet given to the mother through gestation [6], and even during the period of oocyte maturation prior to mating [7]. Prenatal nutrient restriction has also been shown to affect the cardiovascular system, and stress responses of the second generation [8]. Other research in animal models, has shown that a mother who is obese throughout gestation and lactation, produces offspring who are prone to obesity and cardiovascular and metabolic dysfunction [9]. There is recent evidence that the brains of such offspring are also altered, resulting in worse cognitive performance [10]. Thus, very early undernutrition or overnutrition may have long-term effects. These studies, which build on the original Barker hypothesis, also confirm the long-term effects of different early environments.

Fetal programming is the concept that the environment *in utero*, during different critical periods for specific outcomes, can alter the development of the fetus, with a long-term effect on the child. It has been suggested that this mechanism may have been of evolutionary value, in order to prepare the offspring for the environment in which s/he will find themselves. However, in the modern world, there may often be a mismatch between early exposures and demands for later adaptation, and the prenatal physiological changes may make the offspring vulnerable to the development of health problems later in life [11].

Prenatal stress: animal studies

It has been known for over five decades, from animal studies, that maternal stress during pregnancy can have a range of long-term effects on the offspring [12]. Some of these effects are described in Table 3.1.

Table 3.1 Prenatal stress and impact on offspring: animal studies

Outcome	References
More anxiety	[12]
Reduced attention	[13]
Learning deficits	[13]
Reduced laterality	[12]
Altered sexual behaviour – males feminised; females – less maternal	[12]
Altered immune function	[14]
Increased cardiovascular response to stress	[15]
Altered pain responses	[16]
Increased HPA axis response	[12,13]

HPA, hypothalamic–pituitary–adrenal axis.

In the case of animals, it is possible to cross-foster the prenatally stressed pups to control mothers after they are born or nursery-reared, as observed with monkeys [13], and thus establish that effects are caused prenatally rather than postnatally.

Prenatal stress in rats has been linked with a wide range of outcomes, including altered immune function [14], pain responses [16], and cardiovascular function [17]. Altered cerebral laterality, and abnormal sexual behaviour have been described [12]. Even so, the most widely reproduced effects are on cognition, including reduced memory and attention, besides increased anxiety and emotional dysregulation.

Work with non-human primates has identified brain structures altered by prenatal stress. Coe and co-workers [18] have shown that exposure to unpredictable noise, either early or late in pregnancy, resulted in a reduced volume of the hippocampus in the offspring. This is a part of the brain that is important for memory. The responsiveness of the hypothalamic–pituitary–adrenal axis (HPA), which produces the stress hormone cortisol, was increased in the offspring. Prenatal stress can also act synergistically with other toxins, such as lead, to have a long-term effect on the function of the HPA axis [19].

One notable result with the animal studies is that the effects of prenatal stress on male and female offspring are often different [20]. Learning deficits are more readily seen in prenatally-stressed males, while anxiety, depression, and increased response of the HPA axis to stress are more prevalent in females. Much animal research has traditionally been carried out only on males to avoid the confounds of the different phases of the oestrous cycle. It is important not to assume that the effects of stress on males and females will be the same.

Maternal stress induced even before conception, can have a long-lasting effect on the affective and social behaviour of the offspring [21]. The timing of the stress during pregnancy can also affect the outcome [22]. This is not surprising, as different parts of the brain are developing at

different stages of gestation, and may be more susceptible to specific environmental influence at different times [20].

Another important finding in animal research is that programming effects can last until the generation of the grandchild [23]. In one experiment where the pregnant female was treated with dexamethasone, which acts in the same way as the stress hormone cortisol, the effects were even transmitted to the second generation by the first generation male offspring [23]. This suggests the possibility that epigenetic changes can affect both the oocyte and the sperm.

Rodent experiments have also established that the early postnatal environment and maternal behaviour can have permanent effects on the offspring. The effects of prenatal stress may be moderated, and even reversed by positive postnatal rearing. This suggests that, although there can be persisting effects of prenatal stress, it is not inevitable in all who are exposed [24].

Meaney and his co-workers have shown how variation in the nature of maternal care can have long-lasting effects on the behaviour of the offspring, and they are uncovering some of the epigenetic changes in the parts of the brain, which underlie this [25,26]. Less nurturing parental care can also reduce the age of puberty, increase sexual activity, and reduce the age at first pregnancy [27]. Nonetheless, rodents are born at a stage equivalent to the human late-fetus, and so it is not clear whether these effects are translatable to the prenatal or postnatal stages in humans.

Conti et al. [28] have observed, for over five decades, the early rearing behaviour of rhesus monkeys (*Macaca mulatta*), and followed their babies' growth into adulthood in their natural environment, within a supportive family structure. They compared this with the rearing of these monkeys outside their natural surroundings but without the supportive maternal and family care, and observed a negative impact. When artificially reared outside a supportive family structure, the baby monkeys are stressed and develop into insecure 'teenagers' who have less confidence. They cling to each other, develop into vulnerable adults with behavioural problems, and are unwilling to face the challenges of the outside world, in contrast to those who are reared naturally. Cole et al. [29] have also reported changes in the expression of specific genes in the stressed offspring of artificially-reared infants. It is unknown if such changes in gene expression can be reversed if these infants are transferred into an environment with a stable family structure and nurturing caregivers.

The findings from animal research need to be translated for human health and development. Although there may be some conservation across species, there may be distinct as well as common mediating biological mechanisms, which explain the effects of prenatal stress on behavioural outcomes in animals and humans. We need to be aware that there are obviously many physiological and other differences between humans, and animal models. Rodents are born at a much less developed stage than humans, whereas maturation rates of most developmental processes in rhesus monkeys are four times that of humans. Nevertheless, animal experiments have provided strong evidence that prenatal stress can have long-lasting, and varied effects on the offspring, that the effects depend on the sex of the fetus and the timing of the exposure, and that they can be modified by varying the nature of the postnatal care.

Prenatal stress: human studies

An immediate link between antenatal maternal mood and fetal behaviour is well-established from 27–28 weeks of pregnancy onwards [30]. For example, if the mother carries out a stressful task such as mental arithmetic or the Stroop test, the heart rate of her fetus changes, especially in more anxious women. The mechanisms underlying this are not fully understood.

In the last ten years, several independent prospective studies have examined the effects of antenatal stress, anxiety, or depression on social/emotional, and cognitive outcomes during childhood. Even though these studies used a wide range of methods, both for measuring antenatal stress or

anxiety, and for assessing the child, they all support a link between prenatal mood and the development of the fetal brain [30,31]. Different studies have examined the child at different ages, from newborn to adolescence. The newborn studies show effects that must be independent of postnatal experience; those with adolescents show the persistence of impairment [30,31]. In several studies, these findings have been shown to be independent of maternal postnatal depression and anxiety besides other potential confounding variables such as smoking or poverty. The studies are mainly European and North American [32–34]; very few are from middle/low income countries or countries at war, where one might predict that the effects could be even more marked. Some of the different outcomes that have been shown to be reliably associated with prenatal stress, anxiety, or depression are shown in Table 3.2 below.

As in animal studies, a wide range of different outcomes have been found to be affected by prenatal stress. Several studies have shown links between antenatal stress or anxiety and behavioural/emotional problems in the child. The most consistent adverse outcome is in the presentation of symptoms of attention deficit hyperactivity disorder (ADHD) [35–37], but an increase in anxiety is often observed [35,37]. Other studies show an effect of prenatal stress or anxiety on the cognitive development of the child, as assessed by scores on the Bayley Mental Developmental Index (MDI) [38,39], or language development [32].

Three studies have shown an association between antenatal anxiety or stress, and more mixed-handedness in the child [40–42]. Atypical laterality has been found in children with autism, learning disabilities, and other psychiatric conditions, including problems with attention, as well as in adult schizophrenia. There is evidence for a link between antenatal maternal stress and autism [43], and anecdotal evidence for dyslexia, in addition to the evidence discussed for ADHD [35]. It is an interesting possibility that many of these symptoms or disorders, which are associated

Table 3.2 Prenatal stress, anxiety/depression, and child outcomes: human studies

Outcome – increased levels of	References
Anxiety	[35,37,39]
Depression	[35,46]
Behavioural problems including ADHD and conduct disorder	[35–37,46]
Impaired cognitive function	[32,39]
Schizophrenia	[45]
Autism	[43]
Sleep problems in infancy	[47]
Asthma	[48]
Fibromyalgia	[49]
Mixed-handedness	[40–42]
Dermatoglyphic asymmetry	[44]
Reduced birthweight	[50]
Altered HPA axis regulation	[51,52]

ADHD, attention deficit hyperactivity disorder; HPA, hypothalamic–pituitary–adrenal axis.

with mixed-handedness, share some neurodevelopmental components in common, which may be exacerbated by antenatal maternal stress or anxiety.

A notable study has shown that prenatal maternal stress, due to exposure to a Canadian ice storm, during the fetal period of fingerprint development, resulted in greater dermatoglyphic asymmetry in their children [44]. This asymmetric pattern has also been found in subjects with schizophrenia.

More needs to be understood about the exact period of gestation, which is most important for all the effects described here. Different studies have found different periods of vulnerability. It is clear that the effects are not confined to the first trimester. Although the basic body structures are formed early, the brain continues to develop, with neurones making new connections, throughout gestation, and indeed, after birth. In the study of O'Connor et al. (2002), anxiety was measured at 18 and 32 weeks' gestation, and the associations were stronger with the latter time point [35]. However, in the study showing that a life event, i.e. the death of a relative, was associated with an increased risk of schizophrenia, the risk was confined to the first trimester [45]. It is likely that the gestational age of sensitivity is different for different outcomes. Brain systems underlying different aspects of cognition or behaviour mature at different stages. The level of increased risk is often about double the population risk, but this still implies that most children are not affected. However a substantial proportion, 10–15%, of the risk for behavioural and emotional disorders, may be attributable to prenatal anxiety or stress [31].

Findings from the Avon Longitudinal Study of Parents and Children (ALSPAC) cohort, a longitudinal, prospective UK study of pregnant women in the community [47,48], show that prenatal maternal stress may affect the offspring in different ways. For example, the first investigation [47] analysed the data gathered from mothers to assess anxiety and mood symptoms at 18 and 32 weeks' gestation besides those at 8 weeks and 8 months' postpartum. In addition, sleep patterns of the offspring were evaluated at 6, 18, and 30 months. A link was found between anxiety and mood symptoms during pregnancy with night-time awakenings, and sleep disturbances in infants at 18 and 30 months of age. In a second report from the ALSPAC data [48], a link of doctor-diagnosed childhood asthma with maternal anxiety and/or depression was investigated. The authors concluded that prenatal anxiety at 32 weeks, an indicator of stress, could result in fetal programming that could lead to childhood asthma between 6½–7½ years of age.

Klingmann et al. [49], discussed prenatal sex-specific programming and the occurrence of fibromyalgia, which is 4–8 times more common in females. They suggest that maternal stress during pregnancy could affect the adrenocortical response possibly mediated by impaired development of the adrenal cortex, particularly in female fetuses. As such, when faced with stressful events in life, such adrenal insufficiency glands may not release the necessary glucocorticoids to counteract the effects of catecholamines and proinflammatory cytokines (see Chapter 1), which modulate the brain's function. These individuals could then show an enhanced response to both external and internal painful, and fatigue-eliciting stimuli.

It is still not known why some children are affected by their mothers' prenatal stress, anxiety, or mood symptoms but not others. Possible explanations include specific genetic vulnerabilities in both mother and child, timing of the prenatal exposures, and the nature of the postnatal care.

Types of stress

The effects described are not specific to one type of stress or anxiety. Little is known about the types of anxiety or stress, which may be most harmful for fetal development. Generalised anxiety, panic, specific phobia, post-traumatic stress, acute stress, and obsessive-compulsive disorders may involve quite different, or even opposite, physiological processes. It is notable that, whereas

prenatal maternal anxiety has been found to be associated with raised cortisol in the child [51,52], maternal exposure to the trauma of 9/11 was found to be associated with low cortisol levels in the infant [53]. Moreover, anxiety in general is associated with raised cortisol but post-traumatic stress disorder (PTSD) is associated with reduced cortisol [54]. Complicating this further is the rate of comorbidity in these conditions in clinical and population samples.

Most of the studies have used maternal self-rating questionnaires, some having used anxiety questionnaires, while others have applied other measures of stress [35,37]. Some studies assessed daily difficulties [38], whereas others focused on life events [55]. Some have followed up exposure in pregnancy to an external trauma, such as the severe Canadian ice storm [32], the Chernobyl disaster [46], or the 9/11 disaster in New York [53].

In a Danish study by Khashan et al. [50], information about mothers of singletons (n = 1.38 million) gathered over a three-year period, were linked to that of their spouses, parents, siblings, and older children, in order to assess the effect of severe life events on birthweight. It was found that if severe life events, such as serious illness/death of a close relative, occurred during pregnancy or six months prior to it, babies were of significantly lower birthweight, i.e. below the 10th or 5th percentile. The authors surmised that if this association was causal, it could be because the maternal exposure to stress resulted in dysregulation of the HPA axis or had affected their lifestyles, which in turn impacted on fetal growth.

Many neurodevelopmental effects can be observed with relatively low levels of anxiety or stress [35]. There are two major methodological lessons from these studies. The first is that the nature of the risk phenotype is not yet clear and is likely not to be a very specific clinical condition, such as generalised anxiety, for instance. The second is that the effects are not confined to clinical extremes, such as a disorder, but are evident across a range of scores, although the precise dose–response pattern is not yet clear.

In contrast to most of the findings, one study has found that in a cohort of financially, and stable middle- to upper-class sample of women, there was a small but significant positive association between antenatal stress, and the mental as well as the physical development of the child [56]. The authors suggest that a small to medium amount of antenatal stress may actually be helpful for the development of the child, although this remains to be replicated.

It is worthy of note that the life events found in one study to be most linked with both low scores on the Bayley Mental Developmental Index and increased fear reactivity, were 'separation or divorce' and 'cruelty by the partner' [39]; both stresses could be prevented/minimised by behavioural change. This finding is similar to the conclusion by Stott [57] that continuing personal tensions (in particular, marital discord) were a particular risk factor for later 'neurological dysfunction, developmental delays and behaviour disturbance' in the child.

The high co-occurrence of symptoms of anxiety and depression raises questions about the specific predictions from maternal anxiety. There is some evidence that the effect on the child derives more from prenatal anxiety than depression. O'Connor et al. [35] found that, although antenatal depression was associated with child behavioural problems in a similar way to prenatal anxiety, the effect was smaller. Furthermore, when prenatal anxiety was included as a covariant, the association with depression was not significant. In contrast, the link of prenatal anxiety to child behavioural problems was substantial, and this association was not reduced when prenatal depression was covaried [58].

Thus, the current evidence suggests that the risk most closely linked with adverse child neurodevelopmental outcomes is prenatal maternal anxiety/stress, although depression may also have an impact [59]. There is evidence that the effects on the child are not restricted to extreme anxiety or stress in the mother, but can also occur along a continuum of stress or anxiety [35].

Underlying mechanisms

In animal models, increased fetal exposure to glucocorticoids such as cortisol has been found to be one mechanism for such fetal programming [12,13] causing adverse neurodevelopmental outcomes with gender differences in responses [60], although other systems, including dopamine and serotonin, have also been shown to be involved.

A hypothesis for the central underlying mechanism in humans is shown in Figure 3.1. This suggests that if the mother is stressed, anxious, or depressed, her cortisol level is increased, that this results in increased transplacental passage to the fetus, and that increased exposure of the fetal brain to cortisol results in altered neurodevelopment. Each step of this has been examined. The maternal HPA axis becomes desensitised to stress as gestation advances [61], so that the association between maternal anxiety and cortisol level is weak, especially in the second half of gestation [62]. In later pregnancy, there may be more of an association between maternal anxiety, and evening rather than morning cortisol, but here again, the reported association is weak [63]. Thus, the evidence for the first part of the hypothesis remains inconclusive.

It is known that there is a strong correlation between maternal and fetal levels of cortisol [64], suggesting that there is passage of cortisol across the placenta, at least from 18 weeks' gestation. This is despite the activity of the enzyme 11β-hydroxysteroid dehydrogenase 2 (11β-HSD2) in the placenta, which metabolises cortisol. This correlation is increased with higher maternal anxiety [65], suggesting that placental function can be altered by the emotional state of the mother, and this can regulate the amount of cortisol that reaches the fetus. Thus, it is possible that if the mother is more stressed or anxious, more cortisol reaches the fetus independently of an increase in maternal cortisol. However, the mechanisms underlying the fetal programming effects of maternal prenatal stress have only just started to be studied in humans, and much remains to be understood. Figure 3.1 illustrates a hypothesis to explain the effects of prenatal stress on fetal neurodevelopment.

Braithwaite et al. [66] have reported that prenatal depressive symptoms can predict increased DNA methylation of *NR3C1,* which encodes the glucocorticoid receptor, in buccal cell samples collected from infants at 2 months post-partum. This association was only observed in males. The authors found no association between maternal antenatal cortisol levels and infant DNA

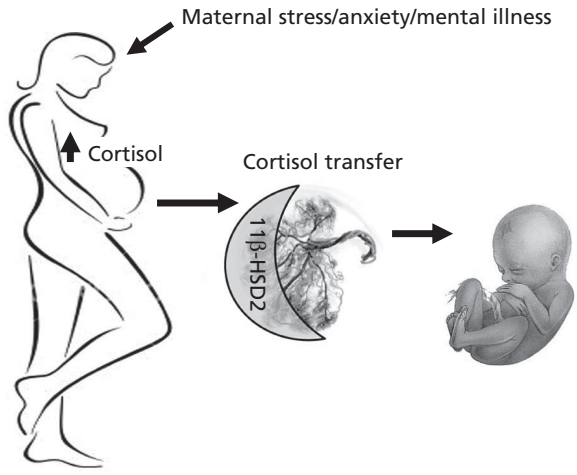

Figure 3.1 Prenatal stress and fetal neurodevelopment—a possible mechanism.

methylation, which suggests the need to consider other molecular mediators to explain any association between maternal antenatal mood and offspring DNA methylation.

Conclusions

The implications of raising awareness of this research are to emphasise that the emotional state of the woman during pregnancy should receive more clinical attention, both for the sake of the woman herself, and for the development of her future child. As well as diagnosing such disorders, practitioners should assess common concomitant problems such as domestic abuse and other forms of stress, which the woman may be experiencing, and arrange for appropriate intervention. Although the effects of prenatal stress or anxiety on the child's emotional/behavioural problems are clinically significant, it is not yet possible to identify, which fetus/child will be affected. The negative effects of maternal stress in offspring, from low birthweight and sleep disturbances in infancy to problems with cognition/learning or asthma/fibromyalgia, may be reduced if childbearing-related stress is detected early, and managed appropriately. Ongoing research on this subject area should be promoted further, and translated into clinical application.

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Chapter 4

Preconceptual to postpartum mental health: mental illness and psychosomatic disease

Mira Lal and Roch Cantwell

Introduction

Since ancient times, societies have given an elevated status to the woman who is fertile (see Chapter 1), and can bear a child. Hence, a satisfactory pregnancy outcome ending in a healthy mother with child, has the potential to promote positive mental health in the mother, and consequently in her infant. Women are also at greatest risk of suffering from mental ill-health when fulfilling their various personal and social obligations during their reproductive years. They are at particular risk when childbearing. It is the psychological readjustments, social challenges, neurohormonal, and physiological changes that occur when pregnant, during parturition, and in the postpartum period, which contribute to this risk. The consequences of mental ill-health during pregnancy and the postpartum, whether pre-existing or acquired when childbearing, may be severe, resulting in a negative somatic impact. This can progress to psychosomatic disease, which may cause maternal biopsychosocial morbidity that could lead to grievous harm.

The UK, which has been the forerunner globally of gathering data and auditing maternal and infant mortality statistics with a view to improving maternal and child health, has shown a rising trend in biopsychosocial maternal morbidity leading to mortality. Suicide has been among the leading causes of maternal deaths in the UK [1–5] and psychiatric factors are implicated in a further significant number of deaths in pregnancy and the first postpartum year. The recent report on surveillance of maternal deaths in the UK [1], released on 8 December 2015, confirmed that maternal mental illness has played a major part in the indirect causes of maternal deaths. Therefore, current statistics add to those reported for the previous four triennia by the Centre for Maternal and Child Enquiries (CMACE) [2], previously known as the Confidential Enquiry into Maternal and Child Health (CEMACH) [3–5]. That there have been missed opportunities to act reflects the need for psychosomatic awareness in professional training and healthcare provision. Hence, from conception onwards, and where possible even prior to it, the presence of any mental illness, particularly anxiety and depression, should be evaluated as suggested by the history. Adequate management would prevent severe morbidity and long-term sequelae. Additionally, the detrimental effects of psychosomatic illness not only affect the mother [6] but also may affect the fetus (see Chapter 3). Maternal illness prevents adequate mothering, and can cause developmental delay in the infant [7] that is further aggravated by social interactions.

The exacerbations by social circumstances along with the effect of mind–body interactions can generate psychosomatic clinical conditions that thwart optimal obstetric outcomes. This is more so in those who have unplanned pregnancies or have partners who are unemployed [3] or socially

excluded [5]. Health professionals who look after pregnant women have an important role in identifying women at risk. Early advice or intervention can prevent progression to severe symptoms, and long-term morbidity [6,8,9], with dire consequences. After a brief mention of the physiological adaptations during childbearing, this chapter moves on to epidemiology, aetiopathology, presentations, and management of psychosomatic diseases resulting from childbearing-related physical, mental, and social ill-health. Understanding is further enhanced by clinical vignettes based on real-life encounters from British maternity units. This chapter also introduces acute-on-chronic psychosomatic disease, with which obstetricians may have chance encounters. These, even though perplexing to the unfamiliar, may require urgent attention from them. Improved understanding of such clinical encounters should aid in providing appropriate patient-centred care that would benefit the mother–baby dyad. Although it is desirable that non-pharmacological treatment is considered first, provision of such services needs further expansion to be universally accessible, e.g. it may not be applicable in medical emergencies, particularly if life-threatening. In these circumstances, pharmacotherapy has to be added or considered as the first-line treatment besides the need for admission to a mother–baby unit that is contemplated for those with more serious mental illness. Furthermore, specialist input is obligatory in the selection/continuation of the appropriate psychotropic drug, its timing, and its dose. It behoves careful scrutiny, if the prescribed drug crosses the placenta, and could be teratogenic.

Normal physical and emotional changes of childbearing and mental illness

Childbirth is an eagerly awaited event for most women, with changes in appearance and emotions accepted as part of getting pregnant. However, some 50% of pregnancies are unplanned, and a proportion unwanted. Frequencies vary, depending on the heterogeneity of the populations studied. It is recognised that sociocultural attitudes towards pregnancy may differ among different communities. Even where pregnancies are much wanted, ambivalence about the pregnancy, health-related anxieties, and fears about an inability to cope with new responsibilities may surface. This is more so in nulliparae. Nonetheless, these feelings are usually considered as normal. Increased emotional lability is common in the first trimester, and may be aggravated by the physical changes typical of early pregnancy. The adaptation of organ systems to the pregnancy may result in minor disorders, such as nausea and vomiting, or a craving for unusual food. These symptoms usually remit by the end of the first trimester. Later, as the pregnancy advances, further exaggerations of normal physiological functioning [10,11] can occur. These can manifest as breathlessness with an increased respiratory rate, a raised pulse rate along with dizziness and palpitations, or an increased urinary frequency with impaired bladder control. Heightened perception of these manifestations of organ function that is modified by the physiological changes of pregnancy, may make the pregnant woman uncomfortable, and may make her restless. This may confound the examination findings of the health professional who examines the gravida to exclude a pathological condition but is less aware of the presentations of the vicissitudes of mind–body interactions.

An example of such a clinical explanation relates to the understanding of perceived pain. Pain during childbirth, as also during pregnancy, is magnified by emotional stress, and skeletal muscle tension. Thus, the pregnant woman's heightened perception of pain could make her confuse the physiological tightenings of Braxton Hicks contractions with pathological preterm labour. Self-induced relaxation is purported to reduce the perception of the severity of pain by interrupting the cycles of tension and pain [12]. Also, at the onset of pain there is a release of pain-producing substances that can generate anxiety with its neuroendocrinological impact, which can restrict fetal growth [13,14]. Hence, effective strategies to help the

pregnant woman cope with the pain and the resultant anxiety generated should be encouraged by health carers. However, this is an over-simplistic view, as the mother's concern about the childbirth, and her baby's well-being, if excessive, could also contribute to the perceived physical discomfort along with her continuing anxiety.

Soon after delivery, and up to 48 hours postpartum, there can be an elevation of mood with difficulty in getting to sleep due to the excitement following a successful delivery—known as the 'pinks'. Again, in about 80% of mothers around two weeks after delivery, there may be low mood with tearfulness, dysphoria, subjective confusion, and sleep disturbances, known as the 'blues' [8]. Both of these last a few days, and resolve spontaneously. Such emotional and physical changes are related to the psychological and physiological readjustments occurring during pregnancy, which continue into the postpartum period. Postpartum blues are also related to psychosocial factors, including the mother's relationship with the baby, support from the baby's father, care from attendants, the mother's experience of delivery, and her expectations from motherhood. Conflicting reports of hormonal changes, such as a fall or rise in the levels of oestrogens and progesterone, a raised prolactin level, raised cortisol level, or low noradrenaline, thyroxin and triiodothyronine levels, are said to be associated with the blues [15,16]. Genetic factors may make some women more vulnerable than others. A link between early postpartum mood, and postpartum depression has been reported [17].

It is important to be able to distinguish the manifestations of physiological adaptations during pregnancy and postpartum from the symptoms more clearly associated with physical and mental illness. Generally, the overall effects of the adjustments to pregnancy and its management, including the emotional impact of antenatal screening along with any suggested invasive procedures besides any medical diseases, may bring about a plethora of anxiety and mood symptoms. These can manifest as somatic complaints that are difficult to classify as normal pregnancy adaptations. Somatic symptoms generated by such experiences can magnify apprehension about pregnancy outcomes in the pregnant woman, and worry could reach attending health professionals. This can inadvertently amplify anxiety brought about by relevant antepartum discussions. Similarly, where the pregnancy outcome is expected to be unsatisfactory, as when the woman decides to continue with a pregnancy despite knowing that she is carrying an abnormal fetus, anxiety can occur and generate psychosomatic manifestations. This may include stress-related cardiorespiratory symptoms, such as mild systolic hypertension, hyperventilation, and sleeplessness. The experience of a previous disappointing pregnancy outcome, or discussions with family members or peers who have had unfavourable outcomes, can also generate stress and apprehension. Anxiety is also magnified in those who are vulnerable, by watching negative portrayals of childbearing in the media [18], and by reading online literature. Conversely, positive maternal mental health can be promoted by a good experience of delivery that is facilitated by being part of the informed decision-making process that is required for managing the pregnancy. This could include antepartum consultations regarding the woman's choice for analgesia or preferred form of support when in labour. It could take the form of discussions to help her select from the available analgesic options, ranging from psychoprophylaxis/hypnosis to inhalational, regional, and systemic anaesthesia, or her decision about the presence of a constant companion in labour. Preparing the pregnant woman to accept any alteration in her initial labour plan, when exposed to the ever-changing scenario in labour, would promote positive mental health by minimising the disappointments from failed, inflexible expectations.

Equally, biopsychosocial issues can influence how a woman experiences her pregnancy [19], how she faces delivery, or perceives the puerperium, and adjusts to her relationships [20]. These

factors would also have an impact on fetal well-being and can impinge on the child's growth and development [21,22].

Impact of childbearing on social health in relation to mental illness

Personal and social health during pregnancy and the postpartum relate to the mother having a healthy relationship with her partner, her child, other relatives and friends, being able to participate in domestic and leisure activities, and resume her previous employment [20,23], if she chooses to do so. This would call for interpersonal reorganisation and adaptation because of the change in lifestyle necessitated by childbirth [24]. A reproductive maladaptation from one generation to another could occur [25,26]. The first childbirth is different from subsequent ones [24], not only by definition, but also in terms of the woman's own account of her obstetric experiences. The adaptations that are required after the first birth are on the whole greater than those that are associated with other births. She has to establish a new lifestyle, and culturally equate with her socially constructed gender role and identity. This can be affected by postpartum lifestyle changes and any psychological illness. Often she is compelled to perform the role of the 'good enough' mother, to the exclusion, and denial of her own needs [20]. She may normally cope with support from her partner, relatives, and health carers [25], if available.

Social support is protective, as it facilitates coping with crisis, and adaptation to change. Nonetheless, some mothers do not get sufficient help, and are unable to cope with the maternal role [27], thus ending up with stress-related illnesses [28]. Further postpartum aggravation of social problems could be caused particularly by financial pressures, when involuntarily unemployed [29], boredom if confined to the house, and adapting to time constraints that limit leisure activities and social networking. Relationship with her partner may become strained, more so, if the couple were not well adjusted prior to the pregnancy. Impaired social health could precipitate psychological ill-health, such as postpartum depression, and could also impede recovery from it.

Furthermore, the needs of the socially vulnerable mother have been recognised [30] with certain groups having particular needs for increased support in relation to childbearing. These groups include:

1. The very young, single, and unsupported mothers. Women who themselves have poor experiences of mothering may be especially vulnerable. Their own needs may conflict with those of their babies'. In women with such personalities, early planning to provide appropriate support is essential to help develop the woman's ability to care for her baby.
2. Older mothers who may have over-idealised expectations of pregnancy and delivery, and have problems adjusting to life-changes after the birth, need closer attention.
3. Women who have complicated pregnancies, including those with previous pregnancy loss, those who have undergone assisted conception, and those who required an emergency caesarean section, need tailored care.

These groups of women need patient-centred care to achieve the best obstetric outcomes.

Women also face an increased risk of mental illness and obstetric complications [31] if they experience domestic violence in the form of physical, emotional, or social abuse during pregnancy [32]. Around 30% of domestic violence begins during pregnancy with 40–60% women experiencing it in the puerperium. In violent relationships starting prior to pregnancy, women may be misled into thinking that pregnancy might prove protective. However, such abuse often escalates when the woman is pregnant. The reported prevalence can vary according to the method applied in identifying the abuse, and the characteristics of the sample studied. A study from

the UK reported that one in six pregnant women had experienced domestic violence [33]. It is recognised that those who experience domestic violence are more likely to carry a fetus of low birthweight, miscarry, undergo preterm labour or a stillbirth, and develop dysphoria along with psychosomatic problems [32]. Many (71%) women who experience antepartum domestic violence also experience exacerbation of the abuse postpartum, and there are links to behaviour problems (conduct, hyperactivity, and emotional) in their offspring [34]. Reluctance or evasiveness in disclosing that they are experiencing assault when questioned or the constant presence of a domineering partner, should raise suspicions [3]. Sociocultural constraints may prevent help-seeking or acceptance of available external support, particularly if economically vulnerable. Fear of reprisals from members of their family/community without any protection from those health carers gathering such personal information, may also restrict disclosure [35].

Epidemiology and risk of childbearing-related mental illness

Although during the antepartum period the onset of major psychiatric illnesses is infrequent, mild mental illness is not uncommon [9]. The range can vary from 6.6% to 14.1% [8]. Such disorders are more common during early pregnancy or nearer to delivery. Overall, major depression has a lifetime prevalence of between 5% and 8% in women, which is approximately twice that of men [9,36]. Pregnancy offers little protection against the continuation or development of mental illness, with major depression occurring both during pregnancy, and in the postpartum period [9]. Schizophrenia affects approximately 1% of the population [8,9]. Women with a past or family history of certain mental disorders are at increased risk of developing mental illness during childbearing. Recurrence in the postpartum period could be severe. Identifying this risk preconceptually or in early pregnancy allows for preventative interventions to be offered to the woman. Notwithstanding, many medications prescribed until the early second trimester need specialist attention as they may be teratogenic. In certain cases, when prescribing medication, balancing the risk to the fetus against the gain for the mother may raise great concerns, besides ethical implications. Hence, decisions have to be taken on a case-by-case basis. Suitable non-pharmacological intervention [37] has to be considered either on its own or jointly with any medication when planning a safe, effective, and culturally acceptable management protocol [38,39].

Anxiety and mood disorders

The remit of these disorders extends beyond the disciplines of psychology and psychiatry for they are not uncommon in women seeking advice from obstetricians and gynaecologists for physical complaints [40]. They might go unrecognised with serious sequelae unless identified by those familiar with a biopsychosocial evaluation of such manifestations. Among the anxiety disorders discussed here, tokophobia and post-traumatic stress disorder (PTSD) are underscored, while depression, including bipolar disorder, typifies the mood disorders.

Anxiety disorders

Anxiety is an abnormal mental state where the patient is aware of being nervous or frightened. It is often expressed with concurrent physical symptoms, such as breathlessness, dizziness, palpitations, tense muscles, perspiration, nausea, vomiting, diarrhoea, headaches, and tiredness, suggesting psychosomatic interactions. In fact, the patient may seek medical attention repeatedly for what would appear to be physical complaints, as anxiety can effect perception and thought processes. However, no organic cause for the complaints is evident. In these clinical scenarios, the

patient should be screened for anxiety disorders [41]. Anxiety disorders are common with 21% presenting during pregnancy [42]. They persist in 64% after childbirth. Other psychiatric disorders can be manifest with anxiety as a comorbid symptom. It is commonly expressed in 10–50% of those who are suffering from depression [43,44]. Forms of anxiety disorders present in pregnancy include generalised anxiety disorder, panic attacks, obsessive–compulsive disorder, tokophobia, and PTSD. The course of anxiety disorders in pregnancy is likely to be related to the severity of the illness preconceptually. The prevalence of generalised anxiety disorder and obsessive–compulsive disorder is higher in the postpartum period than in the general population and over 30% of pregnant women have subsyndromal symptoms of generalised anxiety disorder [43].

Panic attacks and obsessive–compulsive disorder can have enduring biopsychosocial effects on the mother and her infant. Physiological changes in respiratory function during pregnancy can predispose to an increased susceptibility to panic attacks. These can present suddenly as a sense of impending doom, and impair normal functioning. Panic attacks may worsen postpartum, and reportedly occur in 0.5–1.5% of mothers at six months' postpartum [45]. Anxiety, including its exacerbations as panic attacks, can be associated with concerns about the ongoing pregnancy, and its outcome. This can increase the intake of alcohol and substance misuse in those who have been habituated to do so, when facing worrying circumstances prior to pregnancy. Therefore, associated somatic complaints generated by such behaviour could surface. Anxiety may manifest as an obsessive–compulsive disorder, with obsession, compulsion, or both being present simultaneously. Childbearing increases the risk of such behaviour [41], particularly in those with a past history. Obsessive–compulsive disorder is thought to affect 2–4% of new mothers [46,47]. In these women, intrusive thoughts are followed by compulsive actions. Often these actions are performed as a ritual or are expressed as mental acts to overcome the intrusions. Such behaviour can cause considerable functional impairment. An acute onset can occur during the puerperium with symptoms escalating within a week, to result in significant maternal distress. Recurring thoughts occur, sometimes about harming the baby, along with repetitive actions to try and avoid these fearful intrusions, and consequently this behaviour contributes to her inability to function normally. Her anxiety can be exacerbated if misinterpreted by her contacts, including those health professionals who are unfamiliar with obsessive–compulsive disorders. She may have approached these health professionals for assistance. The disorder is under-recognised [48,49], despite considerable interference with the maternal role. As with other severe anxiety disorders, mother–infant interaction may be disturbed, with consequent neglect [50].

Tokophobia, from the Greek *tokos*, meaning birth and *phobos*, meaning fear, is an unreasonable fear of uterine contractions, and of the vaginal mode of delivery [51]. This relates to the woman's attitude towards childbearing, including false beliefs, generated by conversing with those who have had an unsatisfactory experience of delivery. This could, nevertheless, be aggravated by watching negative portrayals of childbirth [52]. In some individuals, the response to psychosexual adaptation during adolescence may be a contributory factor [53]. In those who were victims of sexual assault it may be initiated by the memory of such an assault. Primary tokophobia occurs in a nullipara who has a dread of childbirth. This often follows discussions with peers or after hearing from her mother of a negative childbirth experience. Conversely, secondary tokophobia reflects the woman's bad experience of a previous childbirth or the influence of other disappointing factors soon after an apparently satisfactory childbirth experience. Precipitating factors include an unwanted pregnancy or anxiety about fetal well-being [54]. A need for repeated reassurances from health professionals, along with multiple somatic symptoms induced by pregnancy-related fear that may include panic attacks, can result in an overuse of hospital services to seek reassurance. When pregnant again, an elective caesarean delivery may be requested [55,56]. Paradoxically, in one study, tokophobia occurred in those who had undergone counselling after a traumatic childbirth experience, including caesarean delivery [57]. Again, these women may demand an epidural analgesia at the onset of irregular uterine

contractions without signs of cervical change. They may not be willing to accept relevant advice when told that they are not in labour and that an epidural for pain relief is not indicated. Women whose fear of childbirth, following a traumatic birth experience, prevents them from getting pregnant again [20], could benefit from specific psychotherapy [58].

Post-traumatic stress disorder is said to occur when one responds to a traumatic event by expressing fear, helplessness, or horror [59,60]. It manifests as re-experiencing the event with numbing, nightmares, avoidance of reminders of the event, and hyper-arousal, which recur for at least a month [61]. Precipitating social factors include assault or being threatened with death or serious injury [62]. Women are twice as likely to develop this disorder as men [60]. The lifetime risk for women of childbearing age is reported as being from 10.4% to 13.8% [63], with a prevalence during pregnancy of 7.7% [64]. These may be underestimates, as there is a lack of recognition by health professionals, and many sufferers are unable to come forward to report it [63]. An ethnic/racial variation has been reported. The lifetime risk is increased in African-Americans and is lower in Asians, when compared with non-Latino whites [65]. Women may prefer to approach the primary care physician or the obstetrician, fearing stigmatisation if treated by a mental health team [66]. Post-traumatic stress disorder can have diverse presentations as varied obstetric or gynaecological symptoms, or could present with mood symptoms, including depression, thereby eluding diagnosis if one looks for a somatic illness only [62]. Associations with hyperemesis gravidarum; preterm contractions [59]; depression during pregnancy [67,68]; a traumatic antepartum procedure, where the patient felt a sense of powerlessness with an unsympathetic attitude of the examiner [69]; or an unhappy childbirth experience [70], such as ventouse-assisted delivery, have been reported. It is said to occur in 2% of women after caesarean delivery, particularly an emergency caesarean [20,71]. Domestic violence could also be associated with PTSD [72]. The sufferer may misuse drugs, especially nicotine and alcohol, with possible detrimental effects on the pregnancy. During labour the perception of pain is heightened and a pelvic examination may be declined while a caesarean delivery requested. Internet-based self-diagnosis using questionnaires could over-represent symptomatic women [73]. Moreover, if concerns are raised following such a self-diagnosis, an appropriate medical consultation should be mandatory to verify/exclude the presence of the condition. A satisfactory birth experience following a traumatic one is therapeutic—a 'redemptive' birth [74]. Table 4.1 depicts a clinical vignette illustrating this.

Vignette 1 presents an obstetric emergency—a terrified gravida demanding an urgent caesarean delivery to counter previous childbirth 'trauma' that was exacerbated by an internet-based self-diagnosis.

Table 4.1

	Clinical vignette 1: Acute exacerbation of a psychosomatic condition: a British Caucasian
Presentation and management	*Mrs RM, a 28-year-old para 1, married, school teacher, was a self-referral from home* ◆ She arrived dramatically on the labour ward at 3.00 a.m. accompanied by her husband; both in a state of panic ◆ She was almost incoherent while screaming that she was in severe pain, and that her planned caesarean scheduled for later that day should be carried out immediately ◆ A hospital midwife (MW) attended, and as the couple forgot to bring their hand-held notes, Mrs RM was questioned about her symptoms while the hospital notes were being accessed ◆ She was distressed, and appeared to be in established labour at term ◆ She seemed dazed, and unable to comprehend what was requested presumably because of the pain, and refused a physical examination or venous cannulation ◆ The obstetrician on-call was summoned to assess for a ruptured uterine scar ◆ Mrs RM kept on repeating that she had been traumatised

(*continued*)

Table 4.1 Continued

	Clinical vignette 1: Acute exacerbation of a psychosomatic condition: a British Caucasian
	◆ Her husband seconded her request for an urgent caesarean, as a caesarean had been planned because of her past 'trauma' ◆ The obstetrician persuaded Mrs RM to allow an examination in order to get the best outcome for her and her baby ◆ The general examination revealed a tachycardia of 104 but no other abnormalities ◆ The obstetric assessment confirmed a term pregnancy with a deeply engaged fetal head, and regular uterine contractions, a non-tender uterus, and a regularly beating fetal heart ◆ No abdominal scar was visible ◆ The presumption of a scar rupture was erroneous because of her dramatic entry without her hand-held/hospital notes, which had a duplicate of her pregnancy record ◆ Her cervix was fully dilated with the head 1 cm below the level of the ischial spines in a left occipito-anterior (LOA) position without caput or moulding—favourable for a normal delivery ◆ The obstetrician explained that she was not far from delivering vaginally, and that pushing back the baby into the uterus to carry out a caesarean would put both her, and the baby at a greater risk ◆ The couple agreed for a vaginal delivery and monitoring by an abdominal cardiotocograph (CTG) under a senior MW's care ◆ A live male baby weighing 3200 g was delivered normally after active pushing for 15 min ◆ Mrs RM and her husband were delighted at the outcome ◆ They were effusive and said that they had now got over the 'trauma' of the first birth
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ Mrs RM had a previous full-term ventouse-assisted delivery for failure-to-progress in the second stage, with maternal exhaustion—a clinically satisfactory materno-fetal outcome had been recorded in her medical notes ◆ The couple were very dissatisfied with their past experience, as they had wanted a normal vaginal delivery but their expectations remained unfulfilled ◆ After getting online information, Mrs RM concluded that she had been 'traumatised' by her previous delivery ◆ She sought support outside the usual healthcare pathway, as she felt that the health professional allocated for her postpartum care was only interested in her baby's welfare, and not in her health ◆ After her previous delivery she had experienced occasional nightmares, re-lived the experience of that birth and felt on-edge about it; symptoms suggestive of post-traumatic stress disorder ◆ Medical records of her past personal/social and family histories did not suggest an increased risk for psychosomatic ill-health but events that occurred later in life precipitated it; there was recovery after a satisfactory second birth experience
Impact on the healthcare system	◆ Her incoherence on arrival with a request for an urgent caesarean due to her great anxiety, misled health carers who inferred a uterine scar rupture ◆ Progression to psychosomatic illness due to trauma could have recurred with considerable personal, and healthcare costs if emergency caesarean was attempted when vaginal delivery was so close ◆ Mrs RM achieved a redemptive birth, although not by design ◆ She felt that she had been successful by delivering 'herself' at this second birth ◆ The couple reiterated that the previous trauma had vanished after this birth ◆ They were also pleased that the caesarean had been avoided ◆ This redemptive birth reduced the need for additional psychological intervention immediately after delivery ◆ Nonetheless, a careful watch was to be kept during routine postpartum checks for the recurrence of undue anxiety or mood symptoms

Table 4.1 Continued

	Clinical vignette 1: Acute exacerbation of a psychosomatic condition: a British Caucasian
Implication for training	◆ The MW's introduction and later discussions with the obstetrician indicated mutual respect and good team-working, which would have reassured Mrs RM ◆ After greeting the couple, the obstetrician got the right message across in between Mrs RM's screams and, despite the urgency, studiously avoided showing any distress. The obstetrician said, 'Mrs M (thereafter using her forename) … you must listen, please, for the sake of your baby, I cannot feel your pain but I do understand about your trauma and the post-traumatic stress, please let me examine you and listen to the baby's heart … I will inform you of my findings and we can discuss the birth plan; the anaesthetist and the paediatrician are waiting outside …'; Mrs RM decided that she could trust the obstetrician, and complied
What did this form of management prevent	◆ Additional treatment for potential post-traumatic stress disorder ◆ Tokophobia and/or depression in future pregnancies ◆ Requests for an elective caesarean delivery in a future pregnancy even if not indicated
Could anything further have been done?	◆ Repeat antepartum consultations with an obstetrician familiar with a psychosomatic management or a relevant multidisciplinary team ◆ Providing access to relaxation therapies could have helped her cope better in labour ◆ Once her fears were assuaged antenatally, informed decision-making about the delivery mode would have been easier.

Learning points Anxiety disorders can prevent lucid thinking. Information on the internet can be suggestive to the gullible, and increase anxiety in those who are vulnerable. Repeated consultations with a psychosomatic-oriented professional is indicated, to allay fears about the future mode of delivery or confirm a self-diagnosis made from web-based information. Repeat consultations with specialists familiar with a psychosomatic approach would be beneficial to those who feel traumatised after a bad experience of labour or have been suffering from resultant dysphoria [20,72]. Treatment with non-pharmacological methods and/or pharmacotherapy is indicated for those experiencing excessive anxiety. Anxiety disorders can also impair personal/social functioning with further impact on relationships, besides causing cardiovascular malfunction with clinical manifestations that may lead to hospital admissions and unnecessary investigations/treatment.

Non-pharmacological management Treatments for anxiety disorders [75] include behavioural and relaxation therapies, stress management, eye movement desensitisation and reprocessing (EMDR), and interpersonal or trauma-focused cognitive behaviour therapy (CBT) [76,77]. Interpersonal and family therapy can also help in avoiding and coping with aggravating factors, as can social network therapy. During labour, hypnosis may be helpful [78]. A caring attitude in the health provider improves the success rate of psychotherapy/counselling, but such expertise is not widely available. Standardisation of such therapy in various healthcare settings also needs to be addressed. Pharmacotherapy as an adjunct or alternative form of treatment is discussed at the end of this chapter.

Mood disorders

Mood disorders are related to a loss of the normal control of mood, thereby resulting in subjective distress. Depression presents as depressed mood and anhedonia or loss of interest and pleasure, and may be accompanied by a lack of energy or concentration (84%) and impaired thinking (67%), besides thoughts of self-harm or death. Certain types of personalities are more susceptible [79]. Patients presenting with unipolar I disorder have depressive episodes only. These are categorised as mild, moderate, or severe. Those with bipolar disorders have manic, mixed, or hypomanic episodes along with major depressive disorder. Major depressive disorder [80] is characterised

by depression lasting for ≥2 weeks with at least four symptoms from a list that includes: lack of energy, changes in appetite/weight, sleep and activity, feelings of guilt, difficulty in decision-making/thinking, and sometimes, suicidal thoughts. Patients could also present with elevated mood, euphoria, expansiveness, flight of ideas, insomnia, grandiose ideas, and heightened self-esteem instead of depressed mood. These symptoms may impair interpersonal, social, and occupational functioning. Mood disorders are among the commonest mental disorders experienced by women and can be associated with anxiety. Depression can present during the antepartum or postpartum periods, when emotional upheavals accompany corresponding hormonal changes. Studies have reported biological abnormalities associated with depression, such as low serotonin, norepinephrine, dopamine, histamine, and notably oxytocin [27], besides elevated HPA activity and thyroid dysfunction. These may be implicated in the pathophysiology, and the causative mechanism needs to be elucidated further. Other aetiological factors studied include lowered immunity, sleep disturbances, life events and genetic factors, all of which are increasingly gaining more attention [27,81]. Additionally, psychological symptoms, which include disturbances of mood along with anxiety and vegetative symptoms (related to energy, appetite/weight), are collectively referred to as 'dysphoria' [82]. They can present during pregnancy or postpartum as manifestations of depression, and remain as a silent morbidity if unidentified [20]. The economic costs of the morbidity due to non-recognition and under-treatment of depression [42,83] not only to the suffering individual [1–5] but also to her family, and to society at large, would defy accurate measurement. An antepartum prevalence of depression of up to 20%, and a similar postpartum prevalence at 3 months after delivery have been reported [40]. A past history of depressive illness is one of the strongest risk factors for antepartum depression, which in turn is predictive of postpartum depression.

Similarly, the aetiology of depression during pregnancy includes a family history of depression, stressful events, such as preterm birth and transfer of baby to a neonatal unit, a congenitally malformed fetus, poor marital relationships, generalised anxiety disorder, tokophobia, and association with the factor generated by multiplying vulnerability with life stresses [83–87]. Studies of childbearing-related depression in different populations also indicate that variations in cultural attitudes can introduce adverse aetiological factors along with specific presenting symptoms that are exclusive to the group being studied. Relevant aetiological factors for depression in a few small communities of Latin America, Africa, and Asia could be related to diverse factors that are not widely recognised. These may be predominantly related to violence, sociodemographic variables, socioeconomic deprivation, the practise of polygamy, and particular paediatric problems that are prevalent among these exclusive societies. In these groups, depressive symptoms can be presented in the guise of somatisation or expressed as neurasthenia [88,89]. Women migrating to Western countries from disparate populations could experience the additional stress of acculturation [89] that places them at a higher risk of dysphoria. Understanding ethnic differences in depressive symptomatology [90] may enable earlier detection and minimise communication difficulties, which reportedly lead to grievous harm in a few mothers [2–5]. Screening for the identification of childbearing-related depression should take the effects of acculturation into account [91]. Furthermore, because there are false-positives with every screening tool, a follow-up diagnostic interview is advisable for those ostensibly at higher risk.

Studies have used different screening tools for measuring childbearing-related depression, such as the Postpartum Depression Screening Scale (PDSS); Beck's Depression Inventory; the Hospital Anxiety and Depression Scale (HADS); and the Edinburgh Postnatal Depression Scale (EPDS), as no one screening measure fulfils the criteria for universal [88] application. The EPDS was designed as a self-reported postpartum screening measure for depression to be used in samples presenting in primary care [92,93]. The sensitivity of 86% and specificity of 78% was relevant for the initial

sample studied using a cut-off score of 12/13. Its limitations include false-negatives [94] due to deliberate incorrect marking by those being screened in order to avoid getting higher scores, and thereby being categorised as diseased. Cultural variations in self-reporting and inadequate responses or disagreement with the results have also been reported [94,95]. Thus, more caution is needed in applying it to screen diverse samples. Treatment offered based on such screening has also been declined by some women [96]. In certain cultures, being sad is accepted as a normal phenomenon with no treatment being indicated [88]. A lower predictive value of the EPDS when compared with health visitors' reports has been observed [97]; furthermore, if the severity of a depressed mood can be considered as a continuum, with different levels, it could be better represented by dysphoria [98]. The National Institute for Health and Care Excellence (NICE) did not recommend the EPDS as a stand-alone screening tool [49]. Evaluating dysphoria as an alternative measuring tool for childbearing-related depression was suggested [99], and this was used in a 2009 research setting [100]. If inadequately treated, maternal depression can cause both short- and long-term maternal morbidity, in addition to adversely affecting the child [6,101,102], and the partner [103].

Studies suggest that 4–6% of women on antidepressant treatment at the time of conception are likely to discontinue treatment, without consultation, on discovering that they are pregnant [104]. This can place them at greater risk of relapse of the illness [105]. Where patient attitudes hamper open communication [106], a psychosomatic approach would facilitate discussion, and improve compliance [107], which should lead to improved outcomes. Since obstetricians and gynaecologists can encounter depressed women, being trained in its detection and treatment would seem desirable [81]. However, the logistics of imparting such training, particularly in resource-poor settings, expressly where there are competing interests, needs to be demystified. Besides, over- or under-diagnosis without the means for appropriate management when the diagnosis is confirmed could cause considerable harm, so would be ethically unsound.

Management of mood disorders includes both non-pharmacological and pharmacological options. The pregnant woman who is diagnosed as depressed may prefer no treatment (watchful waiting). She may accept management without medication, which would include her choice [20] from a selection, even though the evidence is sparse for some of these treatment options. These methods incorporate intensive professional postpartum support, non-directive counselling, CBT, interpersonal, or family therapy [108], bright light therapy, omega-3 fatty acid dietary therapy, exercise, acupuncture, massage, and electroconvulsive therapy. In select cases, these therapies can be used alongside treatment with drugs. Non-pharmacological treatments are however subject to availability, even in well-resourced countries [109], with a deficit of suitable psychotherapists/counsellors, globally. Pharmacotherapy (discussed later) has a role in treating moderate to severe depression [110]. Again, the mother who is breast-feeding may not want to expose her infant to antidepressants. Caution is particularly required for mothers with infants who are sick, premature, or of low birthweight. Specialist medical advice would be needed in such situations, especially if the mother's choice of non-pharmacological management is unavailable in her area of residence.

Bipolar disorder (previously known as 'manic depressive disorder'), affects around 1% of women during their reproductive years, with both men and women being affected equally. Both genetic and environmental factors, including life's stresses influence the individual's susceptibility to bipolar disorder. Recurrence during pregnancy or the postpartum period can occur with severe manifestations usually presenting in the early postpartum period. Mood alterations can vacillate between depression and elation with depressive or dysphoric-mixed episodes being more prevalent during pregnancy than in the non-pregnant women. There can be an associated psychosis. Women with bipolar disorder prior to pregnancy are likely to be on maintenance therapy and

there are teratogenic risks associated with most mood stabilisers. Pre-existing bipolar disorder is one of the greatest risk factors for puerperal psychosis. Puerperal psychosis occurs in 0.2% of women and sufferers are at a 50% increased risk of severe mental illness in later life, including antepartum psychosis in a future pregnancy [111]. Viguera and colleagues [112] found that almost 60% of bipolar women who discontinued prophylactic lithium treatment at the onset of pregnancy relapsed at some point during their pregnancy. The relapse rate was almost identical to that among non-pregnant women who discontinue prophylaxis.

Lithium has been a useful drug for the management of bipolar disorder. It is not recommended from the periconceptual phase to the early second trimester, because of its teratogenicity [110]. However, if the woman is already taking the drug, there may be a risk of relapse on discontinuation. The risk is greater when the drug is discontinued suddenly rather than when the medication is taken off gradually. If after balancing the risk against the benefit it is decided to continue with the medication, the lowest possible effective dose should be given with informed consent. Furthermore, the lithium concentration should be monitored during the pregnancy. Similarly, lithium toxicity can occur during labour and this can be prevented by keeping the patient well-hydrated. It has been estimated that over 60% of women with bipolar disorder will experience relapse in the first six months postpartum if not taking mood stabilising agents [112]. Irrespective of decisions about medication during pregnancy, all women should be offered prophylactic medication (usually lithium) immediately following delivery.

During an emergent crisis, help through the General Practitioner (GP), and where available, through the regional perinatal services, should be undertaken. If the emergency manifests postpartum, admission to the mother/baby unit in a psychiatric hospital is advisable. Recent data indicate that the distribution of mother/baby units even in high resource countries is variable (see http://maternalmentalhealthalliance.org; UK map). Therefore, this form of transfer has aroused controversy, as such units are not available in every geographical area. Further, evidence is also needed to advocate such transition globally, as it is unclear whether this type of joint care is more cost-effective than separate care [113]. It is important to remember that, unlike with schizophrenia, there is little evidence that bipolar women are any less able to care appropriately for their children, except during the acute phase of their illness. Hence, the baby could be handed back to the mother when the risk of acute episodes leading to self- or infant-harm are no longer a matter of concern.

Decisions regarding continuation, stopping, or change of treatment, for part or all of the pregnancy, should be made on an individual basis, and with the woman's fully informed involvement. This should be done as part of pregnancy planning. Factors to be taken into account include the previous natural history of the disorder, which includes the number, severity, and time interval between episodes of illness, as well as the response to previous treatment discontinuations. Currently, there is an ongoing world study investigating the causation of bipolar disorder in relation to genetic and environmental associations of sufferers [114]. The results of the study when in the public domain will advance our understanding of the disorder.

Schizophrenia spectrum disorders

Schizophrenia relates to a spectrum of disabling mental disorders that affects thought, emotion, perception, and aspects of behaviour. It has a life-time risk approaching 1%, and is usually long-lasting, with commencement before 25 years of age. It affects both sexes and all ethnic groups equally. It can present as positive symptoms of: hallucinations, delusions, thought disorders, motionless or agitated posturing. Negative symptoms, such as talking little or in a dull voice can also manifest. Difficulty in displaying emotional expressions or in the planning, and execution of daily tasks, may occur. Among the aetiological factors implicated are genetic, neuropathological,

psychoneuroimmunological/endocrinological, biochemical, and psychosocial, along with disconcerting family dynamics. The hypothesis that schizophrenia is related to an increase of dopamine in the neurological circuits of the brain is partly supported by the premise that antipsychotic medication, which reduces the effects of increased dopamine, can improve outcomes. There is good evidence to suggest that the fertility of women with enduring severe mental illnesses, as when having schizophrenia, is now similar to that of the general population [115]. This is due to the availability of comparatively more effective new medications than those that were prescribed previously. This has allowed the prescribing of new antipsychotic medications, which have a much lower propensity to raise prolactin levels and suppress ovulation. All women who switch from older drugs to these new psychotropic medication may not be aware of this, and may place themselves inadvertently at risk of an unplanned pregnancy by not taking appropriate contraceptive measures. Lack of planning is nevertheless, undesirable, as the illness can be exacerbated in a subset of women during pregnancy, and also postpartum.

Preconceptually, women with schizophrenia are more likely to suffer from overweight/obesity, diabetes, chronic hypertension, dyslipidaemia, and thromboembolic disease, than those without the disorder. A population-based study [116] has reported that pregnant women with schizophrenia are at increased risk of preterm birth with small- or large-for-date fetuses, placental abruption, hypertension, caesarean delivery, and septic shock. Admission of their baby to the Neonatal Intensive Care Unit along with re-admissions after being discharged, can result in a higher neonatal morbidity. The interventions and suboptimal materno–fetal outcomes would add to the risks of biopsychosocial morbidity from associated complications of the management provided at childbirth. These may include caesarean wound problems with recurrent febrile episodes that sometimes need re-admissions after the mother with baby have been discharged or hospitalisation due to the mother's presentation with dysphoria or PTSD after an unsatisfactory birth experience [20]. In addition, the potentially destabilising effects of the pregnancy on her positive/negative symptoms could increase the mother's risk of mortality at one year postpartum [116]. Women with schizophrenia are also likely to be unmarried with less social support. Although not always adverse, the outcome of any deliberations regarding the mother being the primary care-giver for her child, is often unfavourable [117] for the mother. This could cause great maternal distress, and may increase concerns in her health carers. Better outcomes are seen for women with supportive social networks and absence of mental illness in the partner. Appropriate support, including engaging with social services when pregnancy is confirmed, in order to ensure that sufficient help is available to the mother, is obligatory. It is often difficult for women with schizophrenia to cope with frequent contact with health professionals during pregnancy. Thus, there is a risk that they may receive suboptimal antenatal care. Prior planning with an empathetic psychosomatic approach can help reduce the risk of non-compliance, and aid in delivering patient-centred care.

Various aspects of the disease remain unclear but there are guidelines [118] to address care of women with schizophrenia preconceptually, during pregnancy, and postpartum. New research is emerging to facilitate better understanding of the aetiology, and this could be translated into improving clinical care. Two recent studies [119,120] report management successes using solely non-pharmacological methods or by taking medication, only. Most women choosing antipsychotic medication will be on maintenance therapy when deciding to get pregnant. The implications of relapse during pregnancy are severe for both mother and child. It has been advised that unless there are strong reasons to the contrary, treatment should continue, with appropriate monitoring, throughout pregnancy. However, there is controversy regarding the metabolic effect of drugs on the mother, and about any fetal/neonatal adverse effects. Difficult decisions may have to be made regarding the relative advantages and disadvantages associated with continuing a well-established regimen involving newer antipsychotics or switching to older medication, where the

risks associated with pregnancy are better known. Fostering/adoption of the newborn is another issue for deliberation where the risk stemming from the mother's illness could lead her to harming herself and/or her baby.

Substance misuse and psychosomatic maternal/infant effects

Substance misuse is a common problem worldwide [121], affecting over 50% of women aged 18–35 years [122]. There has been increasing concern at the rise in drug and alcohol use among women of childbearing age with some having started when in high school. In particular, there has been a sharp increase in the number of young women drinking at harmful or hazardous levels, which includes binge-drinking. As substance misuse can be associated with anxiety and mood disorders [81], these conditions can reinforce dependent or addictive behaviour. Evidence from the Confidential Enquiries [1–3] suggests that substance misuse makes a significant contribution to maternal mortality among both the general and the psychiatric patients. Characteristically, these women are late bookers or non-attenders at pregnancy clinics. Their impaired physical health may relate to the effects of exposure to human immunodeficiency virus (HIV) and hepatitis, which was acquired from infected blood or semen. This places them, and their pregnancies, at a high risk of future adverse effects if transmitted to the infant. They may be immunocompromised due to low CD4+ cells so are also at increased risks of other infections, and prone to cancer. Many of these women smoke tobacco or misuse illicit drugs concomitantly. They may also suffer from other less common mental illnesses, such as personality disorders, schizophrenia, and post-traumatic stress, along with disrupted social support systems [122]. Thus, the resulting short and long-term biopsychosocial sequelae of substance misuse would seem inevitable for individuals living in such appalling circumstances that consequently jeopardise pregnancy care.

Alcohol use tends to decrease during the antepartum period. Continuing misuse may give rise to a number of physical complications, which may in turn threaten or complicate pregnancy. These include maternal nutritional deficiencies, besides cardiovascular, liver, and pancreatic disease. Withdrawal complications such as delirium tremens and seizures may also have adverse consequences on the pregnancy. Excessive alcohol use is associated with greatly disturbed organogenesis in early pregnancy. This can be attributed to the inherent properties of the alcohol molecule, which can pass the placenta almost instantaneously with all cells being able to take it up, including several neurotransmitters. In comparison, the cocaine molecule is only taken up by one neurotransmitter. Other teratogenic effects include abnormalities of the cardiac and urogenital systems, as well as eye, ear, and limb anomalies. 'Fetal Alcohol Spectrum Disorder' is a term used to encompass the range of teratogenic and neurobehavioural effects of alcohol on the fetus, and the developing child [123]. These include the original triad of growth retardation, facial dysmorphia, and central nervous system dysfunction, described as Fetal Alcohol Syndrome [124] and additional features, which can manifest, include dental problems, cognitive and behavioural dysfunction, mild learning disabilities, and severe attention and memory deficits. These adverse outcomes have a debilitating effect on the mother and child, with additional support needed for both to prevent biopsychosocial morbidity. Advice given from the World Health Organization (WHO) is that women should not consume alcohol during pregnancy. Other national/international guidelines support this, with most countries also recommending the avoidance of alcohol when breast-feeding, or preconceptually.

Effects of drugs misused vary depending on the properties of the specific drug. Furthermore, polysubstance misuse is most common [125], and research on subsequent effects is limited. Unsatisfactory pregnancy outcomes of women who misuse illicit drugs usually compromise their physical, mental, and social well-being. It can alter their behaviour further with far reaching

consequences on their family/friends, and their communities. Substance misuse also has a considerable impact on the systems involved in trying to promote the addict's overall health. Women who smoke tobacco during pregnancy are at increased risk of placental abruption, placenta praevia, and premature rupture of membranes, as well as the possibility of intrauterine growth restricted, premature, or stillborn babies. Additionally, the progeny of smokers may manifest attention-deficit or other conduct disorders during childhood, and are at increased risk of sudden infant death syndrome. Smoking marijuana during pregnancy has similar effects on the fetus as tobacco smoking. There is a possible link between exposure to benzodiazepines in early pregnancy and oral cleft anomalies. However, research is conflicting with differing results from case-controlled and cohort data [126].

Cocaine use during pregnancy [127] is associated with an increased risk of miscarriage, premature labour, hyperthermia, cardiovascular effects, and placental abruption, along with fetal growth restriction, and reduced fetal head circumference. Its use in the third trimester can cause abstinence symptoms in the neonate. Use of cocaine in pregnancy also increases the risk of associated renal, genital, cardiac, and brain defects in the fetus, learning difficulties in childhood, and cardiac disease in adulthood. Naltrexone has been used as a substitute for cocaine withdrawal in the second trimester with satisfactory outcomes but if used during the first and third trimesters, miscarriage or preterm labour can ensue. Opiate use is associated with neonatal abstinence syndrome, and a risk of unintentional overdose postpartum, when women may return to uncontrolled use. Heroin addiction is associated with premature birth, low birthweight, as well as neonatal breathing difficulties, hypoglycaemia, and intracranial haemorrhage. Additionally, there is a high risk of abstinence symptoms in the neonate, and sudden infant death syndrome [128]. There is also an increased risk of acquiring HIV if the mother has been infected when using unsterile hypodermic needles. Abstinence or substitution of the addictive drug with methadone remains controversial, as larger doses of methadone can cause a more severe form of neonatal abstinence syndrome, than if other opiates are used [129]. Persisting adverse psychosocial circumstances can promote conditions that encourage drug dependence, as well as addiction outwith pregnancy. During pregnancy, the situation can be further aggravated by the additional commitments of the maternal role, especially if without a caring partner or social support. Such morbidity would be of a greater scale in nuclear families. This could engender psychosomatic disease in these women (see Chapters 8, 12).

Pregnant women who misuse drugs should be cared for jointly with specialist addiction services [1,2] that can assist in modifying their behaviour and thus reducing its potential psychosomatic repercussions. Motivation to change is often increased during pregnancy, which combined with increased health professional contact, may instigate a significant behavioural change at this crucial time. Early, proactive involvement of social work services is essential. Abrupt discontinuation of drug use is not recommended. There is evidence for overall advantage to the fetus of methadone substitution, despite the potential for a more prolonged abstinence state [129]. Continued use of heroin suggests a bad prognosis for the mother and child. For women addicted to opiates, stability in the first and third trimesters is usually desirable, with any attempts at reduction of intake confined to the second trimester. Any decisions finalised must take into account the woman's wishes, and the risks of return to uncontrolled/illicit use. Illicit substance misuse, during pregnancy and after, can have both short- and long-term deleterious effects on the offspring. Such effects are not only restricted to childhood but continue into teenage years, and through adulthood [130]. Concerns are raised about the pregnant woman, who continues with substance misuse, occasionally with her partner's collusion or coercion. Addiction to drugs may be maintained by a violent partner, thereby raising pertinent concerns about State protection, and foster care for the baby. In certain personal/social situations, fostering has to over-ride uncertain mother–infant bonding,

and unreliable baby-care when kept with the biological mother. This is considered to be in the best interests of the infant. However, all decisions about fostering should be taken by multidisciplinary teams with the mother's input, if she is mentally competent, despite any comorbid mental illness. The evaluation would also have to consider that removing the baby for fostering may worsen maternal mental illness and encourage further substance misuse. Table 4.2 presents a labouring schizophrenic who misused drugs.

Vignette 2 depicts an acute-on-chronic onset of a psychosomatic manifestation in a labouring woman.

Table 4.2

	Vignette 2: Presenting on a bank-holiday weekend with a police guard, screaming profanities: a British Caucasian
Presentation and management	*Ms AB, a 40-year-old para 1, single, unemployed, heavy smoker, who had misused drugs and alcohol intermittently, presented for urgent hospital care* ◆ She arrived at the hospital via ambulance in the early evening ◆ She entered the labour ward accompanied by a community MW; a mental health nurse; a social worker and a police escort also accompanied her but left after she was admitted ◆ She was a tall figure (5ft 9in), screaming profanities ◆ As she appeared to be in established labour at term, an experienced hospital MW took up her care and asked her to stop 'lashing out' ◆ She had a previous full-term spontaneous vaginal delivery at 21 years of age ◆ She had booked for this pregnancy at 22 weeks when a detailed ultrasound (U/SS) confirmed an active singleton with no evident congenital anomalies ◆ She refused to attend the hospital for antenatal care and was a very poor attender at her MW's clinic ◆ Ms AB was considered to be at high risk with a Hepatitis B (not active) and Hepatitis C seropositivity but had a negative HIV antibody test ◆ She was a paranoid schizophrenic with a personality disorder and had been on regular antipsychotic depot injections, and then on an oral maintenance dose over a five-year period; she missed taking her tablets, fell pregnant, and then came off them ◆ She could be violent and uncooperative with health carers ◆ On the day she presented, she was having frequent uterine contractions but refused an examination by the MW, and declined the inhalation analgesia offered for her pain ◆ She demanded that the MW get a doctor to carry out her caesarean delivery urgently as she could not bear the pain ◆ The MW felt that she was having bearing down pains, and asked her to commence pushing but Ms AB would not cooperate ◆ She insisted that the doctor attend and carry out a caesarean ◆ The obstetrician on-call was urgently summoned and briefed about Ms AB, who the MW felt was in the second stage, and was holding back from pushing as she wanted a caesarean delivery ◆ The obstetrician's impression was that Ms AB was greatly agitated and frightened ◆ Her request for a caesarean was repeated but she consented for an examination to plan her delivery, and obtain appropriate analgesia ◆ Her general observations were stable other than a tachycardia of 96; she had a non-tender abdomen with a longitudinal lie, cephalic presentation, and was having strong uterine contractions; the fetal heart rate was within the normal range

Table 4.2 Continued

	Vignette 2: Presenting on a bank-holiday weekend with a police guard, screaming profanities: a British Caucasian
	◆ Her cervix was fully dilated with the head just below the ischial spines, in an occipito-anterior (OA) position, and clear liquor was draining ◆ The findings were explained to her and the need to continue with a vaginal delivery along with advice about the type of analgesia suitable for the imminent vaginal delivery ◆ She accepted to undergo a vaginal delivery somewhat reluctantly but insisted that she be given epidural analgesia, although when vaginal delivery was imminent, this was not part of the hospital's protocol ◆ After a hasty discussion, the anaesthetist agreed to placate her by starting preparations to site an epidural ◆ Despite having good contractions she seemed to resist pushing actively but the attending health professionals kept on encouraging her ◆ Suddenly she could not hold back any longer and decided to push actively ◆ The MW applied perineal support and she delivered a live, male baby who cried immediately; the placenta with membranes were delivered next ◆ Her perineum was intact despite the somewhat precipitate delivery ◆ The anaesthetist abandoned her scrubbing for siting an epidural ◆ The paediatrician was summoned in but when he entered, Ms AB shouted, 'I do not want a man in this room' ◆ It was explained that he was the 'baby-doctor', and she accepted his assessment of her baby ◆ The only occasion when she smiled was when the paediatrician informed her that the baby was fine ◆ The baby weighed 2580 g; Ms AB did not want him out of her sight and held him ◆ She then wanted to smoke and had to be taken to the area designated for this; the rest of the hospital was a smoke-free zone ◆ She stopped taking antipsychotic drugs when pregnant and later gained official permission for this from her psychiatrist, and her obstetrician; she refused psychotherapy as an alternative for the medication when pregnant ◆ Following her delivery, after a psychiatric consultation, she was given antipsychotic medication as a depot injection ◆ She was discharged early with psychiatric advice and a follow-up plan ◆ The baby was taken for State Protection as decided during Ms AB's pregnancy, and would be bottle-fed
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ Ms AB had experienced complex personal trauma in childhood, became a truant and did not manage to complete her schooling ◆ She was a troubled teenager, and was traumatised in a relationship, lacked parental support, turned into an alcoholic, misused drugs, and ran away from home ◆ Family history records suggested a vitriolic relationship with her parents ◆ She was convicted of violent assault, assessed by the mental health team who confirmed schizophrenia, and started treatment ◆ She first conceived at 21 years of age but the partner's name was not revealed; the baby had protection as advised by the State tribunal ◆ Her behaviour appeared to get more unpredictable with uncontrollable violence, and another assessment revealed that she had a personality disorder along with the schizophrenia (traumatic) ◆ Details of who fathered this pregnancy were not known ◆ She had been on remission when she got pregnant ◆ She was considered as unreliable so a State Protection order was issued for her newborn's safety

(*continued*)

Table 4.2 Continued

	Vignette 2: Presenting on a bank-holiday weekend with a police guard, screaming profanities: a British Caucasian
	◆ She knew that the baby would be taken away at birth and that terrified her; she had got used to the pregnancy, and was attached to the baby ◆ As labour progressed she perceived that her physical pain was getting unbearable, and with the onset of a painful second stage she demanded a caesarean on reaching the hospital ◆ Unknown to her social worker and health carers she had planned to have a home delivery, and hide her baby, so Ms AB was very disappointed that this did not happen when the 'voices' told her it would ◆ Her previous trauma may have surfaced in labour; her perceived pain intensified as she laboured alone at home, and feared harming her baby
Impact on the healthcare system and probable explanation for her behaviour in labour	◆ A slightly late booking limited antepartum screening or early identification of health risks, and preconceptual planning was not possible ◆ Yet, she was at high risk because of her mental illness along with the history of substance misuse ◆ Her behaviour in labour suggested intense fear, which could have added instability to the already existing health condition ◆ She did not call her MW when in labour, contrary to advice as she wanted to keep her baby and tolerated the initial pain hoping that she could deliver secretly at home as the 'voices' had told her ◆ In the end, the unbearable pain and the fear of harming her baby made her call the community MW who then called her social worker, and a police escort; Ms AB could be violent if distressed ◆ This made her very angry and she became abusive and uncooperative until she felt reassured that the hospital staff were heeding her wishes; she then started trusting them ◆ Even though the obstetric outcome was satisfactory, her health condition necessitated additional support with incurring costs; caring for her baby who had Sate Protection would also incur costs
Implication for training	◆ The MW's introduction indicated her confidence in the obstetrician's skills, and all team members communicated well under unusual circumstances ◆ The obstetrician got the message across in a calm voice and manner without appearing paternalistic, 'Miss B (then her forename) …, I understand that you are in great pain and want a caesarean delivery but unless you let me examine you, I cannot decide about the best option for your delivery … please let me assess to give you the right treatment for your pain … I know that you want this baby out soon and you want to hold your baby … I want to help you and want you to be in control of your delivery … I will examine and listen to the baby's heart and let you know my findings … we can then plan the delivery …'; fortunately Ms AB felt that the doctor was empathic, and she complied
Was this form of management appropriate and what did it prevent?	◆ The management including hearing the fetal heart seemed to pacify Ms AB ◆ Further distress and non-compliance was overcome by using the psychosomatic approach, which emphasises the expression of compassion and empathy; one can thus work with a woman who is frightened and has lost trust in health personnel who seem hostile to her, and authoritarian ◆ Ms AB's aversion to vaginal assessments may have been present in the second stage, along with her worry/fear that the baby will be taken away at birth ◆ Counselling during pregnancy may have helped as she had come off antipsychotic medication after missing her period but she declined it ◆ On arrival to the labour ward she was persuaded to trust and accept hospital care ◆ This prevented an unsatisfactory obstetric outcome

Table 4.2 Continued

	Vignette 2: Presenting on a bank-holiday weekend with a police guard, screaming profanities: a British Caucasian
Could anything further have been done	◆ An earlier detection of Ms AB's anger and loss of trust in her MW and her social worker, as they could not promise her visiting rights/custody of the baby, may have expedited the involvement of other healthcare professionals; this could have averted the distress caused by her ill-judged decision for a home delivery, and keeping her baby with her. The ensuing uncooperative behaviour with the MW, and mental health nurse could perhaps, been avoided.

Learning points

Health carers have to allow for behavioural changes, and be vigilant about the effects of coming off anti-psychotic treatment when pregnant patients with schizophrenia attend. Ms AB had come off anti-psychotic medication when pregnant after discussion with her psychiatrist but symptoms of schizophrenia seemed to have returned as she was nearing her expected date of delivery. A care pathway and appropriate referrals with more intensive monitoring can be built into the pregnancy plans of such women, though they may be less compliant when situations change, as is possible with any pregnancy or labour. Notwithstanding, the patient's wishes have to be respected as with Ms AB. Obstetricians should approach agitated patients who have difficulty in complying with health advice in a polite, non-judgemental manner, and use judicious language. The patient who feels that the attending doctor is not being paternalistic, and is genuinely interested in her welfare, usually complies. Help should be available to protect health professionals if the patient shows uncontrolled rage, and veers towards violence during a consultation. Ms AB seemed to be satisfied with her pregnancy outcome. She was docile after her successful vaginal delivery, which raised the ethical issue of whether the denial of her request to keep her baby was appropriate. If she maintained good behaviour, a re-think regarding her request to be the primary carer of her baby, was a possibility.

Non-pharmacological management

Schizophrenia can be managed by CBT, including family therapy, and cognitive rehabilitation using Cognitive Adaptation Therapy (CAT) and Cognitive Remediation [131]. After the first episode of psychosis, early management with CBT would lead to early recovery and prevent relapse. Non-pharmacological management is usually integrated with pharmacotherapy. It provides symptomatic improvement principally with negative symptoms not responding to medication, and reduces the onset of new episodes. Patients can be non-compliant because of the side-effects of medications. Non-pharmacological management could help promote compliance. There is limited evidence that in non-compliant patients a solely individualised CBT can provide symptomatic improvement [120]. Art therapy has been used but needs further evaluation. Comorbid conditions, such as drug misuse, have to be dealt with concurrently. These could include methadone substitution for opiates, or behaviour therapy and nicotine replacement therapy for smoking tobacco. Pharmacotherapy for schizophrenia or for concomitant depression is discussed later in this chapter.

Personality disorders and conversion disorder

The recognition of personality disorders is steeped in controversy. Those who question their existence believe that those who have been given such a diagnosis have in their behaviour

usually responded to a traumatic childhood commonly associated with sexual abuse, neglect, and poverty. Categorising their response to such trauma into a psychiatric disease defeats the purpose of understanding, and supporting these individuals whose mental condition with a wide range of feelings/experiences cannot be classified into a disease by any examination and/or investigation. When categorised into a psychiatric disease, sufferers could also face stigma and exclusion if the information was leaked to their social circle. Nonetheless, personality disorders have been included in the APA's Diagnostic and Statistical Manuals, including DSM-5 [132]. These disorders [133] are said to be deeply ingrained and enduring patterns of behaviour. Hence, they result in inflexible responses to a broad range of personal, and social situations. The patterns of behaviour are stable and unchanging, and are usually present from adolescence. Often, the rigidity thus imposed causes the person or those around them, to suffer [134]. There are often difficulties in forming and sustaining relationships. This may extend to their links with the health professionals involved in their care. In one epidemiological study, the prevalence of personality disorder in pregnancy was 6.4% [134]. Of the group of personality disorders, the emotionally unstable type is perhaps the most commonly diagnosed disorder in young women. It is characterised by emotional instability, impulsivity, dysphoric mood, disturbances of self-image, chronic feelings of emptiness, and self-destructive behaviour. This can include recurrent self-harm and drug or alcohol misuse. Such difficulties may be worrying to health professionals, as they could interfere with effective antenatal care. Impaired forward planning, and intolerance of any distress, may increase anxieties regarding fetal well-being. Effective management is usually provided through good team-working, and communication between professionals. A clear and consistent treatment plan, along with scope for modifications, if necessary, should be discussed with the patient and her usual carers. There may be a role for specific psychological, and drug therapies.

Conversion disorder [135] is diagnosed when there are deficits of voluntary motor or sensory function, which suggest a neurological or general medical condition. However, a detailed neurological examination, including assessment of the mental status, appropriate investigations, and imaging studies, do not confirm a neurological cause. Conversion symptoms are not under voluntary control and thus are unlike malingering or a factitious disorder. They are presumed to result from stress or a psychological conflict, which may not be initially apparent. A good psychosocial history may reveal this with recent stressful life events adding to early trauma in a multifactorial stress model of causation [136]. More females are affected than males. Patients with these disorders are able to avoid unpleasant situations at home or at work. They attract attention or gain support from others, due to their disorder. Hence, they may obtain a desired primary or secondary gain. Symptoms of paresis, paralysis, tremors, sensory disturbances, and visual symptoms are presented but they are self-limited. During physical examination, a weakness of the limbs may be displayed, which can suddenly give way. There may be hemisensory loss stopping in the midline or sensory loss over discrete patches. Visual symptoms may be complained of but with normal examination findings, including ocular reflexes. Many have spontaneous remission of symptoms. Comorbid anxiety, mood symptoms, or schizophrenia may occur. Follow-up with a neurologist or a psychiatrist is recommended. Treatment may be needed for co-existing health conditions.

A vignette depicted in Table 4.3 is a clinical psychosomatic challenge that presents repeatedly as obstetric emergencies in the third trimester.

Table 4.3

	Vignette 3: Acute exacerbation of psychosomatic problem antenatally: a British Asian
Presentation and management	*Mrs AI, a 21-year-old primigravid, married housewife, at 35 weeks' gestation* ◆ She arrived via ambulance to the antenatal ward at 3.40 a.m. accompanied by her husband and sister-in-law who were in extreme distress ◆ She was in a wheelchair and had to be lifted on to her bed as she could not stand on her legs or support herself with her right arm, for the right half of her body was paralysed ◆ This was a much wanted first pregnancy, and her early booking ultrasound scan confirmed a singleton ◆ On serial measurements the baby appeared constitutionally small for dates but the trend in the growth was maintained just below the 50th centile ◆ She had been a low-risk pregnancy and other than mild anaemia, which had been corrected by oral iron, she did not need any treatment ◆ The hospital MW admitted her, and urgently paged the obstetrician as Mrs AI had a severe headache, and was unable to move her right upper and lower limbs ◆ At home she had complained of a headache since the previous afternoon, was nauseous, felt feverish, took oral analgesia, and went to bed early but had spilled her bed-time drink when trying to reach it; she slept for a while, and then woke up to go to the bathroom but was unable to move her right limbs ◆ At admission, she responded slowly but appropriately to questioning ◆ She looked haggard but her general observations were within the normal range other than a temperature of 37.2°C, and slight breathlessness ◆ She was obstetrically stable and the brief neurological examination showed that she was mentally clear, there was no neck stiffness or tenderness of the spine, examination of the cranial nerves and special senses were normal; the left side of the body showed normal sensation and tone with normal deep reflexes; the right half of the trunk showed normal sensation to both sharp and blunt touch; there was hyperalgesia over the right upper and lower limbs and no voluntary movement was possible; when bent passively the right elbow and right knee joints were initially stiff but the resistance suddenly gave way, akin to the 'cog-wheel' rigidity of Parkinson's disease, though there was no intention tremor; eliciting right limb reflexes was difficult because of their stiffness—a peculiar examination result which did not fit the pattern of a typical clinical condition ◆ An urgent neurological opinion was sought and the on-call medical registrar obliged; the examination findings were similar to that at admission; further non-invasive investigations including imaging studies were advised ◆ A provisional diagnosis of pregnancy with right hemiparesis and simulated cog-wheel rigidity was made; with no cause evident symptomatic care along with antithrombotic measures were advised ◆ That night, Mrs AI dozed intermittently and was sick twice; she could not keep in her breakfast the next day but after receiving antiemetic medication, kept in fluids, and then her dinner ◆ A neurologist's opinion was obtained but no new findings emerged, and symptomatic treatment was advised ◆ A provisional diagnosis of a psychological disorder, such as a conversion disorder or hysteria, was made ◆ Regular passive exercises of the right limbs was carried out, and after two days, a flicker of voluntary movement of the right hand was noted; a daily increase in the range of movement continued so that by seven days, she was able to stand up and take a few steps with support while her hand grip got stronger ◆ By the tenth day she was walking without support

(*continued*)

Table 4.3 Continued

	Vignette 3: Acute exacerbation of psychosomatic problem antenatally: a British Asian
	◆ She was extremely anxious about her pregnancy and many of her family, and extended family members, visited daily ◆ No biological cause had been detected for her symptoms ◆ Obstetrically she continued to progress satisfactorily, and expressed a desire to go home to her family ◆ Mrs Al was discharged after a fortnight; she was transferred to consultant care for her clinic appointments to reflect her risk status, which had moved from low to high risk ◆ Five days after discharge she returned via ambulance at about 3:00 a.m. with complaints as on the previous admission, and was wheelchair bound ◆ A similar history and examination findings as at the previous admission were documented; this included her increased anxiety, and peculiar cog-wheel rigidity of the right limbs with no accompanying intention tremor ◆ The neurologist gave a provisional diagnosis of a conversion disorder ◆ This time she got better sooner than at her last admission; she was discharged home after six days, when she was at 38 weeks' gestation ◆ Mrs Al was re-admitted after four days with complaints of weakness on the right side, along with the onset of irregular contractions and a headache; she leant heavily on her husband but could walk with support, and was kept in for observation; she was obstetrically stable, and the CTG tracing was normal; she was not in labour ◆ She continued to mobilise, her headache was relieved with oral analgesia, and she began walking without support after her relatives left ◆ She was discharged after a couple of days when she was mobilising well ◆ She returned after a week in established labour, and had a normal delivery of a male baby weighing 2750 g ◆ She, her husband, and the extended family were delighted, and she appeared more relaxed ◆ The postpartum period was unremarkable, and she was discharged to community care but advised to return for a follow-up regarding her hemiplegia/hemiparesis ◆ Symptoms of hemiparesis did not recur again; the midwives learnt that giving birth to a son had elevated her status with her in-laws, and her community; this increased her self-worth and self-esteem ◆ She was discharged after her three-month hospital follow-up, to GP care
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ She was a migrant who had graduated overseas, and had married into a British-Asian family; she carried out the expected duties of a housewife, and looked after an extended family; her education was disregarded ◆ She had booked early, and was classified as a low-risk pregnancy ◆ However, personal/social factors including interacting with a culturally unfamiliar, and unsupportive family affected her psychological health; she was stressed and very worried with diminishing self-worth and self-esteem ◆ She began manifesting psychosomatic symptoms of a conversion disorder ◆ After the birth of a son, she did not face ridicule as experienced before, and her headaches with hemiparesis disappeared; her status within the family and society rose ◆ Her past/personal/social or family history did not suggest an increased risk for psychosomatic vulnerability, but later life events initiated the disorder
Impact on the healthcare system	◆ Although her pregnancy was progressing normally, her extremely anxious behaviour with hemiparesis required several admissions and investigations, besides additional professional support, which increased healthcare costs ◆ Although no psychological intervention was needed, and she seemed to be well at the three-month follow-up, her health visitor had to keep a careful watch for recurrence of the disorder

Table 4.3 Continued

	Vignette 3: Acute exacerbation of psychosomatic problem antenatally: a British Asian
What did this form of management prevent?	◆ The hospital care would have been reassuring for her, as her condition was accepted without ridicule unlike her status with her new family; this reduced her anxiety and, made her comply with advice which resulted in a satisfactory obstetric outcome ◆ The spontaneous cure of the symptoms because of her change of status postpartum prevented further progression of her condition, and the extended follow-up would have reassured her
Could anything further have been done?	◆ Health carers could have had longer sessions with her husband and in-laws in explaining her condition so that they understood her needs, and were more supportive during her pregnancy. This may have led to an earlier resolution of her symptoms.

Learning points

Conversion disorders are rare challenges for health professionals. The symptoms do not follow a known disease pattern, and the associated disability can be severe. Those health professionals unfamiliar with the condition have to refer any patients to relevant specialists for further clinical advice. Organic causes of the often dramatic presentation have to be ruled out. Often manifestations mimic major neurological, medical, and cardiovascular diseases, so clinical assessments have to exclude these before reaching the diagnosis of a conversion disorder. Once a conversion disorder is confirmed, symptomatic treatment is required until spontaneous resolution occurs.

Non-pharmacological management

Psychotherapy, as for instance behaviour or insight-oriented therapy, can provide relief. Hypnosis, and behavioural relaxation exercises may also be beneficial. The longer the duration of the disorder, the more the patient will have regressed, so providing appropriate treatment becomes increasingly difficult. Medication for comorbid conditions, as for example, anxiety could aid the resolution of conversion disorders.

Eating disorders

Anorexia nervosa is considered as a psychosomatic eating disorder [137]. The individual is obsessive about weight loss with a refusal to maintain the minimal weight for her height and age. The health condition can be described as an intense fear of gaining weight even when significantly underweight; disturbed perception of body image; along with an amenorrhoea for at least three menstrual cycles [138]. It is categorised as the restricting type, where weight is maintained by calorie restriction or of the binging/purging type. In the latter condition, there is excessive eating and purging with, sometimes, self-induced vomiting. Excessive use of laxatives, diuretics, and enemas may occur. Changes in the functioning of the hypothalamo–pituitary– ovarian axis are implicated. Assessment of the physical risk of serious consequences from the behaviour is important [138]. The fashionable image of 'thinness' glamorised on the web as, 'wannarexia' may have increased the prevalence [139]. Risk factors, which can precipitate and maintain the disease, include stressful life situations, impulsive behaviour, substance misuse, depression, a troubled mother–daughter relationship, and a family history of psychiatric disorders [140].

It is purportedly prevalent in 0.5% of young women but its frequency depends on the sample studied. The age range varies from eight years to the mid-30s, and hence, includes women who are pregnant [140]. However, symptoms of eating disorders tend to improve during pregnancy but return to baseline levels or worsen in the puerperium [141]. The use of appetite suppressants, laxatives, or diuretics in early pregnancy could have adverse effects on fetal development [142]. The

limited literature available on the impact of a pre-existing eating disorder on pregnancy, suggests that women with active eating disorders are at increased risk of miscarriage, intrauterine growth restriction, premature onset of labour, and a higher perinatal mortality [143]. Exceptionally, the woman is identified in an advanced state of pregnancy but at this stage, persuasion to change her behaviour in order to improve nutrition and gain weight, could be a challenge [144]. The mother's perception of her weight and her body image can be transferred to caring for her child. Difficulties in infant feeding can occur, with a risk of stunted growth. Close monitoring of maternal and infant welfare, until remission of anorexia occurs, could prevent adverse obstetric outcomes with biopsychosocial sequelae.

Bulimia nervosa is characterised by recurring cycles of overeating, followed by guilt, depression, and anger [140]. It can also be of a purging or non-purging type, and may cause nutritional deficiency. Manifestations include body image problems or sexual problems. When compared with anorexia, its impact on pregnancy is less severe. Maternal weight is usually normal. The offspring tend to be heavier compared with those of anorexic mothers. This can increase operative deliveries in these women [145]. Clinical features of hyperemesis gravidarum can develop concomitantly [144].

Hyperemesis gravidarum

Due to the physiological adaptions of pregnancy, about 50% of females experience nausea and vomiting in the first trimester. Although a psychological aetiology has been suggested for these symptoms, it has not been confirmed. If symptoms are severe, it is classified as hyperemesis gravidarum. Hyperemesis gravidarum can be defined as severe and protracted vomiting sufficient to cause fluid, electrolyte, and nutritional disturbances, along with weight loss. The health condition manifests in 1–20 per 1000 pregnancies. It presents during the first half of pregnancy [146,147] but occasionally persists beyond this gestation. Hospitalisation is required for its management, particularly if the woman is dehydrated, and ketotic. Associations with other health conditions, including multiple or molar pregnancy, choriocarcinoma and hyperthyroidism, have to be ruled out before confirming the diagnosis. Psychosomatic interactions can be associated, principally when the woman has body-image problems or symptoms of body dysmorphic disorder. It may present with ptyalism, fatigue, weakness, sleep disturbance, or eating disorders [144]. A similar psychosocial aetiology to eating disorders [148] has been suggested. This relates to an immature personality with unresolved conflicts about pregnancy. It may exist with anxiety and depression as comorbidities, and can be prevalent in those who have less social support.

Although it is associated with pregnancies where the beta human chorionic gonadotropin (βhCG) level is high as occurs with gestational trophoblastic disease or twin gestations, the role of the βhCG level in its aetiopathogenesis, remains unclear. Studies on associations with other hormones, e.g. raised progesterone, oestrogens, prolactin, thyroid hormones, or low leptin levels have been inconclusive in confirming a single primary cause [144]. Risk factors vary among different populations. A past or family history of hyperemesis increases the risk, as does carrying a female fetus. Being of Asian/African ethnicity increases the risk, while being an American-Indian or an Eskimo lowers the risk. Pre-eclampsia, hyperthyroidism, gastroenteritis, *Helicobacter pylori* infection, hepatitis, and appendicitis have to be considered in the differential diagnosis. If diagnosed during pregnancy, adequate feto–maternal monitoring is required along with symptomatic treatment. The patient can succumb to the illness if poor management leads to life-threatening metabolic derangements. Serious morbidities include Wernicke's encephalopathy, oesophageal rupture, coagulopathy, or rhabdomyolysis, severe dehydration, and thromboembolism. Its effects on conception and fetal growth can also lead to congenital malformations and growth restriction.

A vignette regarding a patient with hidden complex issues who presented with vomiting, and an acute comorbidity is discussed in Table 4.4.

Table 4.4

	Vignette 4: Exacerbation of psychosomatic problem during pregnancy and in labour: a British Caucasian
Presentation and antenatal care	*Mrs EC, a 27-year-old nullipara with a previous early termination, married, auxiliary nurse, who smoked 15 cigarettes/day* ◆ She was at 18 weeks' gestation, and presented with a history of inability to keep in food/fluids ◆ She had vomited nine times overnight prior to seeking hospitalisation, and was a self-referral ◆ She was dehydrated with ketonuria, and a U/SS confirmed an active singleton ◆ A diagnosis of hyperemesis gravidarum was made, intravenous access obtained, and parenteral hydration given until antiemetics aided oral intake ◆ She was extremely anxious about the pregnancy, and feared for her baby's welfare because of her continuing illness ◆ She had been nauseous, and had vomited intermittently since her pregnancy was confirmed at six weeks' gestation, when she had presented to the hospital with a threatened miscarriage ◆ At this admission, she was discharged after five days when her vomiting subsided, her oral intake was satisfactory, and associated aetiological conditions were ruled out ◆ She remained extremely anxious, attended for antepartum care and mentioned that she had reduced her smoking from 30 to 10 cigarettes daily ◆ She had two further admissions for vomiting, and abdominal pain ◆ Her husband appeared extremely attentive when he visited and seemed to spoil her as did the rest of her family ◆ The vomiting, which stopped at 26 weeks' gestation, appeared to be related to the pregnancy as no other aetiology was confirmed ◆ She had three other admissions because of abdominal pain, and reduced fetal movements but the non-stress CTGs were reassuring ◆ The plotted ultrasound measurements showed a trend in growth around the 60th centile ◆ She continued to smoke as she believed it had stopped the vomiting, and would not consider its detrimental effects on the pregnancy and the fetus ◆ At 38 weeks and 5 days she was admitted in great distress because of severe abdominal pain and vomiting with irregular contractions; early labour was confirmed and continuous CTG commenced ◆ Soon after, the obstetrician on-call was summoned urgently as Mrs EC's CTG showed a prolonged bradycardia with reduced variability, and fresh vaginal bleeding ◆ She appeared extremely distressed, and fearful with a rapid, thready pulse ◆ The uterus was tender and the cervix had dilated to 3 cm with heavily blood-stained liquor draining; placental abruption was suspected and a decision was taken for an urgent delivery by a caesarean (category 1) ◆ This was explained to Mrs EC and a crash call for an urgent caesarean initiated; a live male baby weighing 3050 g was delivered within 90 s of giving the skin incision, Apgar scores were 6 at one and 9 at five min, with paired cord blood samples showing values above the acidotic range (arterial pH 7.21, base deficit 3.8 mEq/L) ◆ A placental abruption was confirmed with heavily blood-stained liquor, and retroplacental clots seen behind an unhealthy, gritty placenta that had almost completely separated prior to delivery

(*Continued*)

Table 4.4 Continued

	Vignette 4: Exacerbation of psychosomatic problem during pregnancy and in labour: a British Caucasian
	◆ While suturing, uterine atony was noted, oxytocics (syntometrine followed by syntocinon, prostaglandin and misoprostol) were given, and the flaccid uterus rubbed until well contracted; this prevented further postpartum haemorrhage; crystalloids, and blood were transfused as clinically indicated ◆ The routine protocol for management after antepartum, and postpartum haemorrhage was instituted while in the high dependency unit (HDU) ◆ Mrs EC was transferred to the postpartum ward after observations were stable the next day, and investigations ruled out a haematological crisis ◆ There was normal progress postpartum with the baby being returned to Mrs EC after initial observation in the Special Care Baby Unit (SCBU) ◆ She bottle-fed the baby ◆ When the obstetrician visited Mrs EC postoperatively, she requested a confidential consultation before she was discharged
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ Since her childhood Mrs EC had: ◆ Monthly urinary tract infections, which were investigated, and treated with antibiotics intermittently when infection was confirmed ◆ Recurrent vaginal discharge, which was investigated with triple swabs, and treated with antibiotics and antifungal medication ◆ Recurrent tension headaches treated with relevant medication ◆ Been investigated with cystoscopy and urethral dilation for her urinary symptoms but no stones or diverticulae were visualised ◆ Suffered from very heavy periods with dysmenorrhoea but did not seek treatment ◆ A Bartholin's abscess drained ◆ One incidence of torticollis ◆ The above symptoms baffled the GP, and the specialists he referred her to; there were no signs of infection or organic lesions on repeat examinations/ investigations ◆ Her elder sister had similar symptoms, which were cured when as a teenager she visited a shrine in mainland Europe; the GP had suggested that her parents, who volunteered this information, should take her there too ◆ She had felt very upset for months when in her teens as she had lost her brother when he was 17 years old ◆ Occasionally she felt low, and called herself a 'worrier' but did not think she needed any treatment ◆ Mrs EC could smoke up to 30 cigarettes/day; she had tried to quit but her husband smoked, and she was 'tempted back' as his companion ◆ When talking confidentially to the obstetrician, she mentioned of a 'special friend' before her marriage but did not elaborate further; time constraints prevented further discussion ◆ Her past personal/social and family history did not confirm an increased vulnerability for psychosomatic events; further disclosure in an environment, which was reassuring for her may have revealed any hidden risk factors
Impact of her past/ current symptoms on the healthcare system	◆ Her smoking may have increased the risk of abruption with a gritty placenta at delivery suggesting this; despite knowing the risks, she was unable to quit ◆ Mrs EC seemed to be suffering from psychosomatic generated symptoms since childhood, which caused her to seek treatment for various manifestations but the reports of investigations were usually negative ◆ After delivery, her carers were alerted to her higher risk of postpartum depression, anxiety and post-traumatic stress disorder due to her urgent caesarean, and her habitually anxious personality

Table 4.4 Continued

	Vignette 4: Exacerbation of psychosomatic problem during pregnancy and in labour: a British Caucasian
Implications for training in earlier recognition of psychosomatic symptoms and their negative impact	◆ It may have helped to address the psychosomatic facet of Mrs EC's personality during her antepartum visits for managing hyperemesis, had it been identified ◆ Her symptoms since childhood would point towards a psychosomatic orientation of her complaints ◆ There may have been other causes for her antepartum symptoms but unless she disclosed any initiating or maintaining psychosocial factors one could not confirm the suspicion of something untoward in her personal/social life or provide her with selective patient-centred support
Was she at risk of future disorders after delivery?	◆ Her acute admission with an urgent caesarean delivery increased the risk of tokophobia in future pregnancies with its implications ◆ Her risk of antepartum and postpartum haemorrhage was increased ◆ There was a greater chance of her requesting an elective caesarean for a future pregnancy even if vaginal delivery was an option ◆ She was also at increased risk of anxiety, depression, and post-traumatic stress disorder besides hyperemesis in a future pregnancy
What did this form of management prevent?	◆ Immediate attention to her distress at admission and the fetal bradycardia prevented maternal morbidity/mortality from abruption of the placenta, and a possible stillbirth ◆ The patient-centred attention after delivery would have reduced the risk of psychosomatic sequelae but one could not be certain, hence, post-discharge healthcare alerts were flagged
Could anything further have been done?	◆ Mrs EC was unable to quit smoking during pregnancy despite being advised to do so. Another method of reducing her ingrained psychosomatic issues that perhaps made her smoke may have helped but she was vague often, and couple psychotherapy could not be broached.

Learning points

Repeated health-seeking behaviour without confirmation of a biological cause in the majority of medical evaluations could lead to the development of an anxious temperament, as Mrs EC had acquired by adulthood (see Table 4.4). This can increase vulnerability to psychosomatic disease, and substance misuse, which in a young pregnant woman could also manifest as hyperemesis gravidarum. Smoking also increases the risk of abruption but an anxious personality-type could be dependent on it. Mrs EC was unable to quit during pregnancy. Pre-existing anxiety, if characteristic of a patient's behaviour, can confound the sudden onset of increasing anxiety, and panic associated with increasing abdominal pain that is characteristic of a placental abruption. In Mrs EC's case, the anxiety and a panic attack among the presenting symptoms of abruption, could have been confounded by pre-existing symptoms. However, other distinguishing features of the clinical condition, such as tachycardia with a thready pulse, restlessness and a tender, hard uterus, suggested an abruption. Thus, the physical signs enabled an early diagnosis to initiate effective management, even though the bleeding was initially concealed. Besides, a clinical/fetal feature had emerged that necessitated urgent delivery. Placental abruption is usually revealed by antepartum haemorrhage, and it can also precipitate postpartum haemorrhage that can rapidly exsanguinate the patient. Immediately commencing and escalating measures to achieve haemostasis, starting from uterine massage and oxytocics, to haemostatic suturing, helped to preserve the uterus in Mrs EC's case. Proceeding to more invasive management, including a hysterectomy or an arterial embolisation, was not needed. Appropriate postpartum support was given to Mrs EC, as is required for most women after such a major obstetric experience. Such support was necessary to prevent psychosomatic repercussions after such a formidable birth experience.

Since vignette 4 (Table 4.4) depicts the presentation of an antepartum haemorrhage in a patient with an eating disorder, the non-pharmacological management of the latter is now briefly discussed.

Non-pharmacological management

The treatment of eating disorders includes the symptomatic treatment of the manifestations of psychosomatic interactions. Dietary modification including small frequent, nutritious meals, and the added intake of vitamins (thiamine, pyridoxine, and ascorbic acid), can help with hyperemesis gravidarum along with antiemetics. Thiamine supplementation can prevent the complication of Wernicke's encephalopathy that can lead to fetal demise. Careful parenteral rehydration is an important aspect of care along with correction of any electrolyte imbalances, and nutritional deficiencies. Hospitalisation is required in such cases. Anti-thrombotic measures are instituted when mobility is restricted. Concomitant psychosomatic support, which may involve a modification of eating behaviour, individual psychotherapy, or family therapy, are provided, where indicated. Guidance on effective management during pregnancy includes advice on prepregnancy planning to get eating disorders addressed prior to conception. Providing health education regarding adequate nutrition during pregnancy, and the periconceptual period, which would allow optimal fetal development should also be emphasised. Increasing the woman's understanding of body shape/weight dysmorphia, and the physiological changes in appearance during pregnancy, would help her to accept these changes. This could prevent the loss of her self-esteem that is a characteristic of the affliction. Referring to relevant specialist services, early on in her pregnancy [146], to discuss about her 'bothersome' ruminations, would be prudent. A psychosomatic approach, and the patient's perception of the clinician's humanism, can help with discussions to improve her coping mechanisms that would facilitate a reduction of her symptoms. The behavioural change could not only be curative for her disorder but also lead to increased satisfaction thereby reducing her need for a more invasive form of management [149]. The partner's support can also contribute to an earlier recovery from hyperemesis. Ginger extract, acupressure, homeopathy, and hypnosis have reportedly been effective but need further appraisal to permit wider application.

Epileptic seizures and non-epileptic attack disorders

Both epileptic seizures and psychogenic non-epileptic seizures (PNES) or epileptic attack disorders, also referred to as fits, can manifest during pregnancy, intrapartum or postpartum, and effect the mother–fetal dyad. Epileptic seizures occur due to abnormal electrical impulses in various parts of the brain, and are recognised by the clinical presentations related to these. The electrical impulses may affect the whole brain resulting in a generalised seizure or involve only parts of it, when it is referred to as a partial or focal seizure. While the focal seizures do not cause loss of consciousness, the generalised seizures usually do. During an epileptic fit, there is concomitant stiffening of muscles as tonic or clonic. Combined tonic/clonic seizures may occur. Sometimes, there are absences where there is a loss of awareness along with subtle body movements. There can be an associated loss of control of bladder/bowel continence. One of the less studied mechanisms of initiating seizures is by the neurological effect of psychosocial stress. Psychosocial stress, such as persistent psychosocial harassment, can cause emotional distress that affects the prefrontal cortex. This through the limbic system connections (see Chapter 1), could generate epilepsy. If this mechanism of causation of seizures is unrecognised it can be mistaken for a non-epileptic seizure, and not treated effectively with antiepileptic drugs to control the seizures. Epilepsy, if not treated adequately, can lead to continuing seizures, including presentations as a cluster of fits, known as status epilepticus. If status epilepticus occurs in pregnancy, lack of oxygenation during these episodes can have serious effects both on the mother, and the fetus. Furthermore, cardiac arrest can

occur in uncontrolled epilepsy, which may be fatal; this is known as Sudden Unexpected Death in Epilepsy (SUDEP). SUDEP was the cause of demise in 12 of the 14 pregnant women with epilepsy in the last MM report from the UK [1]. Epilepsy is confirmed by electroencephalography, and the gold standard is video electroencephalography; the latter is expensive with very limited availability, even in high-income countries. Epilepsy can be initiated by triggering factors, which include photostimulation during electroencephalography, although fits occur in only 7% of patients after such stimulation. Management consists of taking care to prevent bodily injury during fits. Antiepileptic medication can prevent/control seizures. Although epileptic seizures may be less frequent during pregnancy, there can be problems with effective control that could increase the frequency of fits. This is because the serum levels of antiepileptic drugs fall with the physiological increase in plasma volume, and the altered renal excretion during pregnancy. Thus, a modification of the previous dose of the epileptic gravida's medication to achieve an effective control of her fits, may be required. Certain drugs, e.g. sodium valproate, are teratogenic, so this risk has to be discussed preconceptually when considering the need to continue with medication. Where a decision is made to continue with antiepileptic drugs during pregnancy, along with providing information about routine screening, in-depth discussions about detailed assessments for the detection of any fetal anomalies, have to be carried out. Moreover, because of the relative deficiency of folic acid when antiepileptic medication is taken, those women planning a pregnancy should start taking 5 mg folate daily preconceptually, to reduce the risk of fetal anomalies. In the unfortunate event where a fetal anomaly is discovered, expert advice about management options including intrauterine therapy would be necessary. Culturally appropriate, and patient-centred management would most likely promote compliance. Children born to mothers suffering from epilepsy may show delayed progression at school [150]. Supportive psychotherapy may be needed for them, along with creating awareness among their contacts.

While there is wide recognition of epileptic seizures, there are still several grey areas in understanding its aetiopathogenesis that need further research. Comparatively, there appears to be even less understanding of the various aetiopathologies of non-epileptic attack disorders, and their prognosis [151] can be poor in some sufferers. Hence, management of the condition remains confusing. Unlike epileptic seizures, non-epileptic attack disorders are not due to central nervous system dysfunction that cause abnormal electrical waves in the brain, but rather result from an exaggerated response to the 'fight and flight reaction' caused by trigger factors. These attacks are considered as psychogenic disorders that represent an emotional response to a stressful situation. Often, stressful factors related to bullying or assault can generate non-epileptic attacks. These attacks can also be associated with anxiety or the fear of being placed in unpleasant situations from, which one perceives that there is no escape. There is individual variation with different trigger factors, including abuse in childhood or at the workplace, which initiate and maintain these attack disorders. They are characterised by sudden and time-limited disturbances of motor, sensory, autonomic, cognitive, and/or emotional functions. The presentation may be short or long-lasting. Presentations include thrashing of limbs, side-to-side head movements, opisthotonus, pelvic thrusting, forced eye closure, talking or screaming, non-stertorious breathing, and a sudden return to consciousness in those who have temporarily lost consciousness during the attack. Rarely a psychogenic pseudostatus epilepticus may present. The diagnosis can be confused with an epileptic seizure, particularly by those unfamiliar with its varied presentations. However, antiepileptic medication is contraindicated in managing these seizures, and is harmful if given because of a misdiagnosis of epilepsy [152]. Distinguishing between epilepsy and non-epileptic attack disorder can be done by a video-electroencephalogram (v-EEG). When v-EEG monitoring is carried out during a fit, abnormal electrical discharges in the brain are only detected in epilepsy. Awareness and keeping a diary of trigger factors which could be avoided to prevent attacks

can reduce the frequency of fits. Comorbid mental disorders, such as anxiety, depression, post-traumatic stress, or bipolar disorders, may be associated. They would need appropriate therapy, contemporaneously. Despite the uncertainty, the prognosis of those having non-epileptic attack disorders could be improved by avoiding associated trigger factors, and treating any concurrent mental illnesses. A cure is thus possible, and the condition is non-fatal. Notwithstanding, non-productivity may persist [153].

A vignette regarding a previously low-risk patient who had an intrapartum fit is presented in Table 4.5.

Table 4.5

	Vignette 5: Presenting on a weekday in early labour, which progressed to an instrumental delivery: a British Asian
Presentation and management	*Mrs SK, a 21-year-old nullipara, married, part-time shop assistant, at a gestation of 37 weeks and 3 days* ◆ Mrs SK was a self-referral because of labour pains. She was assessed on the labour ward and found to have irregular, painful contractions with a partially effaced cervix at 1 cm dilatation, intact membranes, and a reassuring CTG ◆ She was transferred to the antepartum ward where women in early labour who did not require strong analgesia were cared for ◆ As she did not request pain relief over the next few hours, and her contractions seemed to have petered off without a change in the cervical findings; she requested to go home although her husband disagreed ◆ Her husband wanted her labour to be 'started off' but after a discussion on the risks of induction, they agreed to go home, and await a spontaneous onset ◆ Mrs SK had booked for this pregnancy at 16 weeks when a U/SS confirmed an active singleton ◆ During the pregnancy she appeared anxious, and had requested antepartum care at her MW's clinic rather than at the hospital; she also discussed about having a home birth ◆ Home birth was discouraged as she lived far from the hospital, and would be unable to access services urgently; the couple accepted delivery in hospital ◆ Mrs SK was readmitted at 38 weeks in early labour with regular uterine contractions, and she progressed to the second stage ◆ She had been pushing actively in a semirecumbent position with MW encouragement but had been getting increasingly tired, and was starting to feel that she could not deliver 'herself', and needed the doctor's help ◆ Although there was fetal descent, progress was slow, and she seemed to be giving up but would make an extra effort whenever the MW encouraged her during contractions ◆ Suddenly she acted strange, and the MW sounded the emergency buzzer ◆ Staff on-call duty for the labour ward responded urgently, including the obstetrician, the anaesthetist, and the paediatrician ◆ Mrs SK let out a short scream, began to thrash her limbs about, move her head from side-to-side, and shut her eyes with frothy saliva at the mouth, then she lapsed into what appeared to be a loss of consciousness ◆ The obstetrician examined, and confirmed that abdominally, the head was not palpable, moderately strong uterine contractions were continuing although the MW had noted a reduction in frequency; the CTG was reactive ◆ Vaginally the head was 2 cm below the ischial spines; it was a cephalic presentation with OA position, a small caput but no moulding, clear liquor was draining; the condition was suitable for a forceps-assisted delivery with numbing of the perineum using a local anaesthetic infiltration

Table 4.5 Continued

	Vignette 5: Presenting on a weekday in early labour, which progressed to an instrumental delivery: a British Asian
	◆ Low-cavity forceps' blades were applied easily, the blades locked, and the head delivered in two pulls with moderate traction, the forceps blades were removed, the baby's neck was checked as routinely done to exclude any loop of cord around it, and then the rest of the baby was delivered ◆ The cord was double clamped, and divided, and the baby transferred to the attending paediatrician as per protocol ◆ Placenta with membranes were delivered by controlled cord traction, and checked for completeness ◆ The attending paediatrician assessed the 'dazed' female baby; Apgar scores were 7 and 9 at one and five min, respectively, with normal results for the paired cord blood gases ◆ The baby weighed 2500 g, and all baby-checks were satisfactory ◆ Mrs SK seemed alert after 10 min and a hasty physical examination, including her ocular reflexes, were normal ◆ She then appeared very exhausted and drowsy, muttered words about being able to 'do it herself', and then slept ◆ The observations suggested a seizure disorder ◆ Her baby was sent to the SCBU for routine observations, as per protocol ◆ Mrs SK woke up after 35 min but was reluctant to breast-feed, and wanted the baby to be artificially fed that night in the SCBU ◆ She remained under observation overnight in a side-room in the high-dependency area of the labour ward but other than a tachycardia after delivery, there were no abnormal clinical findings ◆ When Mrs SK's husband and in-laws left after the delivery, Mrs SK's mother volunteered further information; her daughter had intermittent fits in her late childhood/adolescence when she went for long visits overseas to her grandparents; the seizures had been frequent when she 'took tension' and was 'very worried'; investigations on these occasions were negative; when she entered her late teens, and remained in the UK helping in the family shop, her seizures had disappeared; they presumed that she was cured ◆ Before her postpartum discharge she was assessed by a neurologist, and a psychiatrist who evaluated all investigation reports, and found them to be normal ◆ She was discharged after five days on haematinics when successful breast-feeding had been established ◆ She was given a follow-up appointment with a neuropsychiatrist to evaluate and confirm that her symptoms were in remission; three sessions of psychotherapy were also arranged at her GP's surgery; she refused medication saying that she was breast-feeding
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ Her past history did not suggest any major traumatic episode but she appeared shy and withdrawn with lack of confidence ◆ She was reticent, and fearful of the family-elders ◆ She had conceived at 20 years of age ◆ Her previous anxiety from a state of 'tension' could have been initiated in labour; as her pain intensified she felt frightened and exhausted but did not want an epidural sited ◆ Her worry would have increased when told that her contractions were getting less frequent, and augmentation was needed; she wanted a natural birth ◆ Her timid personality and the inability to cope well with second stage bearing down pains, along with the stress of active pushing, may have triggered the non-epileptic attack ◆ Both mother and baby were discharged on the fifth day ◆ Her recorded past personal/social and family history suggested an increased vulnerability for psychosomatic events but culturally, disclosure was inhibited

(*Continued*)

Table 4.5 Continued

	Vignette 5: Presenting on a weekday in early labour, which progressed to an instrumental delivery: a British Asian
Impact on the healthcare system and probable explanation for her behaviour in labour	◆ Her behaviour in labour suggested fear, which could have added to the stress of the labour experience, and may have triggered the seizure ◆ Although belated, the vague family history about Mrs SK's previous seizures indicated that they were considered as non-epileptic attacks ◆ She underwent further investigations to rule out any other cause for the non-epileptic attack in labour ◆ Initially, a trained attendant was arranged by her family so that she could be put into the recovery position if the attack recurred, and would not be left alone with the baby ◆ The non-epileptic attack did not recur postpartum ◆ At her three-month follow-up visit all investigations, including imaging studies, confirmed a non-epileptic attack ◆ At her request she was transferred to her GP's care who arranged talking therapy to improve her coping skills, and family therapy for better support ◆ No other treatment was indicated other than avoiding stress-related triggers
Implication for training	◆ A good history remains a cornerstone of medical care but sometimes one encounters individuals who are unable to reveal everything for fear of recriminations from their family members. Mrs SK could have been under such pressure, as her mother did not want her husband to know of the past history of non-epileptic attacks, just in case it soured their relationship
Was this form of management appropriate and what did it prevent?	◆ Sounding the buzzer urgently, and immediate attendance by the relevant staff reflected good communication and coordination in providing apt care ◆ The MW had no reason to believe that this low-risk mother would not have a normal delivery, and she performed well in the suddenly altered clinical scenario ◆ The hospital care prevented a negative outcome for Mrs SK and her baby; this form of care would not have been possible if she had a home birth ◆ She seemed frightened initially and this needed constant attention from staff ◆ Her condition at labour called for more intense midwifery surveillance and support in the postpartum period; she settled with the baby, and also persisted with breast-feeding until successful ◆ Midwifery, and health visitor support postpartum continued for a longer period to make her confident in her coping skills ◆ She was also taught to avoid trigger factors brought about by stress
Could anything further have been done?	◆ An earlier revelation of Mrs SK's past history of fits would have prevented the sudden crisis in labour with an increased risk of materno–fetal morbidity. Nevertheless, being drilled for any eventuality brought about a good outcome by the labour ward team.

Learning points

Past obstetric experience along with practise during obstetric drills helped the LW on-call team in managing Mrs SK's clinical problem, urgently (see Table 4.5). Regular obstetric drills to manage sudden medical emergencies continue to reduce maternal and infant morbidity from common clinical conditions in the UK. Nonetheless, less common scenarios, such as non-epileptic attack disorders, and their treatment, also need greater representation in the teaching schedule for the training of health professionals. Mrs SK presented as a rare obstetric emergency partly because of the lack of disclosure of past fits, which had happened during her adolescence. However, the

obstetric management carried out expeditiously conformed to the requirements of the clinical situation that arose suddenly. It was specific for this individual and her baby. Both required immediate patient-centred care. Appropriate management/follow-up after the incident was arranged as necessary.

A patient's fear of personal/social vendetta can prevent disclosure of significant life events during history-taking; this is a psychosocial issue. Such information is nonetheless, useful, for effective management during emergency clinical situations. Hence, patients need to be reassured that the healthcare systems will maintain confidentiality when personal information is disclosed, particularly if it is of a sensitive nature. The healthcare team is obliged to respect the patient's rights regarding providing their confidential information. Therefore, data storage and retrieval systems have to be designed for the distribution of confidential information, without compromising effective patient care. Safety issues can arise from non-disclosure. With migration and a multicultural clientele attending hospitals, globally, communication skills to overcome reticence should be ongoing in healthcare provision. This remains a priority of psychosomatic training.

Non-pharmacological management

Although epileptic seizures have been recognised since ancient times, awareness of non-epileptic attacks is limited. Therefore, there is a lack of consensus for best practice in managing PNES, and hence the prognosis remains poor in some individuals. Epilepsy has to be ruled out first, as medication is necessary to effectively control epileptic seizures. Time-limited psychotherapy that includes cognitive behaviour therapy (12 sessions) along with other speaking therapies, have been found to be useful in reducing non-epileptic attack disorders [154]. Knowledge of factor/s triggering the attacks can be applied as a preventive measure for reducing the frequency of attacks, and to sustain a complete cure. Prevention of injury during the attacks is paramount for all seizure disorders. The adverse effects on the mother–fetal dyad of antiepileptic medication are briefly discussed towards the end of this chapter.

Further discussions on psychotropic medication and pregnancy

Initially for most psychosomatic conditions, self-help approaches (guided self-help), computerised CBT (C-CBT), exercise, or psychological treatments (counselling, CBT, listening visits) should be considered prior to prescribing medication. These psychosomatic approaches could also be useful when withdrawing potentially teratogenic medication. Psychotropic medication is necessary when there is only a partial or no response to non-pharmacological methods, or there is an acute clinical crisis where only medication is known to work. The research base for the effects of psychotropic medication in pregnancy is limited but ever-changing [155], and for this reason, it is not possible to give definitive advice. NICE [49] provides some general principles, which should govern prescribing in pregnancy or during breast-feeding. If medication is necessary:

- the lowest effective dose should be used
- monotherapy should be used in preference to combination treatments
- drugs with the greatest evidence of safety for the mother/fetus should be considered first
- the woman's history of previous treatment response should guide future treatment
- changes in treatment to reduce risk of harm must be balanced against risks of switching
- the individual woman's views, wishes, fears, and priorities are key factors in decisions about treatment.

NICE also maintains that if a pregnant woman requires rapid tranquilisation for the management of disturbed or violent behaviour, as in schizophrenia and bipolar disorder, she should not be secluded after it; restraint procedures should only be adopted to avoid possible harm to the fetus; an antipsychotic or a benzodiazepine with a short half-life should be considered for the pregnant woman to reduce the risk of neonatal extrapyramidal symptoms or floppy baby syndrome; during the perinatal period, care should be given in close collaboration with the paediatrician, and an anaesthetist. NICE also recommends that access to psychological therapies, where appropriate, should be promptly available.

Antidepressants and anxiolytics

Drug treatments for depression and anxiety include selective serotonin reuptake inhibitors (SSRIs), and tricyclic antidepressants (TCAD).

Antidepressants are among those psychotropics most likely to be prescribed coincidentally at conception. Older drugs, such as the tricyclics, have the lowest known risks to fetal development in pregnancy, but SSRI antidepressants are much more commonly prescribed. Of these, fluoxetine is regarded as the safest for the fetus [49], predominantly because of its longer and more widespread usage. However, with overdosing or when multiple antidepressant medication is being given simultaneously, the adverse serotonin syndrome may emerge [156]. Paroxetine along with CBT can be used to treat severe dysphoria, with beneficial effects on both mood and anxiety symptoms besides providing relief from a co-existing obsessive–compulsive disorder [157]. Nevertheless, if given in the first trimester, a doubling of ventricular septal defects has been associated. Although contentious, there is concern about SSRIs being associated with an increased risk of persistent pulmonary hypertension in the neonate, if it is given after 20 weeks [158,159]. All antidepressants may cause withdrawal effects or toxicity in the neonate, although these are largely self-limiting [160]. Typical symptoms of neonatal withdrawal may include irritability, constant crying, shivering, increased tone and tremor, poor feeding and, rarely, seizures. In a well-controlled study of children exposed to fluoxetine or TCADs in pregnancy, there was no evidence of impaired intelligence, or a delay in growth, language, or behavioural development, over a four-year follow-up period [161].

Antipsychotics

Many antipsychotics raise prolactin levels and reduce fertility. Second generation antipsychotics, such as paliperidone have comparatively less adherence problems [162], compared with older antipsychotics. Nonetheless, they may be associated with fetuses that are large for gestational age and there is an increased risk to the mother of impaired glucose tolerance, and gestational diabetes [163]. Among the older drugs, haloperidol is widely used, but it can cause Parkinsonism, akathisia, and acute dystonias in the mother. It is also linked to intrauterine growth retardation [163]. The evidence of any association with fetal malformation is very limited. Where these drugs are prescribed for the management of severe and enduring mental illness (e.g. schizophrenia and related disorders), the risks of discontinuing will usually outweigh any risks of the medication on the developing fetus. In the majority of cases, usual practise would be to continue medication throughout pregnancy. Haloperidol if combined with ondansetron may give better symptom control for schizophrenia. For novel antipsychotics, where the risks in pregnancy have been less well evaluated, the option may exist to switch to a more established, older preparation during pregnancy. For women on depot medication, the drug may persist in the neonate for considerable periods. It may be possible to change to an oral preparation during the pregnancy. Such decisions need to take individual circumstances into account, particularly the significant risk of relapse of the illness.

Mood stabilisers and antiepileptics

Mood stabilisers, most commonly prescribed for prophylaxis of bipolar disorder, include lithium, and the antiepileptics valproate, carbamazepine, and lamotrigine. In early pregnancy, lithium is associated with an increased risk of cardiac malformation, particularly Ebstein's anomaly. Overall, the risk of cardiac malformations is 6–10% that of the general population. In women receiving treatment for bipolar disorder, sudden discontinuation is associated with a greatly increased risk of relapse. Specialist advice should be sought urgently if a woman on lithium presents in early pregnancy. Careful adjustment of the dose after delivery is required as the drug's metabolism alters postpartum, and it is also secreted in the breast milk. Nonetheless, its toxicity is lower than that of carbamazepine and valproate. Women who do not respond to lithium need other mood stabilisers. Lithium toxicity to the baby can result in lethargy, cyanosis, abnormal reflexes, and hepatomegaly [110]. Evidence suggests that if these side-effects arise in the offspring of women taking these drugs, the babies will need closer observation. Earlier management of these clinical conditions is required, as there is a higher risk of future severe mental illness [111].

The antiepileptic mood stabilisers carbamazepine and valproate are associated with a risk of neural tube defects (0.5% for carbamazepine; 1–2% for valproate), including spina bifida. They are also associated with cardiac, gastrointestinal, and facial anomalies, along with a range of other minor malformations [164]. Given that many pregnancies will not be confirmed until after the neural tube closes around day 28, reducing this risk is dependent on preconceptual advice and management. This may include high dose folate (5 mg/day) from at least 12 weeks prior to conception, although its prescription has not been shown to directly reduce the rate of neural tube defects in women on antiepileptics. In the case of valproate, there is evidence of a dose–effect relationship, with greater risk at doses above 1000 mg/day. Valproate has also been linked to a significant impairment in cognitive function, with 22% of children noted to have exceptionally low verbal IQ, compared with an expected rate of 2% in the general population [165]. Given these concerns, it is recommended that valproate is not prescribed to bipolar women in the childbearing age-group, unless there are no effective alternatives. Lamotrigine in pregnancy is associated with an increased risk of cleft palate, and benzodiazepines should not be used during pregnancy because of the risk of cleft lip and palate. Moreover, if high doses are taken during pregnancy, there are withdrawal effects in the newborn.

The use of antiepileptic drugs for the treatment of epilepsy during pregnancy also needs careful consideration, as discussed above. The effective prepregnancy doses of these drugs have to be modified during pregnancy due to pregnancy-related changes in the vascular compartment. Evaluation of seizures occurring for the first time in pregnancy/labour by a neuropsychiatrist is essential as antiepileptic drugs do not prevent the fits of non-epileptic seizure disorder, and can be harmful to the woman and her fetus.

Antiepileptics have also been successful in managing panic attacks but reported studies have had small sample sizes [166]. Their use for this purpose during childbearing needs further evaluation.

Opioid substitutes

Reported evidence about the effects and cost-effectiveness of opioid substitution is limited to the general population [167], which indicates that although substitution is clinically effective there is uncertainty about the cost-effectiveness. Opioids that are prescribed for substitution treatment may be misused and these include methadone and buprenorphine (the partial agonist). There are potential safety concerns regarding flexible-dose methadone and buprenorphine substitution. Both can cause withdrawal effects, and may be fatal with overdose [168]. Medically supervised withdrawal from opioids in opioid-dependent women is not recommended during pregnancy.

Such withdrawal can be associated with preterm labour, fetal distress, and even fetal demise, in addition to high relapse rates. However, if methadone maintenance is unavailable or if women refuse to accept methadone or buprenorphine maintenance, medically supervised withdrawal should ideally be undertaken during the second trimester.

Antiemetics

The intractable vomiting of hyperemesis gravidarum does not usually respond to non-pharmacological measures on their own, so antiemetics are given concurrently. These include [169] antihistamines such as diphenhydramine; phenothiazines such as promethazine; dopamine antagonists such as metoclopramide; and selective 5-hydroxytryptamine antagonists such as ondansetron. Phenothiazines can cause drowsiness, extrapyramidal side-effects, and oculogyric crisis. Metoclopramide or ondansetron, are particularly useful in refractory cases, but adverse effects such as excessive sedation, akathisia, dystonic reactions, or neuroleptic malignant syndrome can occur. Again, there are concerns about cleft palate with the latter. Due consideration should be given to the appropriate start time during pregnancy, which for certain drugs should preferably be after the first trimester, in order to prevent any detrimental effects on the developing fetus. Steroids can be used if there is no response to conventional treatment but this has aroused controversy.

Planning biopsychosocial risk-reduction to improve pregnancy outcomes

This includes planning for satisfactory pregnancy outcomes well ahead of the pregnancy as well as dealing with eventualities during the first half of the pregnancy.

Prepregnancy planning and early health education

Preconceptual planning to improve perinatal health is currently advancing. Relevant health education should be ideally started in the late teenage/young adult years to prevent psychosomatic disease, where possible. By so doing, the erring teenager/young adult is made aware of, and is given the incentive to try and attain positive health, by behavioural change. These preventive measures could include increasing one's resilience to reduce tokophobia [170], or containing substance misuse, and modifying behaviour to successfully manage anorexia or bulimia. Accessing help to decide on non-pharmacological/pharmacological treatments, where required, can be effective in improving outcomes.

Women who are planning a pregnancy should be asked about a history of significant mental illness, besides familial and social issues, which may need further attention preconceptually to help her attain best obstetric outcomes. Those at greatest risk of adverse consequences include women with bipolar disorder or schizophrenia, as there is a risk of relapse of the illness postpartum. CBT can prevent the onset of psychosis in those who are at risk of developing psychosis. Women with substance misuse or personality disorder may struggle to cope with the challenges of pregnancy and childcare, without appropriate support. If a woman is taking psychotropic medication, she should be given advice regarding any known teratogenicity, and should have a specialist review to establish the safest and most effective treatment regime for them in advance of pregnancy.

Early pregnancy planning

First contact with maternity services provides an important opportunity to identify women with pre-existing mental illness, or those with a raised risk of postpartum mental illness. NICE [49] recommends that all women are asked about:

- past or present severe mental illness, including schizophrenia, bipolar disorder, psychosis in the postnatal period and severe depression
- previous treatment by a psychiatrist/specialist mental health team, including inpatient care
- a family history of perinatal mental illness

In addition, women should be asked about a family history of bipolar disorder or schizophrenia. Women confirming any of these risk factors should be referred for assessment, and management of risk. Prophylactic medication in the immediate postpartum period could be prescribed if indicated. Where available, specialist perinatal mental health services should provide this role.

NICE [49] also makes recommendations on detection of depression in pregnancy. Two questions are suggested for all women at booking and at subsequent contact:

- During the past month, have you often been bothered by feeling down, depressed or hopeless?
- During the past month, have you often been bothered by having little interest or pleasure in doing things?

If either is answered 'yes', these should be followed up by a third question:

- Is this something you feel you need or want help with?

There is, however, little evidence that identifying risk factors, including poor social support, can reliably identify women who may go on to develop dysphoria in the postpartum period.

Good communication and providing patient-centred care

Although CMACE [2] has been providing guidance on risk-reduction in pregnancy to reduce maternal morbidity and mortality, more needs to be done. The latest report of the Confidential Enquiries into Maternal Deaths [1], mentions missed opportunities in saving lives, as maternal mental illness again reached prominence among the indirect causes of death. This and the preceding reports [2–5], repeatedly comment on the need for good communication, and sharing of information between maternity, primary care, and mental health professionals. Among the recommendations, emphasis has also been placed on preconception counselling, and support for women with pre-existing severe mental illness, which may be aggravated by pregnancy. Poor communication has also remained a contributory factor in a number of maternal deaths by suicide that have been mentioned in the report.

Maintaining good communication with attending health professionals to facilitate a good experience of pregnancy and labour, would also reduce the risk of PTSD [171]. Preventing maternal psychosomatic illness would aid in preventing mental illness in their offspring, and limit subsequent challenging behaviour [172–174], so the benefits would be long-term.

Non-pharmacological methods, such as CBT, are useful for managing certain conditions, but if offered, this needs to be discussed comprehensively with patients to enable the selection of the most suitable treatment for them. Complementary methods, for example, acupressure, acupuncture, meditation or yoga, and herbal remedies for preventing/curing psychosomatic clinical conditions, need further study [175], before being advocated on their own or integrated with conventional treatment. The role of pharmacotherapy in perinatal psychiatric illness is widely recognised, particularly in severe or acute clinical presentations or as an adjunct to non-pharmacological treatment. However, side-effects [176] in the mother being treated along with effects on the baby, need critical evaluation when offering treatment. The woman taking possible teratogenic drugs has to be informed of the management options available if any anomaly is detected in the fetus. Expert advice, and sensitive handling of the conversation with the would-be parents would have to be undertaken when they are facing such daunting circumstances. The psychosomatic approach would ascertain that patient-centred counselling,

with the weighing up of the pros and cons of undergoing intrauterine/neonatal therapy or a termination, is carried out sensitively. This would facilitate informed decision-making by the affected couple, and limit harm from any disappointing outcomes. There is an enormous economic impact of this complex, biopsychosocial disease burden, of just under UK £10 000.00 per mother–infant dyad [177], besides long-term negative effects on the mother and baby [165,176]. Ongoing studies to prevent/reduce the psychosomatic sequelae of adverse pregnancy outcomes are indicated [178].

Conclusions

Preconceptual physical, mental, and social preparation for a healthy materno–fetal outcome from pregnancy that is within the constraints of a woman's daily lifestyle requires further development. Prevention of psychosomatic disease by health education of teenagers, and young adults or by early detection and treatment of such disorders, would reduce their prevalence during pregnancy. Preventing these clinical conditions by modifying biopsychosocial risk factors could also be addressed when predisposing clinical features are first detected during pregnancy. Health professionals have a duty and the opportunity to educate pregnant women about promoting their health. Using non-pharmacological methods to modify errant behaviour, is a valuable alternative to pharmacotherapy when planning a pregnancy.

A plethora of psychosomatic clinical conditions could manifest through pregnancy to postpartum as singular or comorbid disease entities. These include anxiety disorders and mood symptoms, eating disorders, hyperemesis gravidarum, conversion disorders, schizophrenia, and seizures. Non-pharmacological methods found to be useful are CBT, family therapy, and social network therapy. These therapies can prevent or reduce the impact of these disorders when used either on their own or if combined with psychotropic medication. Complementary methods need further evaluation. Pharmacotherapy has a recognised place in managing perinatal psychosomatic illness. Nevertheless, side-effects for the mother, and any impact on the baby necessitate cautious prescribing. Specialist advice is mandatory for the patient to continue with any previous medication for mental illness, as modifying the dosage to take into account the altered drug metabolism during pregnancy, may be needed. Non-compliance even with tailored care can be worrying when a patient stops treatment without consulting the medical team, as she fears that her baby would be affected by her medication.

There is considerable scope for prevention or early treatment of maternal biopsychosocial symptoms in this relatively young population of pregnant women. Training of health professionals to provide comprehensive patient-centred care should be prioritised. Promoting maternal health by prevention or early treatment of mental illness with its biopsychosocial impact would not only reduce maternal morbidity, and mortality but have other economically beneficial effects. These relate to a positive effect on the health of the baby, the partner, and thus the family. The latest UK report 'Saving Lives Improving Mother's Care' indicates the need for further training to identify, and treat effectively maternal mental illness and psychosomatic disease.

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Chapter 5

Migraine and pregnancy-related hypertension

Chiara Benedetto, Ilaria Castagnoli Gabellari, and Gianni Allais

Introduction

Migraine is a common primary headache disorder affecting about 12% of adults in high-income countries [1]. The worldwide prevalence is not known, yet publications suggest that it does affect women from middle-/low-income countries. It is characterised by severe, disabling headaches, and autonomic nervous system dysfunction. It can be distinguished from tension-type headaches by its unilateral location, its association with pulsation of moderate to severe intensity along with nausea and/or photophobia, and phonophobia, besides being aggravated by routine physical activity [2]. The International Classification of Headache Disorders, 2nd edn. (ICHD-II; International Headache Society, IHS) identifies two major subtypes: *migraine without aura* (MO) and *migraine with aura* (MA). The latter differs from the former by the presence of certain typical symptoms that usually precede or, rarely, accompany the headache, and are referred to as 'aura'. The symptoms of aura include focal neurological symptoms, such as visual symptoms (seeing flickering lights, spots or lines, and loss of vision), or sensory symptoms such as pins and needles and/or numbness [2]. Even if they are defined as clinically distinct entities, MA and MO may coexist in the same patient. Migraine can be associated with hypertensive disorders of pregnancy and could relate to a similar aetiopathogenesis that is generated by mind–body or psychosomatic interaction. As hypertension during pregnancy can result in negative feto–maternal outcomes, the relationship with migraine could be a means of early detection and treatment in order to improve pregnancy outcomes. These interrelationships in disease causation, and their management are discussed.

Impact of migraine on health and social life

Migraine is most common in the age range 25–50 years, which are generally the most productive years of a person's life. Evidence shows that, not only do 'migraineurs' experience a substantial decrease in the ability to carry out everyday tasks in functioning and productivity, but they are also obliged to take a great deal of time away from the workplace [3]. Thus, migraine not only effects the mind and body but also the migraineur's social life. Data from the American Migraine Prevalence and Prevention (AMPP) study show that 35.1% of migraineurs had at least 1 day of headache-related activity restriction over a three-month period [1]. A telephone survey of the general population sample from Germany [4] revealed that, among headache sufferers, 60% reported severe headaches, 30% of which were migraines. Disability because of headaches,

defined as the inability to perform usual activities at work and in everyday life, lasting at least one day, was reported by 16.4% of all headache sufferers. However, the burden of headache was greater in individuals with migraine when compared with those suffering from non-migrainous severe headaches.

Compared with individuals who had non-migrainous severe headaches, twice as many migraine sufferers reported more than 20 headache days during the previous year ($P<0.001$). Disability was three times more frequent in those suffering from migraine, than in those having non-migrainous severe headaches ($P<0.001$). Individuals with migraine rated their general health as being significantly worse than those with non-migrainous severe headache ($P<0.001$). Significantly more migraineurs had consulted a physician ($P<0.001$) more often, and taken analgesics ($P<0.001$) or used prescription medication ($P<0.001$). This would also suggest that migraine is a distinct clinical entity from headaches, and causes a greater morbidity than the latter. Lastly, migraine was three times more common in women than in men ($P<0.001$), and women suffered significantly more often from severe and frequent headaches. Women also reported significantly more disability, and rated their health worse ($P<0.001$) than men [4].

A review on health-related quality-of-life (HRQoL) revealed that migrainous patients reported significantly more sleepiness ($P = 0.007$), less vigour ($P<0.05$), and carried out less activity during the afternoons ($P = 0.018$) and evenings ($P = 0.006$), when compared with patients without migraine. Moreover, less than half of patients suffering from migraine returned to normal functioning between migraine attacks [5]. The findings affirmed that migraine is a disabling condition that leads to a compromised HRQoL. Patients with migraine not only experience diminished HRQoL in comparison with normal, healthy individuals, but also a decreased HRQoL comparable with, or in some cases greater than that experienced by individuals with more serious diseases [3]. Moreover, migraine has a negative impact on work, as well as on social and family life. The inability to carry out normal daily tasks occurs not only during an attack but also during the intervals between attacks. This can be due to the trepidation [3] caused by anticipating when the next attack might start.

Migraine in women

Migraine is one of the most common neurological disorders in adult women [6]. It is estimated to afflict about 18% of women and only 6% of men, with a female/male prevalence ratio of 4:1 [1]. Epidemiological studies suggest that there is very little difference in prevalence between boys and girls before puberty, whereas this trend changes with ageing, increasing greatly in the female population [1,6,7]. According to the AMPP study, the one-year period prevalence in women rises from 6.4% before puberty, to a peak of 24.4% during childbearing years, followed by a dramatic postmenopausal decrease to 5%. Conversely, male migraine prevalence remains stable over the years [1], reaching a peak of 7.4% at about 40 years of age. This marked difference according to gender may be attributable to the influence of different sex hormones, particularly oestrogens, during the reproductive years. The effect of psychosocial circumstances could also have an added influence.

An increasing amount of evidence links migraine to female sex hormones that may affect, not only the frequency, but also the severity and type of migraine attacks. Indeed, several diary card studies have shown an increased risk of migrainous attacks during the perimenstrual period [8–10]. Moreover, approximately 10% of migrainous women have attacks only during menstruation, known as pure menstrual migraine (PMM), while at least 50% of migrainous women suffer from migraine both at menses, and at other times during the menstrual cycle referred to as menstrually related migraine (MRM). The most widely accepted hypothesis on the pathogenesis

of menstrual attacks points to the fall in oestrogen levels during the premenstrual period [11,12]. Another factor supporting the hypothesis regarding the influence of hormones on migraine is the fact that there is a general improvement during pregnancy, and after the menopause, two conditions that are characterised by the absence of hormonal fluctuations [8,13–15]. Conversely, it is reported that, in some cases, the use of hormonal contraception or hormone replacement therapy may even trigger or aggravate migrainous headaches [16].

Migraine in pregnancy

Most epidemiological studies report that migrainous women note a significant, and increasing improvement in their headaches during pregnancy [6], from the first to the third trimester [17]. Sances and colleagues [13] reported that migraine had improved by the third trimester in 87% of the 47 women studied prospectively but their symptoms were likely to persist in the first and third trimesters, if they had MRM. Marcus and co-workers [18] in their prospective study, found that women with headaches that persisted unchanged into the second trimester were less likely to improve thereafter. Improvement during pregnancy in this sample seemed to be more likely if the migraine was MO, and was related to menstruation or when its onset was associated with the menarche [8].

These improvements have been attributed to the absence of hormone fluctuations [19] and/or to the analgesic effects of β-endorphins, which usually increase in pregnancy [6,20]. However, in some women, i.e. those suffering from MA migraine, migraine may worsen during pregnancy [21]. Granella et al. [8], reported worsening of migraine in 4–8% of pregnant women, most of whom had MA. Moreover, a few women experience migraine for the first time during pregnancy [8,22]. A previous study [23] reported that 1.9% of pregnant women developed migrainous symptoms '*de novo*'. A more recent study [24] has qualified this further, by reporting that new onset migraine during pregnancy has a predilection for the third trimester and the puerperium, besides being relatively common (in approximately 5%). While the possibility of a dural tap must be excluded in the puerperium, the presence of other common disorders, such as hypertensive disorders of pregnancy, and anaemia, have to be considered. Again, the possibility of associated serious disorders, such as intracranial hypertension due to venous sinus thrombosis, has to be excluded by carrying out relevant investigations, especially if the headache is associated with other neurological symptoms and signs.

There has been less recognition of the significance of migraine as a materno–fetal risk factor by headache specialists unfamiliar with migraine-related adverse obstetric outcomes. This under-recognition also relates to those obstetricians who underestimate the detrimental effects of migraine on pregnancy outcomes, whether singularly associated with hypertensive disorders or in combination with factors, such as increased maternal age, obesity or diabetes. Nonetheless, specific research that confirms these clinical relationships with migraine in pregnancy [25–27] negate the assumptions of those specialists who are less familiar with the interrelationships so underestimate their significance. Migraine is also reportedly associated with mood disorders, and stress in pregnant populations; these authors [28] advocate a mental along with the physical evaluation of such patients. These would of course specify a mind–body link for such associated symptomatology.

Pregnancy-related hypertension

Approximately 12–22% of all gestations are affected by hypertensive disorders of pregnancy [29]. Although there are several clinical guidelines, the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy provided updated guidelines

[30] on both the classification and management of hypertensive disorders of pregnancy. This was through a combination of evidence-based medicine, and consensus. In this report, *gestational hypertension* (GH) has been defined as a systolic blood pressure of ≥140 mmHg and a diastolic blood pressure of ≥90 mmHg in a woman who was normotensive before 20 weeks' gestation. It is distinguished from pre-eclampsia by the absence of proteinuria. *Pre-eclampsia*, previously known as '*toxaemia*', can be defined as a pregnancy-specific syndrome that occurs after 20 weeks' gestation. It presents as *de novo* hypertension (systolic blood pressure of ≥140 mmHg and/or diastolic blood pressure of ≥90 mmHg) recorded on two occasions, at least 4 hours apart [31], and it is usually accompanied by new-onset proteinuria of ≥300 mg/24 hours. Previous diagnostic criteria of a rise of 30 mmHg in systolic pressure and/or 15 mmHg in diastolic pressure, even when absolute values were <140/90 mmHg, are no longer recommended [30]. Firstly, because they are considered too nonspecific for pre-eclampsia, with under 25% being identified in this manner, and secondly, because such women are not likely to have increased adverse outcome/s [30].

Although the precise incidence of pre-eclampsia is still unknown, it reportedly complicates from 3% to 5% of all pregnancies [29] and remains a leading cause of maternal and perinatal morbidity and mortality worldwide [32,33]. Pre-eclampsia is usually considered severe if one or more of the following criteria are present: a systolic blood pressure of ≥160 mmHg, or a diastolic of ≥110 mmHg on two occasions (within minutes to an hour) while the patient is on bed rest, with/without a 24-hr proteinuria of ≥3 g. Other associated clinical features even in the absence of proteinuria include: oliguria of <500 mL in 24 hours, cerebral or visual disturbances, pulmonary oedema or cyanosis, epigastric or right upper-quadrant pain, impaired liver function, renal insufficiency, thrombocytopenia (<100 000/mL), protein/creatinine ratio ≥0.3, or fetal growth restriction, and reduced amniotic fluid volume [31]. Severe pre-eclampsia can lead to eclampsia, a multisystem disorder with grave consequences for the mother besides fetal consequences of intrauterine growth retardation of <5th centile or reduced/absent umbilical artery end-diastolic flow that could lead to fetal demise. *Eclampsia* is defined as the occurrence of seizures in a woman with pre-eclampsia that cannot be attributed to other causes [30,31]. It requires urgent intensive management, often multidisciplinary.

Even though there is clinical awareness of these hypertensive diseases of pregnancy, globally, and mortality attributable to pre-eclampsia has fallen in developed countries, antenatal surveillance is ongoing in all nations for identification of high-risk women requiring prophylaxis, besides early detection, and management of these disorders. This is due to the risk of significant morbidity from it, not only for the mother but also for the fetus. Fetal effects in this disorder result from persisting maternal hypertension that reduces intrauterine perfusion. This leads to intrauterine growth restriction, and may necessitate urgent preterm delivery of a low birthweight baby particularly when there is an inadequate response to antihypertensives. The developing clinical picture therefore is not encouraging for many mothers, if continuing clinical deterioration is evident with the additional higher risk of perinatal death [31,32]. This requires delivering the baby to obtain individualised optimal outcomes. As the aetiopathogenesis of pre-eclampsia is not clearly understood and the morbidity is high, there remains a continuing need to develop methods for early detection, and better management of those at a higher risk of complications. Its association with migraine may provide such a link.

Table 5.1 shows a clinical vignette of a pregnant woman with migraine, and pre-eclampsia that further illustrates the topic being discussed.

Table 5.1 A clinical vignette illustrates the theoretical discussions.

	Vignette 1: Acute admission of a migraineur with pregnancy: Caucasian ethnicity
Presentation and management	*Mrs LK, a 27-year-old primigravida, was admitted in the afternoon to the High Risk Obstetric Unit at a gestation of 34 weeks and 4 days* ◆ She complained of severe unilateral right-sided headache of throbbing quality associated with intolerance to light; she was feeling sick and had vomited; she had passed small volumes of urine only twice that day; there was numbness on the right side of her face and upper arm; she felt a sensation 'of lights'—an aura; the headache was 'more intense' than her usual migraine ◆ The general examination revealed a tachycardia of 120 and her blood pressure (BP) was 160/110 mmHg; she was alert, and well oriented with generalised oedema; her deep reflexes were normal; she had a proteinuria of two pluses on the dipstick ◆ The obstetric assessment confirmed a pregnancy of 32 weeks with a non-engaged cephalic presentation, a soft, non-tender uterus, and a regularly beating fetal heart; her cervix was closed ◆ A CTG was commenced and relevant investigations were sent off ◆ A second BP check in 15 min was 164/112 mmHg creating a sense of urgency ◆ She had been on oral labetalol, and at this admission was started on parenteral labetalol, and magnesium sulphate ◆ Her laboratory results showed an anaemia with a haemoglobin of 8.4 g/dL, haematocrit levels of 23%, and thrombocytopenia with a platelet count of 12 × 103 mL ◆ Additional laboratory data revealed a serum creatinine level of 0.8 mg/dL, uric acid 11.1 mg/dL, aspartate transaminase (AST) 78 units/L, alanine transaminase (ALT) 60 units/L, lactate dehydrogenase (LDH) 3060 units/L, haptoglobin was undetectable, a normal serum glucose, prothrombin time and partial thromboplastin time was confirmed; deep venous duplex ultrasound of both lower extremities revealed no echoes suggestive of a thrombus ◆ She had been monitored for mild–moderate pre-eclampsia since 34 weeks, when she presented with upper abdominal pain; abdominal ultrasound showed a normal sized liver with normal echotexture; there was no evidence of viral hepatic infection; she had no history of hypertension or diabetes; she had no history of alcohol misuse, and was a non-smoker; there was no family history of venous occlusive diseases (deep venous thrombosis or pulmonary embolism), or of migraine ◆ Until 34 weeks of pregnancy, she had always been normotensive; she was not using any medication but was on micronutrient supplements; migraine episodes with or without aura disappeared during the first, and the second trimester of pregnancy but reappeared during the third trimester ◆ The neurological phenomena of aura were particularly intense in the last two weeks prior to admission ◆ The cardiotocograph showed late decelerations but no uterine contractions ◆ The obstetrician decided on an urgent LSCS; there was approximately 200 mL of amber coloured ascitic fluid in the abdominal cavity; a male infant with Apgar scores of 6 at one min and 8 at five min, was delivered; he weighed 2150 g ◆ On the day after delivery, Mrs LK's blood pressure was 150/90 mmHg; blood tests showed that AST and ALT levels were normalising ◆ After day six postpartum, her vital signs became stable, her symptoms and renal function improved; her liver function test reports returned to normal on day nine ◆ She was discharged from the hospital 12 days after delivery when she had no headaches, and was normotensive

(*continued*)

Table 5.1 Continued

	Vignette 1: Acute admission of a migraineur with pregnancy: Caucasian ethnicity
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ Since the age of 20 years, she needed to take specific drugs, such as triptans, as symptomatic treatment with oral analgesics did not relieve her MA ◆ Further assessment of initiating/maintaining psychosocial factors of her migrainous attacks would require childhood/teenage biopsychosocial history; this however was unavailable
Impact on the healthcare system	◆ Closer surveillance antenatally because of Mrs LK's history of migraine led to early detection of her severe pre-eclampsia, which prompted timely caesarean delivery
Implication for training	◆ A clinically satisfactory materno–fetal outcome had been obtained due to awareness of the risks of hypertensive disorders of pregnancy being associated with migraine (MA), particularly in the third trimester; detailed early history may have helped in identifying what made her more prone to migraine, and hypertension during her pregnancy
What did this form of management prevent?	◆ Closer antenatal care with early intervention prevented psychosomatic sequelae due to adverse pregnancy outcomes, although further postpartum details were unavailable to evaluate her health, and future health care planning
Could anything further have been done?	◆ Perhaps closer psychosomatic surveillance and a more detailed biopsychosocial history since childhood may have helped assessment and the earlier introduction of measures to prevent migraine, and hypertensive disorders during pregnancy.

Learning points

The obstetrician ought to consider migraine as an adjunctive risk factor during pregnancy from the very first antenatal visit. If headache is complained of it is advisable that further diagnostic investigation are carried out. Should migraine be confirmed, then a close surveillance of the patient for pre-eclampsia, is necessary throughout pregnancy. One should be alert to a rapid deterioration in the clinical condition due to progressive pre-eclampsia in a migraine sufferer.

Common pathogenetic aspects of migraine and pre-eclampsia

Various hypothesis have been put forward to explain the possibility of there being some kind of pathogenetic link between migraine and pre-eclampsia. These include (see Fig. 5.1):

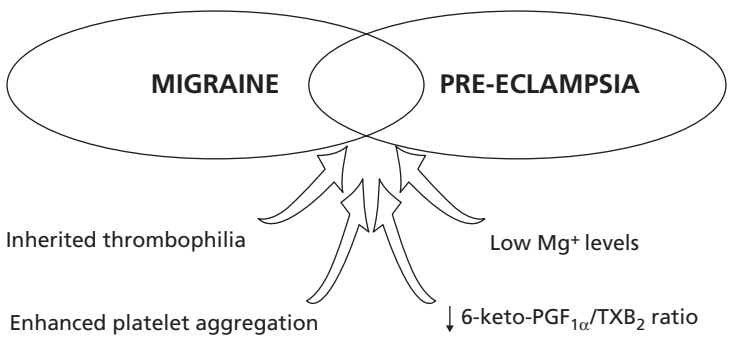

Figure 5.1 Common biological associations of migraine and pre-eclampsia.

1. *An eicosanoid imbalance with a shift in favour of thromboxane A_2 (TXA_2)*: The plasma level of 6-keto-$PGF_1\alpha$, a vasodilating agent, was found to be significantly decreased in both women with pre-eclampsia and in those with eclampsia, compared with a control group of normotensive pregnant women ($P<0.05$). A significant increase in the level of TXA_2, a vasoconstrictive agent, was observed ($P<0.01$). Thus, there was a lower 6-keto-$PGF_1\alpha$/TXB_2 ratio in the pre-eclamptic and eclamptic groups of women (1.50 and 1.30, respectively), than in the normotensive women (4.99), which was significant ($P<0.001$) [34]. Similarly, evidence has demonstrated that prostaglandins also play a role in the pathogenesis of migraine [35]. Lower 6-keto-$PGF_1\alpha$ levels are observed in patients with migraine than in controls [36,37], as observed with PMM. It has also been demonstrated that patients with PMM have significantly lower 6-keto-$PGF_1\alpha$ concentrations than do healthy women throughout the menstrual cycle [38,39]. Unlike 6-keto-$PGF_1\alpha$, TXB_2 levels do not differ significantly in PMM, either under basal conditions, or during migrainous attacks, although they do fluctuate throughout the menstrual cycle. Consequently, the 6-keto-$PGF_1\alpha$/TXB_2 ratio is lower in PMM sufferers than in non-migraineurs [39,40].
2. *Enhanced platelet aggregation*: The imbalance in the eicosanoids with an excess of TXA_2 leads to the activation of platelets and the clotting system, and this is related to both migraine, and pre-eclampsia. Two meta-analysis have confirmed both the efficacy and safety of antiplatelet agents in the prevention of pre-eclampsia [41,42]. The first study reviewed 59 trials and found a 17% reduction in the risk of pre-eclampsia associated with the use of antiplatelet agents. The reduction in absolute pre-eclampsia risk was more evident, with a significant difference in high risk women, compared with those with a moderate risk [41]. The second meta-analysis reviewed 31 trials and concluded that the use of antiplatelet agents (aspirin at a daily dose of 50–150 mg) was associated with a 10% reduction in the relative risk of both pre-eclampsia ($P = 0.004$), and preterm birth before 34 weeks' gestation ($P = 0.011$), with both being statistically significant when compared with controls [42]. There was no beneficial effect of aspirin in a dose over 75 mg/day.

In relation to the association of migraine to treatment with aspirin during pregnancy, there have been reservations in conducting research, as clinical trials during pregnancy raise ethical concerns. Therefore, multicentre trials about migraine prophylaxis with aspirin have included the non-pregnant women, or only males. Two major multicentre trials reported the efficacy of aspirin in migraine prophylaxis outwith pregnancy. Of these, the 'British Physician Trials' demonstrated that a daily administration of aspirin reduced the frequency of migraine by an average of 30% [43], while the 'Physician Health Study' [44], a double blind trial of low-dose aspirin (325 mg every other day) on US male physicians ($n = 22\,071$), reported a 20% reduction in the frequency of headaches. A small open trial [45] compared the efficacy of aspirin (13.5 mg/kg) with propranolol (1.8 mg/kg), and reported that both drugs were equally effective in reducing the frequency, duration and intensity of the migraine attacks. The latter, however, could have fetal effects such as intrauterine growth restriction or hypoglycaemia and bradycardia, so has not been recommended for migraine prophylaxis during pregnancy. Hence, aspirin has been preferably used for migraine prophylaxis.

3. *Inherited thrombophilia*: It has been hypothesised that a state of hypercoagulability is able to decrease placental perfusion through the production of microthrombi in the placental circulation [46]. The subsequent placental release of various circulating factors, mediators of maternal endothelial activation, and/or dysfunction, in response to ischaemia, could lead to the development of hypertension [47]. Lin and August [48], in a meta-analysis, investigated the association between genetic thrombophilic conditions and pre-eclampsia. The results demonstrated that only the factor V Leiden (FVL) polymorphism (1692 G-A) conferred an increased risk

for pre-eclampsia, with an odds ratio (OR) of 1.81 (95% CI, 1.14–2.87). Nevertheless, if only cases of severe pre-eclampsia were considered, the OR increased to 2.24 (95% CI, 1.28–3.94). Neither methylenetetrahydrofolate reductase (MTHFR) homozygosity (677 C-T), nor prothrombin polymorphism (20210 G-A) showed a significant association with pre-eclampsia. These authors advocated further investigation to determine whether the prothrombin G20210 polymorphism is associated with the development of severe pre-eclampsia. Their meta-analysis would have been underpowered to detect this difference [48]. A subsequent case–control study on pregnant women (n = 1616) showed that those with severe pre-eclampsia (n = 406) had a higher risk (OR 4.9; 95% CI, 3.5–6) of being carriers of either an inherited, or acquired thrombophilic factor [49], namely: OR 5.2 (2.9–9.8) for FVL polymorphism; OR 6.0 (2.7–14.1) for prothrombin polymorphism; and OR 4.1 (2.1–4.2) for MTHFR polymorphism. In women with mild pre-eclampsia (n = 402), only prothrombin and homozygous MTHFR mutations were significantly more prevalent than in controls [49], with an OR of 3.3 (1.1–10.3) and 2.6 (2.3–5.5), respectively.

As to the association between inherited thrombophilia and migraine, three studies [50–52] found a higher prevalence of FVL in patients with MO migraine, compared with healthy controls, while d'Amico et al. [51] found a significant association. The MTHFR 677TT and 1298CC genotypes are over-represented in migraine patients compared with controls [53]. This datum is still under debate. Indeed, Oterino et al. [54] found that the presence of 677TT for migraine in general was 12%, for MO it was 9%, and MA it was 18%; this did not differ significantly from the 13% that was found in healthy controls. However, the difference was statistically significant [54] when the TT frequency in migraine with and without aura were compared. Moreover, in Caucasians, stratification by migraine subtype indicates that the association between the C677T variant and migraine is specifically attributed to MA [55].

4. *Low magnesium levels*: Magnesium (Mg+) is an essential element involved in vascular function and plasma membrane stability. Mg+ modulates transmembrane transport of calcium (Ca2+), sodium and potassium, regulates contractile proteins, and influences DNA and protein synthesis. Moreover, at an intercellular level, it acts as a Ca2+ antagonist, thereby modulating the vasoconstrictive action of Ca2+. It also influences endothelial function, thereby altering responses to vasoconstricting and vasodilating agents. Lastly, the influence that Mg+ has on neural function could also impact on blood pressure regulation through an inhibition of norepinephrine release from nerve endings that leads to a decrease in blood pressure [56].

It has been demonstrated that there is a reduction of intracellular Mg+ during an attack of migraine in the cerebral cortex of migrainous patients [57,58]. Mg+ plays a role in the modulation of vascular function, and its deficiency may account, at least in part, for the pathogenesis of both pre-eclampsia and migraine. Moreover, a common therapeutic strategy is pursued in the use of magnesium sulphate, or Mg+ supplementation, for pre-eclampsia [59] and migraine [60], respectively.

Migraine and pregnancy-related hypertension

A correlation between migraine and pregnancy-related hypertension was hypothesised as early as 1959 [61]. Several studies have investigated the clinical association between migraine and hypertensive disorders of pregnancy. A positive association between headaches and GH and/or pre-eclampsia was reported in ten studies [61–70], while it was not demonstrated [71,72] in two others. However, all but one of the studies [70] were retrospective and in most cases, the diagnosis of migraine was not made according to the IHS criteria for primary headaches [73]. Neither were the criteria for the diagnosis of pre-eclampsia homogeneous (see Table 5.2 for more details).

Table 5.2 Select studies examining the relationship between migraine and pre-eclampsia

Author (Year)	Study design; sample size	Definition of migraine	Definition of pre-eclampsia	Results
Rotton et al. (1959) [61]	Retrospective, cross-sectional; 221 women with migraine/ 88 women with eclampsia	At least 3 of the following: family history, pre-headache aura, hemicranial distribution, amelioration with vasoconstrictor drugs, associated nausea/vomiting	At least 2 of the following: significant hypertension, albuminuria, oedema	21.4% of migrainous women developed 'toxaemia' and 17% of eclamptic women were migrainous
Wainscott et al. (1978) [71]	Retrospective, case–control; 450 women with migraine, 136 controls	All cases were selected from a migraine clinic	Self-reported toxaemia	18% of women in both groups reported 'toxaemia'
Moore and Redman (1983) [62]	Retrospective, case–control; 24 women with severe PE, 48 controls	Severe headache accompanied by nausea, vomiting, or visual disturbances	Increase in systolic and diastolic blood pressure by at least 30 and 15 mmHg, respectively; maximum antenatal systolic and diastolic pressure ≥140 and 90 mmHg, respectively; persistent proteinuria (≥1 g/L, or ≥1g/24 hours, or 2+ on Albustix)	33% of cases and 6% of controls reported migraine ($P<0.01$)
Marcoux et al. (1992) [63]	Retrospective, case–control; 172 women with PE, 254 women with GH, 505 controls	Severe headache accompanied by vomiting, prodromal/concurrent visual disturbances, or both	Elevation of diastolic blood pressure to ≥90 mmHg after 20 weeks of pregnancy; significant proteinuria (≥300 mg on one 24-h urine collection or ≥1 g/L on 2 urine specimens at least 4 hours apart)	Adj OR 2.44 [95% CI 1.42–4.20] for PE; Adj OR 1.70 [95% CI, 1.02–2.85] for GH
Chen and Leviton (1994) [64]	Retrospective, cohort; 484 women with history of migraine before pregnancy	Ad-Hoc Committee Classification of Headache criteria (1962) [73]	Systolic blood pressure of 140 mmHg or a rise of ≥30 mmHg over and above the usual level on at least 2 occasions, at least 6 hours apart; diastolic blood pressure of 90 mmHg or a rise of 15 mmHg over and above the usual level on at least 2 occasions, at least 6 hours apart; proteinuria of 'significant degree' on ≥2 successive days, or persistent oedema of hands and face	21% of women with pre-existing migraine developed PE
Chang et al. (1999) [65]	Retrospective, case–control; 291 women with stroke, 736 controls	Self-reported history of simple or classical migraine, according to the Headache Classification Committee criteria of the IHS (1988) [74]	Self-reported	21% of migrainous women (cases and controls) reported a history of high blood pressure in pregnancy compared with 11% of non-migrainous women ($P<0.05$)

(*Continued*)

Table 5.2 Continued

Author (Year)	Study design; sample size	Definition of migraine	Definition of pre-eclampsia	Results
Mattson (2003) [72]	Retrospective, cross-sectional; 728 women	Structured interview based on slightly modified Headache Classification Committee criteria of the IHS (1988) [74]	Self-reported	Age-adj OR 1.26 [95% CI, 0.78–1.99] for GH and migraine without aura; Age-adj OR 0.97 [95% CI, 0.38–2.13] for GH and migraine with aura
Scher et al. (2005) [66]	Retrospective, case–control; 482 women with migraine, 2517 controls	International Classification of Headache Disorders, 2nd edn. criteria of IHS (2004) [2]	Self-reported	Adj OR 1.63 [95% CI 1.2–2.1] for GH
Facchinetti et al. (2005) [67]	Retrospective, case–control; 75 women with PE, 75 controls	Structured questionnaire based on the Headache Classification Committee criteria of the IHS (1988) [74]	Diastolic blood pressure >90 mmHg on 2 consecutive measurements within 4 hours, proteinuria >300 mg in a 24-h urine collection (Report of NHBPEPWG criteria 2000)	38.7% of cases and 10.7% of controls reported a history of migraine, OR 4.95 [95% CI, 2.47–9.92] for migraine
Adeney et al. (2005) [68]	Retrospective, case–control; 244 women with PE, 470 controls	Self-reported physician diagnosis	Blood pressure levels of at least 140/90 mmHg lasting >6 hours, or a persistent 15 mmHg diastolic rise, or 30 mmHg rise in systolic blood pressure after the first trimester; proteinuria ≥30 mg/dL (or 1+ on a urine dipstick) on at least 2 occasions, 6 hours or more apart (ACOG criteria 1996)	Adj OR 1.8 [95% CI, 1.1–2.7] for migraine
Bánhidy et al. (2007) [69]	Retrospective, case–control; 713 women with migraine, 37 438 without migraine	International Classification of Headache Disorders, 2nd edn. criteria of IHS (2004) [2]	Pregnancy hypertension, oedema, proteinuria, and extreme weight gain (details of the study methods were described in another paper by the same authors)	Prevalence OR 1.4 [95% CI, 1.1–1.8] for PE
Facchinetti et al. (2009) [70]	Prospective, cohort; 702 normotensive women with single pregnancy at 11–16 weeks' gestation	Structured interview based on the International Classification of Headache Disorders, 2nd edn. criteria of IHS (2004) [2]	Blood pressure ≥140/90 mmHg after 20 weeks' gestation, measured at least twice and at least 6 hours apart; proteinuria ≥300 mg in a 24-h urine collection	Adj OR of developing hypertensive disorders of pregnancy 2.85 [95% CI, 1.40–5.81] for migrainous women

Rotton and colleagues [61], reviewed pregnancy outcomes in 284 migrainous women, and paid particular attention to the appearance of pre-eclampsia. Pre-eclampsia was diagnosed if at least two of the following criteria were present: significant hypertension, albuminuria or oedema, and as eclampsia, if the documentation of convulsions, or autopsy confirmation were added to the diagnostic criteria for pre-eclampsia. A total of 25.4% cases were diagnosed in 221 patients with pregnancies that carried over into the third trimester. These included 17.2% with pre-eclampsia and 8.2% with eclampsia. After having excluded any unconfirmed cases, the authors reported an incidence of acute toxaemia of 21.4%. They concluded, that toxaemia in migrainous pregnant women, when compared with the general population, was more frequent than would be expected by chance, with a much higher incidence of convulsions. Additionally, a review of 88 documented cases of eclampsia showed an incidence of migraine in at least 17%, again, higher than expected [61]. Interestingly, a large number of women whose migrainous symptoms worsened during pregnancy, also became toxaemic later on in pregnancy [61].

A subsequent retrospective study [62] compared 24 women with severe pre-eclampsia with 48 randomly selected controls. The diagnostic criteria for pre-eclampsia were: an increase in systolic and diastolic blood pressures by at least 30 and 15 mmHg, respectively, over the antenatal baseline systolic blood pressure of ≥140 mmHg and diastolic blood pressure of 90 mmHg, besides persistent proteinuria of ≥1 g/L or ≥3 g/24 hours. A history of headache before pregnancy was significantly more common in the pre-eclampsia group (54% vs 17%, $P<0.001$) than in the control group. Moreover, it was mainly of the migrainous type, as 33% of women with pre-eclampsia, and 6% of the control group ($P<0.01$), described headaches accompanied by nausea, vomiting, or visual disturbances.

The first study, specifically designed to assess the relationship between a history of migraine before pregnancy, and the risk of pregnancy-induced hypertension, was conducted by Marcoux et al. in 1992 [63]. A total of 172 women with pre-eclampsia, defined as an elevation of diastolic blood pressure to ≥90 mmHg after 20 weeks of pregnancy, associated with proteinuria of ≥300 mg in a 24-h urine sample or ≥1 g/L in two specimens of urine at least four hours apart, and 254 women with GH were interviewed postpartum, and compared with 505 controls. Migraine, confirmed postpartum, was defined as at least one attack of a severe headache accompanied by vomiting, prodromal/concurrent visual symptoms, or both, in the year before pregnancy; it was reported by 16% of the pre-eclamptic women, 12% of women with GH, and 8% of the controls. The adjusted ORs were 2.44 (95% CI, 1.42–4.20) for pre-eclampsia and 1.70 (95% CI, 1.02–2.85) for GH. The authors [63] also reported that the average frequency of the migrainous attacks was directly correlated to an increased risk of pre-eclampsia (P value for trend = 0.01). Women suffering from migraine once or more in a month presented an OR of 2.39 (95% CI, 1.21–4.71). A similar trend was also noted with regard to the duration of the migrainous attacks for pre-eclampsia (P value for trend = 0.009). A duration of pre-eclampsia of more than 12 hours presented an OR of 2.48 (95% CI, 1.24–4.94).

An analysis by Chen and Leviton of prospective data on 55 000 pregnancies from the National Collaborative Perinatal Project [64] identified 484 women with a history of migraine before pregnancy, diagnosed according to the Ad-Hoc Committee Classification of Headache, of 1962 [73]. A total of 21% of them developed pre-eclampsia and it was more frequent in women with headaches that showed no improvement. However, their 'mild pre-eclampsia' category also included those who had clinical pictures that were characteristic of GH rather than pre-eclampsia.

In a large case–control study, designed to examine the relationship between migraine (diagnosed according to the IHS criteria) [74] and stroke in young women, Chang and co-workers recruited 291 women with stroke and 736 hospital-based controls [65]. It was found that both groups of women, whether they had a stroke (27%), or were controls (16.7%) and had a history of migraine, were more likely ($P<0.05$) to give a history of raised blood pressure without a specific time of onset during the pregnancy, compared with women who did not have migraine.

The Genetic Epidemiology of Migraine Study, aimed to compare the prevalence of classical risk factors for cardiovascular disease in 863 migraineurs, compared with 5135 controls [66] without lifetime migraine. Assessment of both migraine status and cardiovascular risk was carried out by a self-administered standard questionnaire mailed to the participants. The results showed that women with migraine, diagnosed according to the IHS criteria [2], were significantly more likely to report a history of GH, irrespective of migraine subtype, after adjustment for age, socioeconomic status, smoking and alcohol, with an OR of 1.63 (95% CI, 1.2–2.1).

Another case–control study [67] was carried out between 2000 and 2002 to evaluate the association between headache and pre-eclampsia. A total of 75 women, who delivered at an average gestational age of 34 weeks, and had pre-eclampsia according to IHS criteria [2], and parity-matched controls at an average gestational age of 39 weeks at delivery, were retrospectively identified by reviewing clinical records. They were then interviewed about their headache history through a structured ad-hoc questionnaire, based on the 1988 IHS criteria for primary headache [74]. Headache was significantly more prevalent in the pre-eclampsia group than in the control group (62.7% vs 25.4%), with an OR of 4.95 (95% CI, 2.47–9.92). The greater prevalence was particularly evident in MO (36% vs 10.7%), while episodic tension-type headache was equally distributed. Headache was significantly more prevalent in patients with severe (75%), as opposed to moderate (38.8%) pre-eclampsia, with an OR of 5.63 (95% CI, 1.97–16.03).

Similarly, a case–control study conducted by Adeney and colleagues [68] identified 244 women with pre-eclampsia, diagnosed on the basis of the American College of Obstetricians and Gynecologist (ACOG) guidelines [75], and 470 normotensive women as controls. The results showed that women with a self-reported history of a diagnosis of migraine had an 80% increased risk of pre-eclampsia (adjusted OR 1.8, 95% CI, 1.1–2.7). Moreover, on stratifying according to maternal age at migraine diagnosis, they observed a linear trend in the association between increasing maternal age at migraine diagnosis, and the risk of pre-eclampsia (adjusted P for linear trend = 0.03). The same risk increased to 12-fold in overweight (pre-pregnancy BMI ≥25 kg/m^2) migrainous women (95% CI, 5.9–25.7).

Bánhidy et al. [69] revised a population-based large dataset of newborn infants without congenital abnormalities, with a view to evaluating pregnancy complications in mothers with migraine during pregnancy. The cases were selected from the National Birth Registry of the Central Statistical Office for the HCCSCA (Hungarian Case–Control Surveillance of Congenital Abnormalities). Migraine was diagnosed prospectively through prenatal care logbooks along with other relevant medical records, or retrospectively, by a structured questionnaire completed by the mothers. The researchers detected 713 women with migraine and compared them with 37 438 women without migraine. Pregnant women with migraine had a higher prevalence of pre-eclampsia compared with controls (11.4% vs 8.4%) with a prevalence OR of 1.4 (95% CI, 1.1–1.8). The proportion of preterm births and low birthweight infants was higher in migrainous women, although this did not reach significance.

Facchinetti and colleagues [70] performed the first prospective, cohort study that aimed to evaluate whether migrainous women, diagnosed according to the IHS criteria [2], are at a higher risk of developing hypertensive disorders during pregnancy than those who do not suffer from migraine. They enrolled a total of 702 normotensive women and reported that 38.5% were migrainous. The results showed that the risk of developing either GH, or pre-eclampsia was higher in migraineurs (9.1%) than in non-migraineurs (3.1%), with an adjusted OR of 2.85 (95% CI, 1.40–5.81). Women with migraine also showed a trend towards an increased risk of bearing infants of low birthweight (OR 1.97, 95% CI, 0.98–3.98).

Vignette 2 shows a clinical scenario where the pregnant woman suffered from MO even prior to her pregnancy, and developed severe pre-eclampsia in the third trimester. Her progressively deteriorating clinical condition necessitated delivery, thereby illustrating the complexity of such presenting symptoms, and their urgent management (Table 5.3).

Table 5.3 Vignette 2: Acute admission of a migraineur with pregnancy: Caucasian ethnicity

	Vignette 2. illustrating a multipara with migraine and PIH
Presentation and management	*Mrs RM, a 37-year-old gravida 5, para 1, with a previous termination and two miscarriages, was admitted to the High Risk Obstetric Unit at a gestation of 35 weeks and 2 days* ◆ Mrs RM complained of severe headache without aura, along with pruritus, malaise, uterine contractions, and decreased fetal movements; she always experienced migraine during pregnancies, even if the frequency of migrainous attacks was reduced to about 50%; accordingly, migraines were 'nothing new' to her, with onset being at 12 years of age ◆ She did not complain of cough, chest pain, nausea, vomiting, visual changes, abdominal pain, or vaginal bleeding ◆ Early in this pregnancy, Doppler studies showed bilateral uterine arterial notching so she was commenced on aspirin to be continued until 32 weeks' gestation ◆ She had chronic, mild migraine without aura that presented at 2–3 month-intervals; the headaches occurred particularly at night or very early in the morning; they were 'throbbing' in nature and localised to the right suboccipital, periorbital, and temporal regions; each episode lasted 2 hours when treated with medication ◆ She had treated her migraine with non-steroidal anti-inflammatory drugs (NSAIDs), and other drug combinations such as acetaminophen with codeine ◆ When she experienced severe migraine during this pregnancy, she had taken the maximum prescribed amount of codeine permitted in pregnancy at 1000 mg/day for a total of 7000 mg/week; she had measured her blood pressure during the migrainous attacks as instructed, and the findings confirmed her as normotensive ◆ The general examination at admission revealed obesity (BMI of 37), pulse of 94, BP of 160/110 mmHg; she was well-oriented; her deep reflexes were normal; she had a proteinuria of three pluses on the dipstick ◆ The obstetric assessment confirmed a neat abdomen with a fundal height of 33 cm, a cephalic presentation, and mild, uterine contractions every 5 min; she had a regularly beating fetal heart at a rate of 130; her cervix was 3 cm dilated and 80% effaced, with the head at –2 cm; a CTG was commenced; relevant investigations were sent off ◆ Neurological examinations in the past 15 months were unremarkable; special tests (computed axial tomography, X-rays, and electroencephalograms) in the past 15 years were also unremarkable ◆ BP checks continued for the next 45 min, with the BP ranging between 160–167/105–115 mmHg ◆ Parenteral antihypertensives along with magnesium sulfate was started as per protocol for the prevention of eclamptic seizures ◆ Laboratory testing revealed a haemoglobin level of 14 g/dL, a low platelet count of 11×103/mL, and abnormal liver function tests with an AST of 75 U/L, ALT of 80 U/L, and lactate dehydrogenase (LDH) at 514 U/L; the plasma creatinine was 0.89 mg/dL, albumin 4.0 g/dL, total bilirubin 0.5 mg/dL, and the uric acid level 4.0 mg/dL; coagulation studies were normal ◆ The clinical picture was consistent with a diagnosis of severe pre-eclampsia, which was not responding to the management given ◆ An emergency caesarean was carried out 1 hour after the treatment was started; a female infant with Apgar scores of 9 at one min and 9 at 5 min was delivered; the baby weighed 2210 g ◆ After delivery Mrs RM's clinical condition remained stable with mild pre-eclampsia ◆ During the following days she became normotensive; she continued to complain of daily migrainous attacks; the pain was of mild intensity, and disappeared in two hours with a single dose of acetaminophen of 500 mg ◆ She was discharged from the hospital 10 days after delivery when she was normotensive, and asymptomatic

(*continued*)

Table 5.3 Continued

	Vignette 2. illustrating a multipara with migraine and PIH
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ Since the age of 12 years, she needed to take analgesics such as NSAIDs for her MO ◆ Other therapies prepregnancy that included osteopathy, physical therapy, and massage were unsuccessful in treating her migraines, or had disappointing results, which disheartened her, thus increasing her vulnerability to psychosomatic distress ◆ A more detailed history of childhood/teenage years may have facilitated assessment
Impact on the healthcare system	◆ Early detection of pre-eclampsia was facilitated by closer antenatal surveillance due to the occurrence of regular migrainous attacks even though she had been normotensive until 35 weeks
Implication for training	◆ A clinically satisfactory materno–fetal outcome had been obtained due to awareness of the risk of pre-eclampsia being associated with migraine, particularly in the third trimester; urgent management of severe pre-eclampsia and delivery was apt
What did this form of management prevent?	◆ The early recognition of migraine, and its association with a severe form of pre-eclampsia along with immediate attention to managing severe pre-eclampsia prevented rapid progression to eclampsia with a worse materno–fetal prognosis
Could anything further have been done?	◆ Closer psychosomatic surveillance and a more detailed biopsychosocial history since childhood may have helped in prevention/reduction of migraine, and associated childbearing sequelae

Learning points

As with Vignette 2, the obstetrician ought to consider migraine as a marker for pre-eclampsia, especially in the third trimester, thereby promoting early detection, and urgent delivery.

Two studies reported no association between migraine and medical complications such as hypertensive disorders of pregnancy. Of these, Wainscott et al. [71], did not note any significant difference in pregnancy outcomes between 450 women with migraine and 136 non-migrainous women. The incidence of self-reported pre-eclampsia (undefined) was 18% in both groups. In the second study, Mattson [72] reported no significant age-adjusted lifetime risk of migraine, MA or MO, being associated with pregnancy complications, such as self-reported swollen feet, arterial hypertension, and proteinuria. Perhaps, the varying biopsychosocial associations of the different samples studied, and the different research methodologies used, could explain the contrary findings of these studies investigating the association of migraine with pre-eclampsia, and reaching diverse conclusions, compared with the other studies that have been discussed.

Although, more often than not, pregnancy is a time of relative well-being for migrainous women, as their headaches usually improve, they may be more exposed to some clinical risks such as hypertension [76] or a thromboembolic event [77]. There are further reports of associations of migraine and hypertension during pregnancy with psychosomatic problems [78–80], as mentioned before [28]. One of these publications in the recent literature [78] reports of a probable association of psychosocial factors such as stress and violence with migraine, and hypertension during pregnancy. Lack of sleep [79] also increases the risk of migraine, and hypertensive disorders of pregnancy. Migraineurs who were overweight or obese [80], had a 6.10-fold increased odds of pre-eclampsia (95% CI, 3.83–9.75) as compared with lean non-migraineurs. In a more recent study [81], a shorter threshold for investigations of migraine/pre-eclampsia was advised if a patient presented with onset of headaches when pregnant, as this increased her risk of hypertension, and seizures.

It is also evident that the collection of data during the anamnesis of a pregnant patient must take into consideration, not only pathologies traditionally considered as high risk factors, such as diabetes or thrombophilic status, but also the presence of headache should be given importance as a risk factor. Again, the HRQoL is not only reduced by migraine [82] but also by pre-eclampsia, which can also be associated with a stroke [83] in a few patients; all these conditions share certain pathogenetic aspects. Therefore, should the pregnant woman report symptoms of headaches, then further diagnostic investigations after due evaluation of the past history, and clinical findings should be carried out to determine the presence/absence of migraine; this could alert the clinician to the increased risk of more serious associated disorders.

Conclusions

In short, migraine is one of the most common neurological disorders in women of reproductive age. Although it tends to improve during pregnancy, it can get worse, particularly in the third trimester and postpartum. Migraine can be associated with pre-eclampsia, which is still a leading cause of maternal and perinatal morbidity, and mortality. Although the primary mechanisms of both migraine and pre-eclampsia are poorly understood, they do share some common pathogenetic aspects. The majority of published studies suggest a close association between migraine and hypertensive disorders of pregnancy, particularly pre-eclampsia. The two clinical scenarios highlight these problematic encounters of clinicians with patients who have migraine, and associated pre-eclampsia.

Albeit the major part of the published literature suggests a close relationship between migraine and pregnancy-related hypertension, further clarification of these complex psychosomatic issues is needed. Obstetricians face these clinical scenarios associated with pre-eclampsia in everyday patient care, and are obligated to aim to reduce the physical, mental, and social morbidity of both the mother and her infant. Could migraine be used as a predictor of pre-eclampsia and eclampsia? Recent studies indicate that both headache specialists and obstetricians should pay particular attention to these patients. Therefore, it is essential that prospective studies be carried out using more robust research methods on larger samples to determine the actual extent of the morbidity posed by migraine with pre-eclampsia. It is the authors' opinion, that until such times as further data have been obtained on this question, the wisest line of action when facing a pregnant patient with migraine is to consider it as a marker for the more severe hypertensive disorders, and to dedicate multidisciplinary care to promote her health from her very first visit in seeking antenatal care.

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Chapter 6

Disease severity, pain, and patient perception: themes in clinical practice and research

Mira Lal and Johannes Bitzer

Introduction

The severity of any symptom and pain in particular, is difficult to appraise objectively, for these are essentially subjective elements, which depend on the patient's perception of her symptoms. Assessing what is subjective in an objective manner by an individual who cannot actually perceive the extent of the distress caused by the disease, is one of the greatest challenges of clinical practice and research. Only the sufferer experiencing the symptom can gauge its intensity to near accuracy, and take the decision to seek help for the reduction of its severity, and its cure. The patient is the best person to decide whether any treatment provided has been beneficial in reducing the severity of her symptoms or to judge when to stop treatment. During the major part of the last century, comparatively less attention was paid to evaluating the patient's perception of the severity of her symptoms. In recent years however, there is greater recognition of the premise that including the patient's perspective when gauging the severity of disease would facilitate the provision of patient-centred, economically sound, healthcare. Consumer demand and market forces have channellised this shift in outlook, with health providers being obliged to promote the judicious usage of finite healthcare resources. This chapter focuses on disease severity related to certain benign gynaecological comorbid conditions.

Gynaecological comorbidity requiring a psychosomatic approach

The gynaecological diagnoses and management of certain conditions, such as pelvic floor/perineal dysfunction, infertility/subfertility, miscarriage, stillbirth, premature menopause, and pelvic pain, are based on conclusions drawn from the study of manifestations of both physical and psychosocial ill-health. These diagnoses can be referred to as 'gynaecological comorbidity' [1], and are recognised clinical entities in the field of psychosomatic gynaecology [2,3]. Among these gynaecological comorbid conditions, the management of infertility/subfertility using methods based on mind–body interaction was introduced in the 1980s, and this form of management has been able to reduce associated stress with a resultant improvement in outcomes reflected as higher rates of conception and successful pregnancies [4–6]. First, the psychosomatic aspect of pelvic/perineal dysfunction pertaining to disease severity is discussed. This is followed by deliberations on the emotional pain/trauma of infertility/subfertility, pregnancy loss, premature menopause,

and then the complex conundrum of pelvic pain. Lastly, there is a focus on endometriosis, which is known to be associated with these clinical conditions, yet its aetiopathogenesis remains unclear.

Postpartum pelvic floor/perineal dysfunction and disease severity

Pelvic floor/perineal dysfunction, hitherto referred to as 'pelvic/perineal dysfunction', relates to symptoms resulting from the loss of the anatomical/functional integrity of the pelvic diaphragm and perineum [7,8]. The pelvic/perineum comprises of myofascial structures, which support the pelvic organs and facilitate normal urogenital functioning. These structures are innervated by segments L3–5, S2–5 of the spinal cord with the nerve supply being carried to the muscles by short branches arising directly from the spinal segments, and also via the levator ani nerve (S3–5) and the pudendal nerve (S2–5). Derangement of the nerve supply or injury to the muscles and ligaments of the pelvic floor or perineum can lead to the symptoms of pelvic/perineal dysfunction.

These symptoms comprise stress (urinary) incontinence, anal incontinence, dyspareunia, prolapse, and haemorrhoids [8]. Bladder and bowel continence is a voluntarily acquired, socially appropriate behaviour. It is learnt through a process of conditioning during childhood. Therefore, the loss of continence can impair psychosocial health. A severe biopsychosocial impact occurs in many who suffer from incontinence and its consequences.

To date, there is only one English language publication that has included all relevant physical symptoms [9] and measured their impact on mental health. This general population survey by MacLennan et al. investigated participants by interviewing one member from each family who in addition answered questions on behalf of the rest of the family members. The enquiry had female (n = 1546) and male (n = 1464) respondents (mean age: 44.5 years). The incidence of postpartum pelvic floor symptoms in female participants was reported as urinary incontinence in 35%, faecal incontinence in 3.5%, flatal incontinence in 10.9%, prolapse in 8.8%, dyspareunia in 3.9%, vaginal laxity in 5.2%, and haemorrhoids in 30.2%. The severity of incontinence was assessed by documenting pad usage. The psychological impact of pelvic/perineal symptoms was evaluated by using the short form of the SF36 questionnaire. Women with incontinence or prolapse had significantly lower summary physical and mental denomination scores than the healthy population mean, whereas women with haemorrhoids had a lower physical score only. All these symptoms, other than prolapse, were also investigated by Lal [8] using face-to-face domiciliary interviewing. The participants preferred to be evaluated at home rather than at the hospital where they had delivered. This investigation [8] was more comprehensive than the former [9] having categorised maternal perception of pelvic/perineal dysfunction, and its impact on physical, psychological, and social health. Symptoms were studied using a biopsychosocial assessment tool specifically devised for the study. The enquiry incorporated elements from six other relevant disciplines [8], in addition to obstetrics and gynaecology, to enable the estimation of different patterns of biopsychosocial morbidity among the study participants. This gave a broader perspective to the understanding of symptoms of pelvic/perineal dysfunction.

Other reports from investigations of pelvic/perineal dysfunction have included fewer of these pelvic floor symptoms. Most researchers have published on the frequencies of incontinence or symptoms of sexual dysfunction. The distress generated by the sufferer's perception of symptom severity has not been sufficiently addressed. While the severity of incontinence as measured by perineal protection for urinary loss was reported by a few, the perceived misery generated by such symptoms was not recognised. It remains clinically important to evaluate the relationship of incontinence and sexual symptoms with psychosocial health, as this impacts on overall well-being and health-seeking behaviour. Early studies had recognised [10–19] that the physical effects

of vaginal delivery, whether assisted or not [20,21], may cause pudendal neuropathy or lead to direct muscular injury. This resulted in third- or fourth-degree perineal tears that presented as incontinence [22] and dyspareunia [23–27]. Most publications on postpartum incontinence did not implicate the caesarean mode. Proponents [28] promoted elective caesarean as prophylaxis for pelvic/perineal dysfunction. Nonetheless, vaginal delivery was favoured [29] by beneficence-based judgement. Further reports [30,31] have concluded that incontinence does not necessarily follow anal sphincter tears. Later studies also reported on post-caesarean incontinence [32]. Incidentally, incontinence can be manifest in those who have never been pregnant [33] or are teenage gravidas [34]. Primiparae have been considered to be at higher risk [35]. Therefore, a significant proportion of the suffering population belongs to a younger age group. Yet, the overall biopsychosocial implications of the illness on incontinent sufferers, and any impact on their social roles [36], have not been evaluated comprehensively. Thus, the magnitude of the illness is largely unknown [37].

In a review [38] of urinary incontinence in gynaecological samples, Sinclair and Ramsay commented that publications about bladder problems and their treatment have focused on objective assessments, notably urodynamic parameters, to evaluate the amount of 'bother' that a sufferer experiences. These authors observed that what the sufferer feels about her symptoms is of greater clinical significance, as is the impact of the incontinence on her life, and the lives of those around her [38].

Two other publications [39,40] on urinary incontinence concluded that, there is no accurate method of assessing severity from these physical symptoms, when excluding the patient's perspective. Of these studies, Herbison and colleagues [39] sought research ideas from community dwelling women with stress and urge urinary incontinence, who served as citizens' juries (n = 14 in each category). The researchers aimed to determine which outcomes were likely to help sufferers. The participants stressed that quality-of-life was the most important outcome that they wanted researched. They were dismissive of the research outcomes for measuring incontinence pervasive at the time, such as the pad test and bladder diaries, which had been widely promoted. These women felt that frequency and the amount of urinary leakage, if used as measures of distress due to incontinence, were subsidiary outcomes. They reasoned that, what was 'a little bit' to one person was 'a lot' to another, as it was related to differing perceptions about the same problem by each incontinent sufferer. This thereby attests to the need for a patient-centred perspective in providing continence care. These participants [39] also suggested that ways had to be found to make help-seeking easier for the urinary incontinent. This would enable the benefits of relevant treatment to reach the 'silent suffering majority'.

A concurrent publication by Ternent et al. [40] aimed to identify issues that were of importance to women with stress urinary incontinence and to identify additional outcomes that ought to be addressed in future research. The authors reported that much of the published literature on stress incontinence focused on clinical outcomes that were selected by doctors. This had little relevance to the perceived suffering of the incontinent patient. They stressed that the social and personal impact of the incontinence is of greater significance to the incontinent patient. In their investigation, a prospective questionnaire was sent to 188 community dwelling women (mean age: 57 years), who were suffering from stress urinary incontinence. The participants emphasised that the current methods for measuring outcomes have not addressed what the patient perceives about the severity of her disease. They concluded that relevant research should be prioritised. These researchers had developed a patient generated index (PGI), which was found to capture the concerns of the sufferer but this did not map well with the EuroQuol-5D (EQ-5D with five dimensions), or correlate well with the nine domains of the condition-specific Kings Health Questionnaire (KHQ). Both these measures were introduced in the last century to assess the

impact of urinary incontinence on the quality-of-life of these sufferers, but they have been found to be lacking in the assessment of symptom severity. Therefore, they are not widely applicable in clinical practice; nor are they useful for those looking for a fresh outlook in assessing severity through unbiased research.

Even though symptomatic pelvic/perineal dysfunction commonly presents as incontinence [8,41], or as sexual dysfunction, and impacts on lifestyles, these issues need further research. It has been reported that sexual dysfunction as part of pelvic/perineal symptomatology can directly manifest as dyspareunia or as vaginal laxity [41]. It can also be a consequence of the effect of urinary or anal incontinence on sexuality [42]. Yet, studies on the impact of these symptoms on relationships, are sparse. Whether the pain of dyspareunia is similar to other types of physical pain, and consequently is to be dealt with in a similar fashion, or whether it is an aberration of one's sexual experience, and therefore requires a different approach, is unclear [42,43]. Thus, its impact on sexual satisfaction is capricious [8], and cannot be explained by a dose–response connection, as believed by some. Health professionals with such beliefs have advised couples to lessen the pain of dyspareunia by increasing the frequency of intercourse. This seems contrary, and can exacerbate the problem but has been proposed, nevertheless, by proponents who are unfamiliar with the complex aetiopathogenesis of dyspareunia. If the misconceived dose–response connection is accepted by an investigator as being explanatory for dyspareunia, it can lead to undervaluing of other mechanisms that can contribute to its intricate aetiopathogenesis. This would then introduce bias in the investigation and subsequent management of dyspareunia, with an increase in patient dissatisfaction. Similarly, if translated into recommendations for the management of impaired sexual health, an approach based on a dose–response link would be self-defeating, and detract from satisfactory outcomes. It would also discount the majority of causative factors that can lead to dyspareunia.

Few earlier studies of pelvic floor symptoms [44–46] have related disease severity to the need for perineal protection using pads worn by incontinent mothers. This would however not be applicable for assessing incontinence where the mother perceives her symptoms as not being severe, despite her need for perineal protection. Nor would it be suitable for the evaluation of other pelvic/perineal symptoms unrelated to incontinence of urine or faeces. The physical effects of postpartum incontinence, particularly faecal, can be severe enough to have a detrimental effect on postpartum psychosocial health. This has defied quantification when measures such as usage of pads, have been solely applied as a measure of the severity of incontinence. Postpartum dyspareunia would similarly impact on psychosocial and general sexual health, as it is closely associated with emotional and relationship issues, but has been difficult to quantify. Notwithstanding, the severity of postpartum pelvic/perineal dysfunction, including its impact on psychosocial health, has received inadequate attention in research [39,40]. This under-recognition has persisted, despite the fact that the effect of symptoms, if judged as severe by the incontinent, can be devastating [8,47]. Even mild stress incontinence can be a nuisance to some sufferers but one can often live with it, for it is neither life-threatening nor noticeable to the public eye. Even so, increased awareness by health professionals of maternal help-seeking behaviour, guided by the mother's perception of the severity of her symptoms, would help develop appropriate support.

Maternal reticence in disclosing these health problems [37,39,48], along with the stigma associated with puerperal mental disorders, has discouraged sufferers from coming forward to seek help. There is a prevalent false notion in certain societies that every mother performs well at childbirth. Hence, it is considered as very unusual if one differs from the generations of mothers who have apparently experienced childbirth happily [8]. Those mothers who do have problems are thus compelled to be reticent about their symptoms. They fear being ostracised due to associated social stigma. Over the years, developing tools to facilitate the detection of the silent biopsychosocial

morbidity of severe postpartum incontinence, and sexual ill-health has been gaining research interest. The issues need further elucidation, as these symptoms continue to cause maternal morbidity that is often silent.

The sufferer's perception of the severity of the symptoms of incontinence and dyspareunia is not only related to her physical symptoms but also to the direct impact of such symptoms upon her psychosocial [49,50] and general sexual health [51]. Severity defined in this manner has a wider connotation that makes it apt for addressing the severity of faecal and stress incontinence, flatal incontinence and dyspareunia. An added advantage for evaluating the latter two symptoms is that they do not present as objectively measurable physical manifestations but as social impediments [8]. Therefore, any impairment of biopsychosocial health, expressed as both physical and emotional pain, reflects disease severity for these presenting symptoms. This approach to defining severity would have implications for women after confinement and may be evident during the transitional period of complex emotional changes [52] with long-lasting memories, particularly, after the first childbirth [53–55]. Maternal perception of the severity of her pelvic/perineal symptoms can also be influenced by her feelings about her childbirth experience and her baby.

Therefore, in Lal's study [8], severity was assessed by categorising the sufferer's biopsychosocial perception of urinary, faecal and flatal incontinence, dyspareunia, and haemorrhoids. To enable comparison with previous reports, the type and pattern of perineal protection worn was recorded. This would function as an objective measure of the severity of urinary and faecal incontinence in the sample studied. Moreover, to address another existing gap in the literature, an instrument was developed to quantify maternal perception of the biopsychosocial severity of her symptoms. This instrument was able to evaluate the severity of disease comprehensively by using a tailored, patient-centred approach.

Due to the complex physical and emotional changes of childbearing, postal surveys or a closed format of questioning with restricted options can only partially reveal the full extent of any biopsychosocial morbidity [56] from symptoms of pelvic/perineal dysfunction. Additionally, at the start of Lal's study, the pilot face-to-face interviewing enabled clarification of any issues pertaining to the questioning, such as the interviewees' understanding of the medical term 'urgency'. Thus, the accuracy of responses was ascertained. Moreover, the trust of participants was further gained by reassurances regarding the maintenance of confidentiality and anonymisation of the data. There was a 85% response rate, and all interviews undertaken were completed. Appropriate statistical analyses of the data collected using descriptive, univariate, and multivariable (backward elimination stepwise logistic regression modelling), gave coherent results. The findings [8] revealed conclusively that pelvic floor symptoms were not uncommon [50,51] in the post-caesarean patient, including the elective (planned) caesarean, or in those who delivered by non-instrumental vaginal delivery (NVD) without sustaining third- or fourth-degree tears. Pelvic floor symptoms had significant associations with obstetric/biological predictors, both previously reported and those identified for the first time during this investigation. The association with impaired psychological and social health for every mode included in this study was another new finding. These modes had been considered as being non-/less-traumatic to the pelvic floor, and proponents were proposing elective caesarean as a prophylaxis for postpartum pelvic floor disorders. When caesarean versus vaginally delivered were compared, stress incontinence was prevalent in 26/80 (33%) elective, 34/104 (33%) emergency, vs 54 (54%) vaginally delivered; anal (faecal and flatal) incontinence was manifest in 42/80 (53%) elective, 52/104 (50%) emergency vs 44/100 (44%) vaginally delivered; and dyspareunia in 22/80 (53%) elective, 28/104 (50%) emergency vs 46/100 (46%) vaginally delivered. Double incontinence (stress and anal) was present in 69 (23% caesarean, 26% NVD) mothers, whereas double incontinence with dyspareunia was manifest in 33 (11% caesarean, 12% NVD) mothers. Multiple concomitant symptoms caused greater anguish in the patient

[56]. This resulted in severe biopsychosocial morbidity. New faecal incontinence (starting after delivery) necessitated continuous pad usage in two mothers after pre-labour elective caesarean [57] and in one mother who delivered vaginally. Moreover, when judged by evaluating associated maternal psychosocial symptoms, the impact of the physical manifestations could be severe, irrespective of the delivery mode.

After coding the psychological data collected [8], it was found that dysphoria, the state of having dysphoric symptoms (anxiety with depression), was the most common psychological manifestation. It was categorised as 'levels of dysphoria' to facilitate evaluation of the severity of anxiety and mood symptoms, which were identified in this dataset. Mild–moderate dysphoria was not significantly associated with the symptoms of pelvic/perineal dysfunction but severe dysphoria (anhedonia/low mood with >3 mood symptoms) was linked to it. Severe dysphoria was associated with incontinence ($P = 0.038$, OR 2.334, CI 1.049, 5.192) and dyspareunia ($P = 0.005$, OR 2.231, CI 1.272, 3.914). The methodology used in this study also enabled assessment of dysphoria as a continuum with pre-clinical and clinical stages; these would need different forms of management according to the severity, ranging from prevention of depression by psychotherapy to medication.

For assessing social health, the particular maternal social activity that was interfered with due to the physical manifestations of pelvic/perineal dysfunction thereby delaying its postpartum resumption, was included in the evaluation of the mother's perception of the severity of her symptoms. A total of 11 (6%) post-caesarean, and five (5%) vaginally delivered mothers ruled out another pregnancy due to the biopsychosocial impairment following their childbirth [50,51]. Table 6.1 depicts the associations between dysphoria, and impaired social health with the physical manifestations of pelvic/perineal dysfunction.

In summary [50,51], the findings confirmed that leisure activities were interfered with in mothers who had post-caesarean stress incontinence, and social networking in those with post-caesarean anal incontinence. Interference with resuming employment was significantly associated with post-caesarean anal incontinence, and in the vaginally delivered with postpartum stress incontinence. Resuming a sexual relationship was significantly impaired in mothers with postpartum

Table 6.1 Psychosocial associations of symptomatic pelvic/perineal dysfunction

Groups for analysis	Severe dysphoria (*P* value)	LA (*P* value)	SN (*P* value)	Employment (*P* value)	Sexual relationship (*P* value)
All participants	Dyspareunia (0.005)	Postpartum SI (0.036)	CS mode (0.018)	Postpartum SI (0.023), CS mode (0.031)	Postpartum AI (0.049), Wound problems (0.076)
Overall CS	Postpartum SI (0.038)	Postpartum SI (0.039)	Postpartum AI (0.084)	Postpartum AI (0.077)	NS
Elective CS	Wound problems (0.022)	Postpartum SI (0.104)	Postpartum AI (NS)	NS	Dyspareunia (0.072)
Emergency CS	Postpartum SI (0.051)	Postpartum SI (0.034)	Postpartum AI (NS)	Postpartum AI (0.090)	Postpartum AI (NS)
NVD	Postpartum SI (0.028), intact perineum (0.082)	NS	NS	Postpartum SI (0.003)	Wound problems (0.049)

CS, caesarean section; NVD, non-instrumental vaginal delivery; LA, leisure activities; SN, social networking; SI, stress incontinence; AI, anal incontinence; NS, non-significant.

anal incontinence, and in the vaginally delivered with wound problems. These findings reveal a certain pattern of associations of pelvic/perineal dysfunction with psychosocial ill-health, which appear symptom specific. Perception of symptom severity was particularly relevant when a mother had multiple symptoms of the same disorder [56] as for example, anal incontinence with urgency or both flatal and faecal incontinence. Again, multiple symptoms of different compartments could occur, e.g. stress urinary with faecal incontinence or a pelvic floor symptom with perineal trauma. Under such circumstances, the patient's perception of severity of her symptoms, and her judgement in ascribing it to a specific disorder took up greater significance [56]. Thus, an individual's response gained importance, even though statistical significance was not reached. Patient-centred care is needed for these individuals, and the local healthcare provision needs to take this into account. Table 6.2 below illustrates this.

Clinical vignettes 1 and 2 depict pelvic-perineal dysfunction causing considerable maternal biopsychosocial morbidity.

Table 6.2 Clinical vignettes showing the complexities of biopsychosocial morbidity resulting from pelvic/perineal dysfunction after an elective caesarean, and a spontaneous vaginal delivery.

	Vignette 1: Elective caesarean: post-caesarean incontinence and dysphoria: British Caucasian	**Vignette 2: Spontaneous vaginal delivery: perineal trauma with incontinence, dyspareunia, and dysphoria: British Caucasian**
Presentation and management	*Mrs BS, a 34-year-old married, 2nd gravida, who measured 165 cm in height and weighed 80 kg, had booked early for antenatal care* ◆ She sought frequent consultations for being nauseous up to 20 weeks' gestation, and for her worries as she had a previous spontaneous miscarriage ◆ On examination at 32 weeks, a fetus growing at the 60th centile, presenting as breech with a normal liquor volume was confirmed, and the relevant investigations were evaluated, which suggested no contraindication to an external cephalic version (ECV) ◆ After a hospital consultation, Mrs BS agreed to undergo an ECV, and the relevant literature was provided ◆ At 35 weeks' gestation she attended the hospital for the planned ECV ◆ On the day she arrived, she complained of occasional urinary incontinence, seemed confused, and when the risks were discussed again prior to the ECV procedure, she changed her mind, and opted for the alternative option, i.e. to undergo a caesarean	*Ms IY, a 26-year-old primigravid, saleswoman, who measured 155 cm in height and weighed 60 kg, had booked early for antenatal care* ◆ An ultrasound scan confirmed an active singleton, results of routine investigations were normal and her blood group was A+ ◆ She had a normal pregnancy, and she stopped work at 32 weeks when her rings were tight and ankles swollen ◆ Slight pedal oedema persisted but she remained normotensive with no proteinuria, and continued with routine antenatal care ◆ At 39 weeks' gestation, examination by her midwife (MW) revealed a head three-fifths palpable abdominally, and she accepted a sweeping of membranes ◆ Two days later, she was admitted in the early hours to the labour ward with irregular labour pains and a BP of 139/90 but no proteinuria ◆ She was considered to be in the latent phase of labour with initial CTG monitoring showing a normal trace, and she continued mobilising ◆ She had been a low risk pregnancy and had planned a water-birth ◆ She did not want pain relief at admission but her contractions became regular and she sought pain relief—an opioid injection ◆ She seemed more settled after this

(*continued*)

Table 6.2 Continued

	Vignette 1: Elective caesarean: post-caesarean incontinence and dysphoria: British Caucasian	Vignette 2: Spontaneous vaginal delivery: perineal trauma with incontinence, dyspareunia, and dysphoria: British Caucasian
	◆ She continued to attend for antenatal care, and attempted other positions, which were suggested by the community midwife (MW), and a friend who also reiterated that these positions would enable the fetal presentation to change to cephalic 'naturally' ◆ However, the fetus remained as breech and at 38 weeks after routine preoperative assessment, an elective caesarean was carried out; a baby weighing 3700 g was delivered by breech extraction with forceps-assisted delivery of the after-coming head (circumference 39 cm) ◆ The uterine incision extended at the left angle, and while suturing the uterus additional uterotonics had to be given to stem a brisk blood loss that suggested moderate postpartum haemorrhage ◆ Immediately post-delivery her observations confirmed a tachycardia and an infusion of uterotonics along with a blood transfusion was commenced ◆ After her observations stabilised she was transferred to the postnatal ward for routine postoperative care ◆ She wanted to go home on the 2nd day but her wound was 'weeping' ◆ This was investigated and antibiotics were commenced along with oral iron, and she was discharged on the 4th postpartum day ◆ After a week at home she noted occasional faecal incontinence, which needed perineal protection, besides occasional urgency, and this along with her urinary incontinence made her miserable	◆ Early labour was confirmed and she rested intermittently that night ◆ The next day her contractions were strong and she entered the bath as planned with intermittent monitoring ◆ She experienced progressively stronger contractions, was 6 cm dilated with the baby in an OP position and the head was palpable abdominally ◆ Her membranes ruptured, draining old meconium stained liquor ◆ She had to come out of the bath and have continuous CTG monitoring ◆ She accepted the change in management hesitantly but her pain increased so she sought pain relief ◆ The opioid given did not relieve her pain and an epidural was requested ◆ The epidural provided patchy pain relief even after re-siting ◆ She became more distressed at 7 cm dilation, with an LOP position ◆ Entonox inhalation did not ease the pain ◆ At the next examination, her contractions were petering off, she had ketonuria, and was 8 cm dilated with a LOT position ◆ After an epidural top-up oxytocin infusion was started to get her contractions stronger and frequent ◆ An examination confirmed good contractions with the head not palpable abdominally, a cervical dilation of 9 cm, the head as LOA, just above the spines ◆ After two hours, she wanted to push, was fully dilated, the head was 1 cm below the spines, with caput, moulding, and a likely OA position ◆ Active pushing was commenced, the head was visible when she pushed suddenly with great effort to deliver

Table 6.2 Continued

	Vignette 1: Elective caesarean: post-caesarean incontinence and dysphoria: British Caucasian	Vignette 2: Spontaneous vaginal delivery: perineal trauma with incontinence, dyspareunia, and dysphoria: British Caucasian
	◆ She was extremely embarrassed about her incontinence, and started sleeping separately from her husband ◆ She felt low even at 8 weeks, and her sexual relationship suffered ◆ She could not relax because of the incontinence, and had not bonded with her baby ◆ Mrs BS felt that she was coping aptly with the urinary incontinence but the faecal incontinence, and urgency, caused her to be 'irritable, short tempered, weepy, run down, very low, frumpy and unconfident' ◆ Her health carers did not understand her misery even at 6 months after delivery by attributing the incontinence-related distress to being 'hormonal', which needed no treatment ◆ All this had put a strain on her relationship with her partner, and her anxiety had increased ◆ She went to a homeopath who thought that her mood was low, and started her on relevant homeopathic medication ◆ She had decided not to consult her GP again but her persisting double incontinence made her return to her GP to seek referral to a tertiary (university) hospital	◆ The swift delivery prevented guarding of the perineum and caused lacerations ◆ The baby weighed 3388 g ◆ The MW was inexperienced in suturing so requested the obstetrician to suture ◆ The obstetrician confirmed a second-degree tear extending to the anal margin with first-degree labial and paraurethral tears ◆ After completing the suturing advice about perineal care was given ◆ Ms IY had urinary incontinence after the catheter was removed, which she blamed on her delivery but her incontinence had started with her pregnancy ◆ She had wanted to breast-feed but could not manage, and felt a failure ◆ She complained of low mood after 10 days of delivery; her district MW called it 'baby blues' and assured recovery ◆ At 6 weeks her perineal wound had healed but there was soreness and occasional flatal incontinence ◆ She carried out pelvic floor exercises, and recovered from flatal incontinence at 6 months but not stress incontinence ◆ The incontinence interfered with vigorous exercise/swimming or travelling, so it was inconvenient professionally/personally ◆ She said 'I am grumpy, tearful for no reason, cannot concentrate, and the smallest of things makes me cry …'; she refused to sit near her partner ◆ Her GP started her on antidepressants ◆ After 6 months she came off medication but after 5 weeks was low ◆ The GP started counselling her as she 'was heading for a divorce'

(*continued*)

Table 6.2 Continued

	Vignette 1: Elective caesarean: post-caesarean incontinence and dysphoria: British Caucasian	**Vignette 2: Spontaneous vaginal delivery: perineal trauma with incontinence, dyspareunia, and dysphoria: British Caucasian**
Psychosocial initiating and maintaining factors	◆ She met her developmental milestones during childhood and adolescence ◆ Mrs BS had been an easy-going adult with no major health problems ◆ Although she had felt devastated after her previous miscarriage she had recovered after a year ◆ Being pregnant again brought back her anxiety/fear of pregnancy failure ◆ She developed infection of the caesarean wound, which healed on antibiotics but she remained dissatisfied because of the incontinence ◆ Her unsatisfactory delivery experience brought back dysphoria so she could not enjoy motherhood ◆ Her relationship suffered because of her incontinence, which also led to dyspareunia ◆ She consulted her MW and her GP but was frustrated with their lack of understanding of dysphoria and hence, sought homeopathic care ◆ Her persisting incontinence made her return to her GP for a referral	◆ Ms IY had been healthy during her childhood and adolescence, and excelled in sport ◆ When she was pregnant she had wanted a water-birth but was disappointed when it was contraindicated during her labour ◆ This increased her anxiety, and lowered her pain threshold so she had an epidural for pain relief but it missed segments, and the pain intensified with oxytocin augmentation ◆ The perineal trauma with incontinence increased her disappointment, and she felt low ◆ Lack of empathy at her place of work about her childcare needs increased her stress ◆ She had dyspareunia at her partner's first attempt, and felt he did not understand ◆ The antidepressants followed by counselling helped with some of her biopsychosocial problems ◆ She thought of changing her place of work because of her incontinence-related biopsychosocial problems after her normal vaginal delivery
Impact on the healthcare system and probable explanation for her behaviour	◆ Her background since childhood gave her a positive outlook towards her pregnancy but an unexpected, unsatisfactory outcome compromised her happiness, and protracted healthcare was sought ◆ Her anxiety and depression after a previous pregnancy loss resurfaced ◆ Additional costs for health and social care services would continue as she recovered from a disappointing childbirth outcome	◆ Counselling by her GP would continue ◆ She would avail of the services of secondary healthcare providers for treating her incontinence, if not cured in 6 months, as it interfered greatly with her roles as mother, wife, and sales representative ◆ The health service would have to bear these additional costs due to her extreme dissatisfaction with her delivery outcome; previously she had considered herself as healthy
Implications for training	◆ Recognising what is significant for the patient from a group of presenting symptoms is an art to be developed in clinical care. A patient-centred psychosomatic approach to pelvic floor dysfunction promotes it	◆ Her GP was aware of her mood symptoms and their management, so was able to diagnose, and treat her illness; this provided relief from her biopsychosocial symptoms that were generated by her perception of a negative pregnancy outcome

Table 6.2 Continued

	Vignette 1: Elective caesarean: post-caesarean incontinence and dysphoria: British Caucasian	**Vignette 2: Spontaneous vaginal delivery: perineal trauma with incontinence, dyspareunia, and dysphoria: British Caucasian**
Was this form of management appropriate and what did it prevent?	◆ The management given was apt for the initial physical care, including antibiotics prescribed for wound problems. Wound disruption was prevented but the impact of the biopsychosocial issues pervaded Mrs BS's response. Attention to these issues prevented psychosomatic repercussions	◆ The comprehensive management was appropriate for her physical and mental symptoms along with a social impact. The GP's intervention prevented Ms IY experiencing severe depression and going through a divorce because of her extremely unsatisfactory birth experience that had been very traumatic to her
Could anything further have been done?	◆ Biopsychosocial issues could have been dealt with earlier if recognised using a psychosomatic approach, and giving attention to all aspects concurrently	◆ Further antenatal dialogue may have prepared her for the ever-changing picture in labour that interfered with her plans; this may have limited her sense of failure after her delivery
Other forms of presentations and behaviour	Other presentations of postpartum pelvic/perineal dysfunction may include, different strata of biopsychosocial needs that may impact on infant-bonding with its future repercussions on child development, an impaired relationship with one's partner, and manifestations of severe dysphoria that could be expressed as psychosis, self-harm and post-traumatic stress disorder with both short and long-term implications, including avoiding another pregnancy.	

Learning points

In both vignettes shown in Table 6.2, the impact of unsatisfactory pregnancy outcomes, due to pelvic floor symptoms, and the resulting impaired psychosocial health were presented. These patients can remain a burden for the health services if not given appropriate attention. Mrs BS and Ms IY may have benefited from an earlier intervention using a psychosomatic approach. They did not meet a health professional with psychosomatic awareness at their primary healthcare facility.

In the management of postpartum pelvic/perineal dysfunction, methods to evaluate symptoms, and reduce their severity will potentially remain a matter of concern and controversy [58]. Universal promotion of elective caesarean section as a means of reducing the angst arising from postpartum pelvic/perineal dysfunction, especially if severe, has not been supported by robust scientific evidence [59]. This includes an evaluation of the cost-effectiveness of delivery modes by either elective (planned) caesarean or vaginal delivery [60]. The premise that severe biopsychosocial morbidity due to pelvic/perineal dysfunction can arise following any mode of delivery [50,51] is also supported by reports from other studies with diverse methodologies [61,62]; urgency was included in Lal's study but had been missed by previous studies [63]. Its detection could be used to plan measures to prevent anal incontinence, as it represents partial tears of the external anal sphincter. Further exploration [64,65] is needed regarding preventive measures to reduce incontinence, for symptoms can present at an earlier age—even in the nulliparous adolescent [34]. If untreated, biopsychosocial morbidity can be life-long. These publications [8,34] exonerate pregnancy and labour as being the sole causative factors for postpartum incontinence, and dyspareunia. Notwithstanding, clinical practice to prevent pelvic/perineal injury in labour

[66], and the resultant morbidity, should be prioritised. The application of preventive measures tailored to diverse populations also needs scrutiny. Differing obstetric practices, even in the same geographical area [66], can initiate, exacerbate, or maintain pelvic/perineal symptomatology with biopsychosocial consequences. Symptoms of pelvic/perineal dysfunction will continue to be part of the clinical workload in the foreseeable future. Methods to appraise its severity should include assessment using a psychosomatic approach.

Emotional pain: infertility and pregnancy loss

The concept of emotional pain is not new to mankind (see Chapter 1). It was considered part of ancient beliefs regarding health and welfare among indigenous populations. Nonetheless, it has not been popular as a theme in Western medicine, where it is under-recognised [67], although it has retained a significant place in Eastern medical thinking. Emotional pain can affect a person as severely as physical pain [68], and can be associated with the latter. It remains invisible to the naked eye and thus elusive to those who do not recognise its subtle presence or its role in the psychosomatic manifestations affecting various organ systems. This is particularly relevant to the cardiovascular, nervous, locomotor, and alimentary systems. Aspects of emotional pain, related to infertility, miscarriage, and stillbirth, all of which can lead to adverse psychosomatic health outcomes, are discussed next.

Infertility

Infertility can be defined as the inability to conceive, despite regular unprotected intercourse for 1–2 years with the duration being reduced where fecundity, i.e. the capacity to produce offspring, is lower, as in the ageing female [69,70]. *Subfertility* refers to being less than normally fertile. The use of the term 'infertility' has been contentious, despite its wide usage, for it also alludes to being 'sterile' or never being able to conceive, whereas if the terminology is used in a more liberal fashion as is current, it also refers to a woman being unable to bear a child within a certain time frame [71]. The terminology is also extended to include those who conceive but are unable to continue with a pregnancy that results in a live-birth. Those who have never conceived are considered as having primary infertility, whereas those who cannot conceive after having given birth to a live-born, are categorised as having secondary infertility. As with certain complex medical problems, infertility is a unique issue requiring the careful medical evaluation of two individuals separately, as well as jointly, because of their interactions with each other in reaching a successful pregnancy outcome.

Biopsychosocial factors are closely involved in childbearing. However, biological factors have usually been given greater priority when investigating infertility in couples. Relevant investigations of these physical factors have indicated that in about 40%, the main cause of the couple's infertility is related to the male partner, and that in another 40%, the female partner is implicated. Furthermore, in about 20% the couple are held responsible, while in about 3–4% of couples, no cause for their infertility is evident; the latter being referred to as 'unexplained infertility' [72]. Frequencies of the causes can vary with the characteristics of the sample being studied. As the investigations used routinely for evaluating infertility are targeted at physical factors, the psychosocial aspect is missed, other than in a few select healthcare facilities, where its significance is recognised. It is known that stress and lifestyle factors can effect fertility in both females, and males [73]. Anxiety torments the infertile couple, when they keep on trying to conceive naturally but have been unsuccessful in the past. Low mood manifests concomitantly in many during the management of infertility, especially when pregnancies fail. This can increase stress and thus, its detrimental effects on conception and pregnancy, via the hypothalamic–pituitary–adrenal (HPA) axis. Consequently, psychosocial factors deserve parity along with the physical, in order to improve pregnancy outcomes in the infertile.

The main physical factors implicated in female infertility are ovulatory problems in 20%, tubal problems in 20%, endometriosis in 10%, and cervical factors in 5%. Usually the patient seeking treatment for infertility is given a physical examination after her medical history is taken. Pertinent investigations carried out to gauge the extent of the problem include: examining triple pelvic swabs to rule out bacterial/viral infections; appraising specific haematological/endocrinological tests; and relevant imaging studies. When the woman is ovulating normally, and there is no endocrinological imbalance or structural anomaly, her partner then undergoes assessments contemporaneously. If investigations confirm abnormal results, and further treatment is indicated, this is commenced prior to the joint evaluations of the couple's reproductive capacity. The prevalent plans for investigations do not emphasise the role of the higher brain centres on ovulation through a psychosomatic interaction. This can start an endocrinological cascade, which can compromise fertility, and the embedding of the fertilised ovum. Therefore, effective management of infertility can be impeded by routinely ignoring the psychosomatic factors that can affect fertility.

Among other aetiopathological factors that can result in female infertility, are agenesis of reproductive organs or absent ovaries. These are often associated with chromosomal anomalies. There could be anomalies of the reproductive organs if the woman has been exposed to external toxins, hormones, and teratogenic medication when she was developing *in utero*. Ovulatory problems usually stem from dysfunction of the HPA axis. This can present as menstrual problems, such as oligomenorrhoea, or amenorrhoea that can compromise fertility. There can be chronic anovulatory infertility due to the polycystic ovary syndrome [72], which is a relatively common disorder. Tubal problems can arise from inflammation or infection usually due to pelvic inflammatory disease. These could affect ovum transport and fertilisation, or increase the risk of an ectopic pregnancy. The integrity of the cervix including its secretions could have been compromised by trauma during a previous surgical procedure or due to pelvic infection. This may affect sperm motility and fertilisation. Endometriosis, a disease in which endometrial tissue is present outside the uterine cavity, can affect fertilisation or embedding of the fertilised ovum. Benign tumours such as fibroids could affect implantation of the zygote, with deleterious effects on a future pregnancy. Malignant tumours, such as ovarian teratomas, could similarly impair fertility. Conflicting reports about the occurrence of spontaneous miscarriage/congenital anomaly [74] or ectopic pregnancy in pregnant workers exposed to waste anaesthetic gases in theatres suggest limiting such exposure; incriminatory evidence of this is, however, lacking. Greater importance should also be given to the effect of emotional factors on fertility. They can interfere with ovulation, and subsequently diminish the chances of fertilisation [71]. Moreover, certain oral contraceptives can compromise ovarian reserve [75], thereby leading to infertility, and this deserves further study.

As regards the physical factors related to male infertility [72], it is widely known that it can be caused by aberrations of those features of the sperm/semen, which are considered as normal parameters. To check for these characteristics when investigating male infertility, semen analysis is carried out and four basic characteristics of the semen are usually evaluated microscopically. A sperm count is undertaken which refers to the number of sperms present in a semen sample; a count of >20 million in 1 millilitre (mL) of semen is considered as normal. An individual with only 5–20 million sperms/mL of semen is considered as subfertile, and if there are <5 million sperms/mL of semen, he is considered as infertile. Sperm are also examined to ascertain whether most have a normal morphology, and whether they can swim (sperm motility). Not all sperm within a specimen of semen will fulfil the criteria that categorise them as being normal. Some may be immature, and others may have abnormalities of the head or tail. A normal semen sample contains no more than 25% of abnormal forms of sperm. The volume of the semen sample is also an important criterion, as an abnormal amount of semen can affect the sperm's ability to successfully fertilise the ovum. A further test is to assess the ability of the sperm to penetrate the outer coat

of a guinea pig's ovum; the result is taken into account in predicting the ability of the concerned individual's sperm to penetrate a human ovum.

A great number of conditions can result in the findings of a semen analysis being abnormal with the potential for future biopsychosocial problems when the individual decides to start a family but his fertile partner fails to conceive. Conditions in which fertility can be impaired are as follows: men born with testicles that have not descended from the abdominal cavity into the scrotal sac (cryptorchidism), which, if not corrected in infancy, can lead to heat damage of the testes or to malignancy in later life; a man can be born with only one testicle (monorchidism), or the testicular size can be smaller than normal; past infections, such as mumps, can affect testicular function, as can a past injury; the number of sperms can be reduced if normally descended testicles are exposed to high temperatures, often due to occupational requirements, as for example, working close to a furnace; if one has abnormally large testicular veins, as in men with varicoceles. Being exposed to various toxins, including pesticides, regular use of recreational drugs, excessive alcohol intake, diabetes, suffering from thyroid problems or other endocrinological disturbances, or taking anabolic steroids and harmful medications, can all lead to defective spermatogenesis. Congenital anomalies affecting the male anatomy can result in sperm being ejaculated into the bladder, rather than through the urethra. Scarring from past infections can also directly interfere with ejaculation.

Treatment of male infertility includes first addressing any known *reversible factors*. These include: discontinuing any medication known to have an adverse effect on spermatogenesis or ejaculation, decreasing excessive alcohol intake, and treating endocrinological diseases. Testosterone given in low doses can improve sperm motility in clinical situations where this impedes fertilisation. Varicoceles need to be treated surgically. The effect of stress on the HPA axis can affect the function of Sertoli cells in the testes [76], and lead to azoospermia that may be permanent. The effect of psychosocial factors on male infertility has received little attention in research or in clinical practice.

Treatments to overcome *physical factors* that cause male infertility include, segregation of the most motile sperm from semen samples, and depositing this concentrate into the female partner's uterus when she is ovulating. This is known as 'artificial insemination'. If this fails, the couple is offered artificial insemination using donor sperm. A higher success rate us predicted [77], if the female partner is of a younger age.

With regard to childbearing, the need to fulfil sociocultural obligations is intertwined with the expectations of the couple who want to have a family. If the desire to bear a child remains unfulfilled, despite trying, help-seeking behaviour is fostered, and many couples can go to great lengths to be able to parent a child. This can lead to considerable stress with resultant anxiety and depression [78], which may paradoxically influence further attendance of the couple for medical consultations. The couple seeking fertility treatment may ultimately seek assisted conception. Nevertheless, selecting this route of management increases the couple's stress and anxiety levels incrementally. The couple often accept a different method of assisted conception because the previous method has failed.

Although the outcome of certain assisted conception techniques is shrouded in uncertainty, with variations in success rates among different providers, it is the only hope for many couples, including those with unexplained infertility [79]. This need perpetuates a demand. The demand for assisted conception results in clinical applications of emergent techniques. Intracytoplasmic sperm implantation to overcome male infertility was started even before the long-term effects on the conceptus thus conceived were known. Other novel techniques were also promoted before any negative effects on the conceptus of using such technology was known for certain [80]. Many health providers strive to provide a better method to achieve a successful pregnancy outcome,

and try to satisfy couples who suffer psychosocially because of infertility. In certain cultures, the inability to conceive is blamed on an inadequacy of the female partner, so that the male partner refuses to attend for relevant investigations and the woman continues to suffer guilt [81], even if her investigation reports fall within normal parameters.

It is important to remember that emotional pain increases with every failed attempt to conceive. Many infertile couples dislike the thought of surrogacy or adoption, although some have to accept it as a last resort. During the provision and failures of the various assisted conception techniques offered today, multiple ethical issues are raised when outcomes end in stressful biopsychosocial consequences, with emotional trauma for would-be parents. Provision of ongoing support is essential for couples who have undergone assisted conception to reach parenthood, and often for their offspring who are born of assisted conception. This is even more pertinent for the child who reaches the legal age when information regarding the surrogate parent/donor involved in the conception, can be accessed by offspring born by assisted conception.

Provision of fertility services remains an advancing field with providers and service users having to balance the expenses for investigations, and sometimes contentious treatment, against a successful pregnancy outcome. Therapeutic cloning and stem cell research to help couples with genetic disorders conceive continues to progress, but it has raised pertinent ethical concerns [82]. Similarly, pre-implantation genetic diagnosis allows couples with genetic disorders to have normal babies [71]. Any misuse for producing designer babies or sex-selection needs strict regulation. Furthermore, prior to cancer treatment, gametes are being preserved in some fertility centres to allow couples to parent in the future [83,84]. Fertility-sparing cancer surgery is also being encouraged to enable conceptions at a later date [85]. The emotional and psychological effects of undergoing treatment for infertility still remains stressful [86]. Stress via the HPA axis can affect the woman's endocrinological milieu and cause menstrual irregularities, including the rare pseudocyesis [87], when an infertile woman strongly desiring a baby feels pregnant. Hence, measures to reduce stress, including safe complementary methods, should be encouraged, bearing in mind the beneficial psychosomatic advice to reduce emotional stress and enhance fertility.

Whether the psychogenic factor is the cause or the effect of the infertility, is debatable. There are limitations to being forthright when assessing patients, for their responses can be influenced by a need to appear as 'good patients', and subsequently trying to project a lower level of distress. A report [88] on the assessment of emotional distress in couples during IVF treatment has indicated that there is a statistically significant correlation between dysphoria and pessimism within the individual, and between partners; their perceived stress can be mitigated by directing discussions towards a supportive ethos that the couple believe in [89]. A higher level of pessimism reportedly correlates with a longer duration of controlled ovarian hyperstimulation. Furthermore, on adjusted analyses, the partner's depression score was found to be an independent predictor of the reduced likelihood of a clinical pregnancy. The stress of women undergoing assisted conception can lead to increased drop-out rates due to emotional pain, particularly when there is a culmination of anguish after repeated failed attempts. Successful pregnancy rates are increased by behavioural treatment, including stress management. Stress may, moreover, result in sexual or marital conflicts [86], and contribute to the resultant comorbid anxiety or depression not conducive for a healthy relationship, nor being beneficial for childbearing or nurturing a child; this can have long-term [90] biopsychosocial consequences. Where the impact of repeated failures of assisted conception techniques is underestimated by the attending health professionals, the severity of the grief expressed as emotional pain by the couple tends to increase, along with their feelings of desolation. This can lead to further negative psychosomatic sequelae.

Success with IVF can be increased by modifying lifestyles [91, 92], and reducing anxiety through patient education. Political will is also advocated for any measurable success in implementing

preventive measures to reduce the detrimental effects of environmental hazards on fertility [93]. Patient-centred communication using a psychosomatic approach could facilitate culturally sensitive doctor–patient interactions by helping to delineate the couples' concerns unobtrusively, while involving them in the decision-making process. Counselling services will remain over-stretched for some time to come, and a gynaecologist with a psychosomatic specialism could defuse frenzied patient encounters.

Miscarriage

Couples suffer bereavement when the pregnant woman has a non-continuing pregnancy, particularly if the pregnancy was planned. Pregnancy loss, whether presenting before 24 weeks as a miscarriage or later as a stillbirth/neonatal death leaves an indelible mark of sorrow on the couple concerned. Such loss is expressed as emotional pain—one of the facets of 'dolour', which needs to be better understood to facilitate the provision of compassionate healthcare. Around 10–20% of pregnancies end in spontaneous miscarriage, usually by 8 weeks' gestation but the incidence falls at a later gestational age, and the risk is even lower when a viable fetus is confirmed on an ultrasound scan.

Bereavement related to pregnancy loss usually manifests in stages with an initial expression of shock when the couple is informed of a non-continuing pregnancy. The grief perceived is greater when the information is given after the woman has experienced maternal emotions well beyond the early signs of conception, and fetal movements have been felt. Initially, there is non-acceptance along with doubts about the veracity of the information provided at the healthcare facility where she attended for antenatal care. After a variable period, depending on the individual's grasp of the situation, the disbelief is replaced by acceptance of the unsatisfactory pregnancy outcome. The woman is then able to discuss evacuation or emptying the uterus of the conceptus. Both the woman and her partner go through the various stages of emotional turmoil prior to making the decision about evacuating the uterus by either medical or surgical means, or to wait for spontaneous expulsion.

Around 40% of women who miscarry will go through a typical bereavement process, similar to that following stillbirth or neonatal death. When the woman is informed of the non-continuing pregnancy, and there is no obvious cause evident, she may experience a sense of self-blame and guilt. In the first six months, symptoms of low mood/depression are present, and this may be 2–4 times more common than that in the general population. Depression can be accompanied by anxiety [94] with both presenting as dysphoric symptoms. These psychological symptoms become less intense with improvement in mood symptoms within a year of the miscarriage. However, some women may experience an abnormal or prolonged grief reaction, ending in a depressive or anxiety disorder that requires the attention of health professionals. In early studies, depressive disorders were reported in 50% of women, but these investigations were conducted soon after pregnancy loss, and lacked a comparison group. More recent research suggests a rate of around 10% in the first six months, giving a relative risk of 2.5 [94]. For any associated anxiety disorders, the literature is less clear. Reports have suggested an increase in obsessive–compulsive and post-traumatic stress disorders, but more awareness, and further research is required to understand the emotional pain of early pregnancy loss, and how best to manage it.

If miscarriages occur repeatedly, the woman and her partner experience excessive emotion and this places them at increased risk of biopsychosocial symptoms, not only in the short-term but also long-term [95]. Both physical and emotional pain are felt by the woman experiencing pregnancy loss, if it is located at an ectopic site outside the uterine cavity, usually (98%) in the fallopian tube. Although the management of an ectopic gestation [96] can be carried out medically, provided certain criteria are met, such as the presence of a small gestation sac, careful selection

is advocated to achieve a 90% success rate. Critical selection for the apt management avoids the potential risk of undetected rupture that can be grievous, and rarely, fatal. Surgical management to remove the gestation sac and adjacent damaged tissue is the mainstay of treatment where medical management is not advisable or there is a ruptured ectopic pregnancy. The sense of loss when the conceptus is removed persists even with ectopic pregnancies, as expectations of a normal conception are shattered. Further anxiety is created when the woman is informed of the increased risk of another ectopic gestation if she were to conceive again.

Risk factors most clearly associated with the development of psychological morbidity after pregnancy loss include previous psychiatric disorders, poor social or partner support, childlessness, and ambivalence towards the pregnancy [97]. Any perception of inappropriate management of the miscarriage can be misconstrued as 'medicalisation' by some women, although a desire for medical validation of a possible cause of the miscarriage persists in most patients, thereby creating a dilemma during informed decision-making. There is no consistent evidence of an association with sociodemographic variables, duration of pregnancy, or other pregnancy-related factors. The couple's need for biopsychosocial support, and the type and duration of such a support varies according to the personal beliefs of the woman, her cultural identity [97], and her reaction to the pregnancy loss. This is thus specific to each individual. Hence, a psychosomatic approach to providing support is more sensitive to the woman's psycho-sociocultural needs, but its application needs further scrutiny.

There is some evidence of the benefits of psychological interventions. Where benefits have been demonstrated, they have mostly been through interventions targeted at those women displaying early difficulties, rather than in applying them as a general approach to all women who miscarry. However, an empathetic approach, and acknowledgement of the significance of the loss to the woman, is important in communicating with women after they miscarry. Couples also need targeted support during their bereavement in order to prevent their sorrow progressing to a full-blown psychosomatic illness that can have a negative impact on their relationships as well as on any further attempts to conceive. Bereaved mothers/couples may benefit by liaising with local and national, besides community, support groups. In many regions of the world, early pregnancy loss is not given the same recognition or importance as is given to stillbirth or neonatal death. Nonetheless, a few countries, such as the UK, have developed a dedicated 'Early Pregnancy Assessment Unit', which provides physical and emotional support for those experiencing miscarriages.

Stillbirth and intrauterine fetal death

'Stillbirth' refers to a fetus delivered after 24 completed weeks' gestation, which shows no signs of life [98], whereas a late 'intrauterine fetal death' (IUFD) refers to a fetus *in utero* with no signs of life after 24 weeks' gestation. An IUFD can cause a great degree of emotional pain in the pregnant woman for such a pregnancy loss occurs well after she has experienced the symptoms of pregnancy, and has undergone relevant investigations, including an ultrasound scan. Moreover, repeated antenatal assessments will have regularly indicated that she has a normal ongoing pregnancy. This normalcy would have been further confirmed by her daily awareness of fetal movements, which may have been felt by her partner too, and both would have anticipated the delivery of a healthy baby. Therefore, when fetal movements cease, and examinations confirm fetal death [99], the woman and her partner are devastated. The various stages of a grief reaction evolve in the woman and her partner as with a miscarriage but are usually more intense due to the longer period of feto–maternal attachment.

While the woman can wait for spontaneous onset of labour, there are risks of disseminated intravascular coagulation, which can occur in 10% of women after 4 weeks of the IUFD being

confirmed [100]. The woman and her partner have to be provided with the relevant literature and advice about induction of labour, and about the various investigations that need to be carried out to detect a possible cause for the IUFD. Any associated obstetric conditions, which could cause IUFD, such as antepartum haemorrhage, pre-eclampsia, uterine rupture, cord prolapse, and maternal diseases such as diabetes mellitus, have to be managed concurrently as indicated. After obtaining informed consent, investigations need to be carried out to detect recognised causes of the IUFD, such as a congenital malformation, or fetal viral/bacterial or parasitic infections that are associated with maternal infections, and are teratogenic to the fetus. Detailed sensitive discussions regarding the procedure for induction of labour and relevant investigations including a post-mortem of the baby are broached, and must be discussed at length when the couple are able to consent. Arrangements have to be made with those health professionals who are experienced/trained in managing such clinical situations. The aim is to give continuity of care before, during, and after delivery, and to arrange the subsequent culturally sensitive, last rites for the baby after discussing the details with the couple. When hospitalised for labour and delivery, couples have to be given privacy, and the woman's choice respected regarding her selected options for analgesia when in labour, and for suppression of lactation prior to her discharge. All this can cause considerable distress with couples remaining at risk of suffering from dysphoria, besides post-traumatic stress disorder, when a stillborn baby is delivered. Many prefer not to see or hold the baby [100]. Hence, health professionals familiar with a psychosomatic perspective who are trained to communicate sensitively, and tailor care according to the patient's personality/cultural preferences should be able to provide compassionate care to such patients. Table 6.3 illustrates this.

Vignettes 3 and 4 in Table 6.3 depict the emotional pain experienced due to negative outcomes with childbearing that led to biopsychosocial morbidity following assisted conception and an early menopause [101], or after spontaneous conception that ended in a stillbirth but was followed by another pregnancy with a successful outcome.

Table 6.3 Vignettes showing the emotional pain experienced due to negative outcomes with childbearing

	Vignette 3: Ovulation induction and early menopause: Asian patient	**Vignette 4: Late stillbirth: British Asian**
Presentation and management	*Mrs RL, a 36-year-old married, widely-travelled journal editor, who was 170 cm in height and 64 kg in weight, sought consultation in a private hospital for her infertility* ◆ She had had irregular menstrual cycles for 6 months in the past year but currently had monthly cycles; relevant investigations for her and her husband were normal thereby confirming unexplained infertility ◆ She was started on clomiphene citrate for five days monthly, up to a dose of 200 mg for ovulation induction along with monitoring using basal body temperature charts, specific hormonal levels and ultrasonographic imaging	*Mrs NP, a 31-year-old nullipara, married, professional, working in a hospital theatre, was 160 cm in height and 53 kg in weight* ◆ At her first ANC visit at 12 weeks she had no complaints and her physical examination was normal; routine booking assessments were actioned ◆ She had a detailed US/S at 17 weeks' gestation, which showed an active singleton with no anomalies ◆ All haematological reports were normal other than a microcytic anaemia for which she was started on oral iron ◆ She felt fetal movements at 21 weeks and opted for antenatal assessments at hospital

Table 6.3 Continued

Vignette 3: Ovulation induction and early menopause: Asian patient	Vignette 4: Late stillbirth: British Asian
◆ She had ovulated in the last three cycles but did not conceive ◆ Concomitant insemination with the husband's sperm was discussed next, and the couple agreed to this ◆ Mrs RL conceived after the second attempt, and the couple were delighted but quite anxious ◆ Mrs RL booked her pregnancy, early ◆ Despite routine haematological screening, and ultrasound scans revealing no abnormality, Mrs RL continued to be anxious ◆ She monitored her pulse/BP at home with a personal sphygmomanometer even though her doctor had discouraged this ◆ When close to the third trimester, she complained of a rapid pulse at home, which she termed as 'panic attacks'; she requested urgent assessments but her pulse was recorded as normal in the hospital ◆ At one of these visits she complained of chest pain but had a normal electrocardiogram; reassurances were short-lasting, as she was very anxious ◆ Her request to be made part-time at her workplace was accepted ◆ She intended to take maternity leave at 34 weeks, to rest at home ◆ The part-time working did not reduce her anxiety for she wanted someone around her when at home ◆ At her antenatal visit at 33 weeks hypertension without proteinuria was noted, and she was hospitalised for investigations and monitoring ◆ Her husband took leave to be with her in hospital but her blood pressure reverted to normal, and she was discharged after three days ◆ At the next hospital visit at 34 weeks and 4 days she had oedema, moderate hypertension and slight proteinuria ◆ She was readmitted, and started on antihypertensives along with oral steroids to promote fetal lung maturity ◆ She did not like her hospital room; her mother-in-law accompanied her; her husband could not get leave at the time	◆ She was happy with her antenatal care and planned for maternity leave at 32 weeks gestation ◆ When examined at 28 weeks she had a cephalic presentation which was free; routine blood tests were normal ◆ Her next appointment was 31–32 weeks prior to her maternity leave ◆ At her next ANC check the baby had a breech presentation, there was adequate liquor, and a normally beating heart ◆ Two days into her maternity leave, she felt vigorous fetal movements ◆ The next day fetal movements were infrequent without any morning 'kicks' ◆ She rang her consultant who asked her to get this checked in hospital, and to be accompanied by her husband ◆ In the ward, her baby's heart was not localised by the Doppler, and an ultrasound scan by the consultant confirmed an intra-uterine fetal death (IUFD) ◆ The couple were shocked, and very distressed ◆ The consultant briefly explained about the risk/benefits of awaiting spontaneous labour compared with starting an induction of labour (IOL); he gave relevant leaflets ◆ Mrs NP wanted investigations to be sent off in order to find a cause for her IUFD ◆ On the fourth night Mrs NP felt irregular tightenings and wanted pain relief so the couple returned to the hospital ◆ Examination in the bereavement room confirmed that cervical dilation had commenced and pain relief was given with a plan for an induction of labour (IOL) ◆ Mrs NP delivered a fresh stillborn baby with the cord tightly coiled around the neck several times; a partially separated placenta was removed by CCT ◆ Mrs NP stared at the baby, distraught, sad, unable to move or cry ◆ The obstetrician confirmed no signs of life in the female baby ◆ Mrs NP received uterotonics to sustain the contracted uterus, and cabergoline to inhibit lactation

(*continued*)

Table 6.3 Continued

	Vignette 3: Ovulation induction and early menopause: Asian patient	Vignette 4: Late stillbirth: British Asian
	◆ She developed severe hypertension that night with brisk deep reflexes, and was transferred to the high-dependency ward for monitoring; parenteral antihypertensives and magnesium sulphate were given ◆ At dawn, her blood pressure was slightly lower but oedema, and proteinuria were increasing ◆ Escalating abnormalities in the blood parameters suggested a worsening state that required an urgent caesarean ◆ The baby was a male, weighed 2700 g and had all normal findings when checked ◆ Mrs RL's wound infection was treated with two courses of antibiotics ◆ Despite help from her mother, and home-help she could not breast-feed as planned due to her 'sore' wound ◆ She felt low when her husband went back to work after 4 weeks ◆ The baby was bottle-fed until 8 months ◆ At 14 months, the infant's left limbs appeared stiff or floppy intermittently, and a paediatrician was contacted ◆ Mild cerebral palsy was confirmed ◆ The couple felt low and let down ◆ The infant had medical assessments, and imaging followed by treatment ◆ Mrs RL became dysphoric again ◆ Post-delivery her periods had been irregular with scanty flow, and hot flashes, sleep disturbances and 'a sweat' were manifest ◆ Her periods stopped just at 39 years ◆ The gynaecologist sent off investigations, and a high FSH level confirmed a premature menopause ◆ She felt inadequate in every way and low but did not want any treatment for her 'earlier midlife crisis' ◆ She went to a naturopath who started herbal therapy that reduced her hot flashes but did not improve her mood ◆ Counselling, and antidepressants were started but she felt better and came off medication after 16 weeks ◆ Her child started attending a nursery ◆ She continued with her religious rites, and had psychiatric counselling ◆ She took calcium tablets, exercised, and refused any hormonal treatment	◆ The couple gave permission for a post-mortem of the baby, and for her last rites to be carried out at the hospital ◆ Mrs NP felt low but was recovering physically, and was considered fit for discharge the next morning ◆ Regular MW support followed by health visitor support was arranged, and the GP was informed of her high risk of postpartum dysphoria ◆ The couple returned for follow-up at 6 weeks postpartum when Mrs NP seemed low in mood, complained of irritability, and not wanting to go out to meet others ◆ Mrs NP did not want any treatment for this change in her behaviour after experiencing an IUFD of her first-born ◆ The results of the investigations were explained, and there seemed no obvious cause for the IUFD other than the documented cord problem ◆ Mrs NP blamed herself for 'breathing those gases in theatre', and although not proven scientifically thought that this had asphyxiated the baby due to her breathing in anaesthetic gases, along with the baby's cord problem ◆ After discussion, the couple decided to wait a year before trying for another pregnancy ◆ Mrs NP opted to use the barrier method for contraception as required ◆ She conceived after a year, and was booked under a consultant who was familiar with the psychosomatic approach ◆ Mrs NP changed from her theatre-room job to work at theatre reception when pregnant again ◆ She was fearful of another IUFD, and had repeated clinical assessments by the consultant she had booked under, to alleviate her anxiety ◆ She took maternity leave at 28 weeks, and had a term SVD of a healthy baby boy ◆ She was ebullient but needed support to reduce her anxiety until she gradually weaned her child, and introduced him to solid food by nine months postpartum when he was able to chew

Table 6.3 Continued

	Vignette 3: Ovulation induction and early menopause: Asian patient	**Vignette 4: Late stillbirth: British Asian**
Psychosocial initiating and maintaining factors	◆ Mrs RL seemed to have had a happy childhood and adolescence ◆ She had been a healthy adult who travelled widely for her education ◆ Her subfertility, its management, and childbearing were stressful ◆ The operative delivery, inability to breast-feed, and cerebral palsy in her child led to dysphoria ◆ The premature menopause added to her low mood	◆ No health/psychosocial problems were noted in Mrs NP's past history ◆ She had continued to work in the hospital until the 32nd week of her first pregnancy and had an IUFD with no clear cause evident other than the taut cord coiled several times around the baby's neck ◆ Mrs NP presented with a low mood followed by intermittent dysphoric symptoms in her second pregnancy until she had weaned her baby
Impact on the healthcare system and probable explanation for her behaviour	◆ Mrs RL's subfertility along with its management brought about anxiety; low mood was added after she underwent an emergency caesarean; she felt a failure when breast-feeding was unsuccessful ◆ Mild cerebral palsy in the child and premature menopause maintained the dysphoria till until she was treated by the naturopath followed by the psychiatrist	◆ Mrs NP needed support for a year following the IUFD ◆ A second pregnancy generated anxiety, and occasional mood symptoms so repeated reassurance by the obstetric consultant was needed ◆ After the birth of her healthy baby support was needed for eight months because of her fear that something untoward would harm her baby
Implications for training	◆ Failure to recognise psychosomatic interaction by her obstetrician/gynaecologist led to continuing symptoms without relief until 3 years after delivery. Recognising what is significant for the patient by using a psychosomatic understanding promotes effective care	◆ Detecting the anxiety and occasional mood symptoms early, and providing effective patient-centred management was made possible by the consultant's familiarity with the psychosomatic approach. This prevented psychosomatic sequelae with long-term maternal/child morbidity
Was this form of management appropriate and what did it prevent?	◆ The management given could have been better organised had there been recognition of the psychosomatic aspects earlier. Later recognition with appropriate treatment, which was accepted by Mrs RL helped to reduce her biopsychosocial morbidity	◆ The management was appropriate, and prevented progression to a psychosomatic illness, with consequences that would not only impair maternal health but also have repercussions on the child and Mrs NP's relationship with her partner
Could anything further have been done?	◆ Earlier recognition of her biopsychosocial needs and sustained support by a health professional aware of the psychosomatic approach would have prevented mental illness generated by her physical problems after her delivery	◆ There was no evidence of waste anaesthetic theatre gases affecting her first conception but Mrs NP continued to believe this; an earlier discussion may have altered this ◆ The couple did not feel the need for preconception counselling
Other forms of presentations and behaviour	Extreme responses such as self-harm, alcoholism, drug addiction, divorce or separation, could have resulted from these complex experiences of childbearing but the happy background (childhood to young adulthood), and relatively strong coping mechanisms along with appropriate professional help (albeit late), prevented these unsatisfactory outcomes.	

Learning points

In both vignettes shown in Table 6.3 the impact of unsatisfactory pregnancy outcomes and impaired biopsychosocial health led to psychosomatic symptoms. Dysphoria was generated by unsatisfactory outcomes after a much wanted pregnancy. These women with negative pregnancy outcomes and psychosomatic consequences, could have been a costly burden for the health services due to the resulting biopsychosocial morbidity. However, access to appropriate management through private healthcare or through the NHS, limited the damage, and prevented long-term/severe symptoms. The ovulation induction for Mrs RL may have led to the premature menopause [101], which put her at an increased risk of depression [102], as did the unfortunate event of her infant developing a cerebral palsy. Appropriate management of her hot flashes, sleep disturbances, and dysphoria [103], using her preferred coping strategy, which included the addition of religiosity, prevented further negative sequelae. Similarly, the negative biopsychosocial effects of a late stillbirth on Mrs NP were reduced, as her obstetrician gave patient-centred care with necessary medical evaluations while using the psychosomatic approach. This strengthened her coping skills and reduced anxiety, thereby preventing potential mood symptoms. Although help was appropriate, it was somewhat delayed in Mrs RL's case because of the lack of awareness of her biopsychosocial needs among the attending health professionals, and not given to its full extent in Mrs NP's case as the couple did not want it.

The patient-centred approach should remain the cornerstone of optimal biopsychosocial healthcare provision for couples with complex psychosomatic problems related to infertility/pregnancy loss. It is adaptable to any clinical setting, especially those that prioritise patient satisfaction.

Painful conditions related to pelvic organs

Pelvic pain, has been discussed in the gynaecological literature since the nineteenth century with Ferguson writing an essay on this condition [104], and addressing it as a 'most important disease'. It presents as lower abdominal pain, and is classified as chronic [105] when it lasts for six months or longer, and is not associated exclusively with menstruation, intercourse, or pregnancy. A monthly incidence of 1.58/1000 [106] has been reported; it forms 5% of new referrals at general gynaecology clinics [107], and is prevalent in 1 in 6 adult women [105]. Patients are seen by the gynaecologist as a non-emergency at a routine gynaecology clinic, or as emergency admissions due to an acute exacerbation of the chronic condition. The pelvic pain leads to restriction of activities with lifestyle adaptations [108], and sufferers repeatedly use healthcare resources with significant economic costs. In keeping with the multifarious causes of the presentation, and the individualised perception of pain, the presence of a demonstrable organic cause has ranged from 8% to 83% [109,110]. Reported organic causes include adhesions, previous caesarean delivery, endometriosis, adenomyosis, pelvic venous congestion, and nerve entrapment in Pfannenstiel incisions [105], although their presence may not necessarily be related to the pain. This again specifies that a careful patient-centred assessment to reach a diagnosis should be the norm rather than the exception, to enable economically sound management. Other systems reportedly affected are the gastrointestinal, urological, musculoskeletal, and psychoneurological. Laparoscopy has been used for diagnosis and directed treatment, but it is reportedly negative in 50%. In fact, any pathology visualised may not be the cause of the pain. Hence, laparoscopy has been discouraged as a front-line method of investigation for chronic pelvic pain. This cautious approach is of particular relevance in decision-making about laparoscopy in symptomatic teenagers or young adults because of its invasive nature along with a propensity to cause procedure-related complications [105], and adhesions.

Depression and chronic pain

It is recognised that many people experiencing chronic pain, display substantial emotional, behavioural, and social disruption during the early stages of an injury or a disease. Individual variation in the psychological impact and behavioural course of painful conditions varies across individuals, with implications for management. In common with patients who are depressed, patients with chronic pelvic pain, share an inability to modulate or express intense feelings.

Chronic pelvic pain has also been referred to as a psychogenic disease [111], as in many cases, no demonstrable organic pathology is evident. This is borne out by the fact that the pain persists, despite satisfactory treatment of the probable organic cause. Recognised psychosocial risk factors are physical assault, sexual violence [112], and major depression. These can predispose, precipitate, maintain, or aggravate the pain. Moreover, pelvic pain can be used as a means to seek attention or as a defence mechanism to prevent spousal abuse [113].

In populations where risky behaviour is practised, and impaired psychosocial health is prevalent, there is an increased risk of pelvic inflammatory disease with resultant adhesions that could generate pelvic pain. In such circumstances, the patient's perception of her pain could be modulated by her psychosocial connotations, thereby creating a biopsychosocial model of pelvic pain. This then requires a psychosomatic approach for its effective management. Thus, investigation of both organic, and psychosocial causative factors need to be instituted contemporaneously when addressing these complex clinical presentations.

Women experiencing dysmenorrhoea and dyspareunia, may also complain of chronic pelvic pain, and should be managed effectively by giving due attention to aggravating psychosocial factors, besides the biological, when providing treatment. Psychosomatic management can thus restore normal function by giving the patient insight into her condition, thereby reducing her anxiety or emotional distress, and promoting muscular relaxation [114]. This can limit the severity of the pain and make it bearable, which may gradually lead to a cure. The health professional using this empathetic approach may accordingly gain the trust of the patient who would consequently comply with any necessary examination/investigations that her therapy dictates. Such patients who need sensitive handling can refuse examination, and be uncooperative when approached by a rather brusque health professional, despite hoping for their pain to be addressed. Table 6.4 presents the enigma of chronic pelvic pain.

It depicts the puzzling symptomatology of exacerbations of chronic pelvic pain in vignettes 5 and 6, and the need to apply a psychosomatic approach along with the biomedical assessment.

Table 6.4 Vignettes showing exacerbations of chronic pelvic pain

	Vignette 5: An emergency gynaecological admission with abdominal pain: British Caucasian	**Vignette 6: An emergency surgical referral with lower abdominal pain: British Caucasian**
Presentation and management	*Mrs EB, a 35-year-old housewife, parity 1, miscarriages 2: (TOP)1 and one ectopic pregnancy.* Urgent call to assess ◆ Mrs EB was awaiting emergency laparoscopy and hysteroscopy for acute exacerbation of chronic pelvic pain, and was insisting that a hypnotic be prescribed to her as the analgesic administered did not relieve the pain; she was afraid that she had a sinister problem which the attending doctor had missed	*Ms IP, a 25-year-old nulliparous, unmarried, administrator, lived with a partner who worked away from home, and visited for 'emotionally charged' weekends when he could get 'too tipsy'* ◆ Ms IP was admitted in the evening via the A&E Department complaining of lower abdominal pain for a day, 'sharp' in type with radiation to her right thigh but no associated symptoms; the pain was not relieved with oral analgesia

(*continued*)

Table 6.4 Continued

	Vignette 5: An emergency gynaecological admission with abdominal pain: British Caucasian	Vignette 6: An emergency surgical referral with lower abdominal pain: British Caucasian
	◆ She had been admitted earlier on that night via the A & E Department with a complaint of severe lower abdominal pain, stabbing in type, with no radiation, associated with nausea, and painful micturition ◆ She had experienced her usual painful menstrual bleeding 5 days before, her cycles were regular with periods every 25 days, and occasional intermenstrual bleeding but no postcoital bleeding ◆ She had a long history of a similar type of recurrent pain, which was worse during her periods but during the last year persisted as a lower abdominal ache intermenstrually along with deep dyspareunia ◆ She had had an appendicectomy, two surgical evacuations of retained products of conception, laparoscopy with laparotomy, and a right salpingectomy for an ectopic pregnancy; she had repeat pelvic infections, and was on medication for the treatment of endometriosis ◆ She was non-pregnant ◆ Her general observations were stable, other than a tachycardia but her body language suggested severe pain, and frustration with it ◆ She was transferred to the gynaecological inpatient ward ◆ She looked underweight (45 kg), and consented to an examination which revealed a scaphoid abdomen with scars from previous surgeries, soft tender lower abdomen with no guarding or rebound, non-tender loins, and normal bowel sounds ◆ The pelvic examination was deferred for when she would be anaesthetised in theatre, as merely touching the introitus made her tense and contract her pelvic floor muscles—probably vaginismus; so the examination was discontinued with a plan to be carried out later when sedated ◆ The relevant investigations and an ultrasound were normal ◆ Laparoscopy was technically difficult because of adhesions but upon entry into the pelvis, visualisation was clear with no adhesions or endometriotic spots, and surgical intervention was not indicated; the hysteroscopy confirmed a normal uterine cavity	◆ She was non-pregnant, and her general observations were within normal limits other than a pyrexia of 37.4°C ◆ Her BMI was 21, she had a figure-of-eight bandage and sling for a recently fractured left clavicle, and support for a fractured right patella with a foot drop, which she said had been sustained by a recent fall ◆ She consented for examination in a side-room but mentioned about discomfort during vaginal examinations; the attending gynaecologist assured her that the process would be gentle and the examination findings explained; the examination would be stopped if requested, which reassured her ◆ On examination, her abdomen with several scars from previous operations, was soft, non-distended, with the lower part slightly tender on deep palpation without guarding or rebound, she consented for a gentle vaginal examination, which revealed a small collection of blood in the posterior fornix, and a slightly tender cervix; infection screening with triple swabs was undertaken ◆ An abdominal ultrasound scan revealed an anteverted uterus 7.5 × 3.3 × 4.5 cm, with normal morphology, a normal left ovary, the right ovary was not visualised and there was no free fluid ◆ She had a history of pelvic infections, an appendicectomy, laparoscopy for pelvic pain with adhesolysis twice, first when the right ovary, the ampulla and fimbrial end of the right fallopian tube were freed of adhesions as was the left ovary, which had dense adhesions to the pelvic side-wall, there was no evidence of endometriosis; at the second laparoscopy omental adhesions were lysed to gain pelvic access, the appendix was notably absent with no bowel involvement, the pouch of Douglas was clear, the uterus was anteverted normal sized, flimsy tubo-ovarian adhesions were lysed

Table 6.4 Continued

	Vignette 5: An emergency gynaecological admission with abdominal pain: British Caucasian	**Vignette 6: An emergency surgical referral with lower abdominal pain: British Caucasian**
	◆ After reassuring her of the findings she was discharged on oral antibiotics, and analgesia that had given her pain relief ◆ She was asked to keep a pain diary, and return for reassessment after 3 months if she felt the need for another consultation	◆ On this day, Ms IP was on parenteral fluids, antibiotics, and analgesia ◆ She had been fasted, and was under observation on the surgical ward as the gynaecological ward was full ◆ Her pain was subsiding and the examination and scan findings were explained; a surgical procedure was considered unnecessary, and she accepted this and began mobilising ◆ After four days she was discharged on oral analgesia to her GP's care
Psychosocial initiating and maintaining factors	◆ Mrs EB had a TOP in her late teens, and this was followed by two unsatisfactory relationships ◆ Her partner of five years was violent and she moved out of the abusive relationship after his recent conviction, and because of her dread that he would be violent to her 6-year-old daughter who lived with her ◆ She had started divorce proceedings but was afraid that her husband would return, and harm her once he had completed the term of his restraining order as laid down by the court	◆ She could not get along with her parents when a teenager, and had lived away from home in her teens ◆ She had a previous relationship with a violent partner but did not complain about her current partner ◆ She appeared unclear about her recent fractures, she had several admissions for pelvic pain; her history was suggestive of a latent psychosomatic disorder but she was reticent about her current relationship, and any biopsychosocial vulnerability was unknown
Impact on the healthcare system	◆ Mrs EB's long history of pain revealed her vulnerability, which possibly affected her personality and perception of pain, with anxiety and fear making her seek repeat hospitalisation for the complaints ◆ She had been reticent earlier about her husband but recently had accessed social-work support, which would probably be needed long term ◆ She wanted to remain in the area so could not be transferred to a 'shelter home' ◆ Additional costs for health and social care services would continue	◆ Ms IP's repeat hospital admissions suggested that she would be using healthcare facilities repeatedly, and may finally request major surgery for the removal of her pelvic organs ◆ Although she did not express dissatisfaction with the status of her current relationship, it appeared that the partner's support was not forthcoming ◆ She leant heavily on the health service for her healthcare, which shouldered additional economic costs due to her physical/mental problems
Implications for training	◆ Failure to recognise the impact of chronic symptoms exacerbated by psychosocial factors, and not giving such patients 'space' as advocated in psychosomatic training, is highlighted. Empathic listening can promote patient-centred effective management	◆ The failure to recognise the impact of chronic symptoms exacerbated by psychosocial factors as is advocated in psychosomatic training is highlighted; these result in repeatedly seeking healthcare even if assessments are negative

(*continued*)

Table 6.4 Continued

	Vignette 5: An emergency gynaecological admission with abdominal pain: British Caucasian	**Vignette 6: An emergency surgical referral with lower abdominal pain: British Caucasian**
Was this form of management appropriate and what did it prevent?	◆ The management was appropriate as it helped Mrs EB gain an insight into her problems. It prevented unnecessary surgery, which would not have given pain relief, but may have made her frustrated, leading to increased biopsychosocial symptoms.	◆ This form of management was apt for it prevented emergency surgery, which would not have relieved Ms IP's pain. Thus, unnecessary usage of healthcare resources was prevented, and Ms IP appeared satisfied with the consultation.
Other forms of presentations and behaviour	Overt presentations of physical abuse, menstrual problems, vaginal discharge, unwanted pregnancy, anxiety, post-traumatic stress disorder, depression, symptoms of sexually transmitted infections such as in hepatitis, syphilis, and HIV infection, can be associated with chronic pelvic pain. Symptoms of gastrointestinal (IBS), urological (interstitial cystitis), and musculoskeletal (fibromyalgia) conditions may also be manifest.	

Learning points

In both vignettes who had chronic pelvic pain shown in Table 6.4, the aetiology remained unclear. Intensive investigations were carried out and analgesics given repeatedly at each hospital admission, but Mrs EB and Ms IP obtained only partial pain relief. The psychosomatic approach, which promotes attention to sensitive issues, while obtaining a comprehensive biopsychosocial history, helped in managing these clinical scenarios. The approach was useful for gaining the patients' confidence so that they accepted the management offered along with the decision for their discharge back to primary care. These patients had previously remained reliant on the secondary/tertiary level of healthcare provision for relief from recurrent episodes of pelvic pain. The health service bore these recurrent treatment costs. They could have benefited from earlier intervention using a psychosomatic approach when the chronic pelvic pain was first identified. This may have facilitated the start of the healing processes required, by gaining entry to the over-regulated primary adaptive emotional experience [115] through the application of certain psychoneurological techniques learned in psychosomatic management.

At any clinical encounter with a patient with chronic pelvic pain, it is important to keep in mind its multifactorial origin. The numerous gynaecological causes, such as pelvic inflammatory disease, endometriosis, adenomyosis, adnexal causes, or congenital anomalies of the reproductive organs, can all contribute to the pelvic pain. However, other disorders of the gastrointestinal tract, such as irritable bowel syndrome, or those of the urinary tract, such as interstitial cystitis, as well as neurological, psychiatric, and psychological conditions or musculoskeletal disorders can also present as chronic pelvic pain. The similarity of symptoms predicates the need for exclusion of these competing aetiopathologies by a rigorous clinical evaluation. Provision of effective pain relief along with the management of biopsychosocial causal factors need concomitant attention. Subsequently, conservative management should be offered as a first step.

Pertinent issues regarding the clinical characteristics and management of chronic pelvic pain followed by that of endometriosis, are now further examined. This provides added insights into managed psychosomatic care for these patients, in order to reduce morbidity from these common conditions.

Chronic pelvic pain: a psychosomatic manifestation of varied pathogenesis

Chronic pelvic pain can be a symptom of an underlying disease, which has led to tissue or nerve damage resulting in the pain, or it can manifest without being the sign of an underlying disease. Chronic pelvic pain can be a clinical challenge as it can be a continuum, and can fluctuate between having or not having an association with a disease. Chronic pain can be cyclic or non-recurrent, intermittent or continuous, and is located in the lower abdomen and pelvic region; it leads to both physical and emotional pain with deterioration in the quality-of-life of the patient [116].

Epidemiology

In a meta-analysis [117] comprising 178 studies and 450 000 women, the authors selected studies of superior methodological quality. They then categorised the prevalence of chronic pelvic pain in these patients according to their associations, as:

- Associated with dysmenorrhea—prevalent in 17–81%
- Associated with dyspareunia—prevalent in 8–22%
- Non-cyclic chronic pain—prevalent in 2–24%

This large variation in the prevalence rates reported in different studies [117] indicates the difficulties that arise when investigating a clinical condition, which cannot be measured by the objective parameters in current medical practise, but is based on self-reports of patients. The frequency of the condition is therefore related to the characteristics of the population studied.

Among the variable prevalence rates reported, Zondervan et al. [118] mention that 15% of women suffer from chronic pelvic pain in the USA (aged 18–50 years), whereas it affects 38/1000 in the UK (aged 15–73 years), and that in 10% of all gynaecological consultations, chronic pelvic pain is the main topic. Mathias et al. [119] investigated women with non-cyclic lower abdominal pain, and found a prevalence rate of 14.7% among women between the ages of 18 and 50 years. In 61% of these women, the cause for the complaint was 'unclear'.

The following four mechanisms can be implicated in the complex aetiopathogenesis of chronic pelvic pain:

1. Chronic pelvic pain can occur as a result of tissue damage, which activates C fibres that transmit pain signals to the higher brain centres. The mechanism can explain pain related to endometriosis, chronic pelvic inflammatory disease, musculoskeletal diseases, chronic inflammatory bowel diseases, and chronic urological disorders.
2. Chronic pelvic pain can occur as a result of damage to the neuroanatomical structures transmitting pain signals (neuropathic pain). The mechanism can explain the pain due to lesions compressing parts of the pelvic plexus, hypogastric nerve and pelvic nerve.
3. Chronic pelvic pain can occur as a result of an altered central nervous system processing of bodily signals leading to a distorted pain perception. The mechanism can explain the pain related to depression, somatoform disorder, post-traumatic stress, and previous sexual abuse.
4. Chronic pelvic pain can occur because of ill-understood complex interactions between biopsychosocial factors in the various organ systems affected.

The psychosomatic diagnostic approach for assessing chronic pelvic pain

Two distinct approaches to assess and manage chronic pelvic pain can be observed in clinical practice:

a. *The sequential approach*: The patient is seen by one medical specialist first, who excludes diseases related to his specialty. She is then sent to the next specialist, who excludes diseases

relevant to his speciality. Finally, the patient is sent to a psychiatrist/psychologist to exclude mental disease, which could be associated with the chronic pelvic pain.

b. *The multidisciplinary approach*: At the first consultation, the patient is informed about the possible multifactorial origin of her pain, and that she will be seen by a multidisciplinary team, whose work will be coordinated by a primary physician. The primary physician would then be the person responsible for coordinating the multidisciplinary management, and who would provide continuity of care.

A well-designed study has shown that the prevalence rate of patients with persistent chronic pelvic pain not responding to treatment is significantly lower in patients who are managed by using a multidisciplinary approach [120].

The authors propose here a structured diagnostic approach, during which the primary physician supports the patient, as she receives the comprehensive biopsychosocial assessments, and patient-centred care is initiated.

Step 1. Listening to the patient and encouraging the narrative Provide the patient with 'time and space' to tell the story of her pain. This may start with,

> "Tell me all about your pain and why you think it is so important for you to seek treatment. It will make us understand your illness better …"

The physician pays critical attention to the words the patient uses to describe her pain, the emotions expressed in her body language, the methods she uses to explain about her pain, how she relates to her experience in dealing with it, and any questions she may have regarding it. In these first few minutes, the physician gets important information about her affective state, cognitive patterns, explanatory contents, and ways of coping, which will be useful in establishing a diagnosis, and deciding about the most appropriate form of treatment.

Step 2. Directed and differentiating questions After listening to the narrative of the patient, the physician takes the lead in the interview. The following questions are used to obtain a precise description of the pain:

- Where is the pain? Is it in the lower abdomen, the back, the vulva, etc.? Is it radiating from the same spot or is it present at different locations at the same time?
- When does it occur? Is it related/unrelated to the menstrual cycle?
- How severe is it? The intensity is explored using a Likert Scale.
- What are the affects? Is there an impact on quality-of-life, professional and private life, and sexuality?
- What are the triggers? Is it initiated by life events, stress, occupation, sexual activity? What reduces the intensity? Is it previous experience or ways of coping, using medication, or carrying out activities that distract from the pain?

This part of the interview provides the physician with the baseline information about the individual's psychosocial variables, which may be important modulators of her pain experience.

Step 3. Biopsychosocial history This includes the biomedical (medical) history, along with any psychosocial associations of relevance.

The medical history explores past and present biomedical diseases, any treatments that she received, and her psychosocial responses to the detection and management of any disease. This includes previous operations, urogynaecological diseases, gastrointestinal disorders, disorders of the musculoskeletal system, psychiatric diseases, or mental health disorders.

The expanded psychosocial history explores major life events, including experiences of violence and abuse, 'fractured' vital relationships; actual life situations related to her profession and family. Enquiries are also made about possible stressors and supportive resources, and her self-rated balance of challenges and fulfilled needs. This also includes any experience of achieving the right balance between her efforts in reaching her goals, her successes, and the time taken for recovery from her efforts to reach a goal.

This detailed 'history' provides the physician, not only with important current factual information, but also with background information about the personality of the patient, i.e. her way of thinking or expressing herself, any hesitancy or specific responses to questions, which will form part of this individual's diagnostic work-up.

Step 4. General physical examination Along with the routine measurements of her weight, pulse, blood pressure and respiratory rate, and note of her appearance and walk when entering the consulting room, attention is paid to other signs of musculoskeletal disorders. This includes exploration of the Carnett's sign and possible trigger points indicative of fibromyalgia or musculoskeletal pain [121–123] after having obtained her consent for examination, including the gynaecological speculum, and pelvic examination.

Step 5. Gynaecological examination It is important to examine the patient very gently and communicate with her during the physical examination. Important signs to look for are: abdominal and pelvic floor rigidity during the examination; signs of vaginismus; lateralisation of the cervix; cervical stenosis; tenderness of the uterosacral ligaments and the pouch of Douglas; tenderness on moving the cervix or touching the uterus; tenderness and/or masses in the adnexal region [124].

Step 6. Investigations including laboratory-based and imaging studies Discussions with the patient involve sensitively given advice about carrying out relevant laboratory investigations, including, haematological, such as a full blood count with differential count, a CRP assessment, screening for cervical pathogens including *Chlamydia trachomatis*, and (if indicated) for the gonococcus, and investigations for other STDs, in order to aid detection of pelvic inflammatory disease. The imaging studies offered can include ultrasonographic scanning, abdominal, or TVS (if accepted), to detect adnexal masses and indirect signs of adenomyosis; MRI scans to assess palpable pelvic nodules, rectovaginal disease, and to diagnose adenomyosis (if indicated).

Step 7. Interdisciplinary consultations At this step the patient can be included in the work-up for the management of her chronic pelvic pain. An explanation should be given to her that, due to the multifactorial pathogenesis of the pain, it is important to look at different organ systems possibly involved in the causation of her pelvic pain. The consultation could be further extended to involve the specialties of urology, orthopaedics, gastroenterology, neurology, and mental health (if indicated), after review of her physical findings and investigations. It could also involve consultations with a general gynaecologist, preferably trained in psychosomatic gynaecology. It is important that these referrals are coordinated and the findings collated by the patient's primary physician, who should then proceed to help the patient understand the results, and put them into perspective regarding her pain management.

Step 8. Laparoscopy In some patients, it may be necessary to discuss further investigations such as laparoscopy, to either confirm or exclude organic disease, such as endometriosis. This intervention can be crucial for understanding the cause of the pain and it is therefore important that, at the preoperative consultation, the gynaecologist clarifies to the patient the purpose of this intervention [124,125]. She is informed about its purpose to exclude/confirm organic disease, and to carry

out any specific treatment that is indicated if a lesion is visualised but that it has risks, and that an informed decision is needed.

Step 9. Establishment of a comprehensive biopsychosocial diagnosis With the information obtained in the previous steps, it is possible to construct what is alluded to as the 9-field matrix (see Chapter 2). This 9-field diagnosis has three horizontal dimensions (biomedical, psychological, sociocultural factors) and three vertical dimensions (predisposing, precipitating, and maintaining factors). The different types of information can be slotted into the corresponding fields to give a structured and comprehensive overview to assist the physician and the patient in deciding on the plan of management.

The therapeutic approach to managing chronic pelvic pain

The biopsychosocial model guides the therapeutic approach with several objectives and levels of intervention according to the clinical, and investigative summary for each individual being treated.

Offer patients a stable and helpful therapeutic relationship

The importance of the patient–doctor relationship lies in the fact that the treatment of chronic pain may be for a long duration, with exacerbations and remissions reflected in treatment successes and failures, and the pain may not disappear soon or entirely. The physician's role in this context is to help patients understand the cause of their pain, the conditioning factors, the different ways in which these factors interact, and the support that will be available/given during her treatment. This is of import when there are problems with patient compliance, and there are difficulties in the acceptance of the treatment offered, or there is a failure of the treatment given.

Treat biomedical diseases contributing to the pain

These may include referrals to specialists for the treatment of endometriosis, irritable bowel syndrome, interstitial cystitis, fibromyalgia, urological, and orthopaedic diseases. This could involve concomitant treatment [126,127] with NSAIDs or hormonal treatments such as with gonadotrophin releasing analogues or anti-progestogens such as gestrinone, danazol, or other medication, e.g. aromatase inhibitors. Operative interventions should be a last resort and preferably carried out after the patient's family is complete.

Treat chronic pelvic pain as a separate clinical entity

In many cases, the therapeutic approaches described remain unsatisfactory, either because there is no defined underlying organic disease or the pain has developed an independent pathway, discrete from the primary cause. These patients need a combined pharmacological and psychotherapeutic treatment schedule, such as operant conditioning, cognitive behaviour modification, biofeedback, hypnosis, acupuncture, small group therapy, or counselling, along with medication, e.g. antidepressants, as indicated.

Pharmacological and operative treatments

A first-line therapy is long-term treatment with NSAIDs, independent of pain episodes. However, evidence is lacking in confirming its effectiveness in curing chronic pelvic pain. Again, antidepressants have been used to help cope with the pain but their use remains controversial. Sertraline was tested in 23 women with chronic pelvic pain [128], but it was not superior to placebo. Amitriptyline was considered significantly superior to placebo and a combination of amitriptyline and gabapentin was considered effective. Gabapentin monotherapy was also considered more effective than placebo in these studies [129].

More invasive management strategies in the form of surgical procedures, including division of deep adhesions or more invasive procedures such as the removal of the uterus and/or ovaries, should be used judiciously as the last resort. Chronic pelvic pain may persist, despite aggressive surgery, as was noted many decades ago [2]. Other operative interventions for pain reduction such as lumbar uterine nerve ablation or hysterectomy remain debatable. It may well be that in patients with adenomyosis uteri, hysterectomy is effective but patient selection for the appropriate operative treatment remains a clinical challenge. As chronic pain can be a learned behaviour, it can persist even after a hysterectomy [2], causing frustration when treatment options are exhausted. This can make the patient depressed. If the clinician is familiar with the psychosomatic approach, it would help to facilitate communication with these patients, who live with this chronic recurrent disorder that is modulated subjectively, and also aid the selection of the appropriate treatment for the involved biopsychosocial factors. This can prevent prolonged polypharmacy and unnecessary use of medical resources, particularly where finite.

Psychotherapeutic interventions

There are several psychotherapeutic techniques available, although there are no well-designed intervention studies. The basic element that can have a therapeutic effect is *offering stable professional support*. This includes providing the support requested to enable the woman to cope with the emotional pain resulting from the chronic pelvic pain, providing further information about the disease, and suggesting strategies to help in generating 'hope', where indicated.

Offering cognitive behavioural techniques These interventions are based on the principle that thoughts are directly linked to emotions and emotions are linked to physical processes [130], especially those occurring in the vegetative regulatory system. Pain signals lead to cognitive reactions such as '… this pain will kill me … maybe I have cancer … this pain will linger and never go away … it is always there …', which evoke emotions of fear, hopelessness, frustration, anger, etc. These in turn will be accompanied by neurovegetative, neurovascular, and neuromuscular reactions, which may intensify the pain and start a vicious cycle, which further exacerbates the pain. In therapy, these dysfunctional thoughts should be looked for, and the patient has to learn about how her way of thinking influences her perception of the pain and physical functioning. She learns how to modify the dysfunctional thoughts in her 'mind' (cognitive reframing), and by so doing, induce 'healthier' responses of her 'body', that is, the involved organ systems—an important aspect of psychosomatic patient-centred management.

Teaching relaxation techniques Cognitive interventions can often be accompanied by relaxation exercises, through which the patient learns how to influence muscular and neurovegetative processes by self-hypnosis, breathing techniques, etc. Using these coping skills reduces the severity of the pelvic pain perceived by the patient that had been maintaining an increased sympathetic drive in her, which in turn had increased the generalised tension in her body. This method modifies her response to the perception of her pain, and helps in diminishing its severity.

Nonspecific measures These include social support, as for example, inviting the partner and/or other family members to receive further information about the condition so that they can aid in the patient's recovery or by joining a self-help group.

Endometriosis: variegated psychosomatic symptoms from a similar pathogenesis

Endometriosis deserves a special mention here, as it can cause biopsychosocial affects leading to major psychosomatic diseases. It generates pathological processes that result in chronic pelvic

pain (50%), as well as subfertility (40%), and spontaneous miscarriage. It usually manifests in women between 30 and 40 years of age, with symptoms caused by endometrial implants (both glands and stroma) undergoing cyclical changes with the menstrual cycle. This results in scarring and adhesions at these sites in the pelvis and abdomen, and infrequently within abdominal scars, or rarely in the lungs or the brain. Presentations at a gynaecology clinic are *mainly* related to the pelvic organs, with symptoms presenting as dysmenorrhoea, menorrhagia, intermenstrual bleeding, deep dyspareunia, haematuria, and dyschezia, or bowel symptoms of diarrhoea, constipation, and bloating.

Hypotheses about the causation of its pathological effects have spanned centuries, with suggestions that it is due to implantation of endometrial cells to other sites or transformation of undifferentiated mesenchymal tissue to endometrial glands, and stroma at these sites. Again, endometriosis can be caused by being exposed to environmental immunotoxic agents, which are able to exert immunosuppressive effects that involve T cells or B cells, macrophages, and prostaglandins, with facilitation through genetic/epigenetic pathways; they thereby exert these effects by the presence of endometrial cells lodged at various sites that cause specific symptoms. A consensus about the mechanisms involved in the aetiopathogenesis of endometriosis is yet to be reached because of insufficient scientific evidence regarding this complex health condition. Nonetheless, it is widely recognised that oestrogens can accelerate its spread, and that the menopause inhibits this.

It may be clinically silent, with its presence in the pelvis detected only by a chance laparoscopy for another indication such as when investigating an unruptured ectopic gestation. Fertility can be compromised both by its effects on fertilisation, ovum transport, or embedding of the zygote, or due to pregnancy loss as it increases the risk of spontaneous miscarriage. Assisted conception using IVF also has a lower success rate in women with endometriosis. Treatment [131] using gonadotrophin analogues to suppress ovulation, and create an artificial menopause can help in those patients who have completed their families, but add-back therapy is needed to limit the adverse effects of the menopause thus created. Various surgical procedures to treat endometriosis and its effects on adjacent organs are available. Success is greater where minimal distortion of the anatomy due to the disease has occurred, which results in better outcomes when using minimal invasive techniques. However, satisfactory relief of all related symptoms is not always obtained. Aggressive surgery on pelvic organs using a multidisciplinary surgical team to manage endometriosis during the reproductive years, should only be resorted to with careful counselling, as symptoms can persist even after such surgery. Awaiting symptom relief, which can occur with the onset of the menopause is an option acceptable to some patients but recurrence may occur if hormonal replacement therapy is then initiated.

Managing endometriosis: increasing understanding of the psychosomatic approach

The psychosomatic approach focuses on the patient with the disease more than on the disease itself. From a patient's point of view, based on her experience of her symptoms, endometriosis has six aspects that may need appropriate attention.

A difficult and often delayed diagnosis

Several studies have shown that there is a long delay between the first symptoms of the disease and the final diagnosis. This means that the patient is suffering for a long time without having a medical label for this suffering. Many patients feel misunderstood and they complain about the frequent psychiatric labelling they get, which sometimes leads to increasing mistrust of medical professionals, especially, those managing mental illness.

Basic psychosomatic care for these patients should involve giving due respect to and acknowledging their concerns along with facilitating 'active listening' of their complaints. A patient's belief about the cause of her health problem should be elucidated, and given credence. She should be encouraged to participate in the diagnostic process and bring in her concerns, doubts and eventually, informed decisions, to the discussions. The management plan relates to the elaboration of a shared concept of possible multiple extrauterine sites, where endometrial tissue is present, and generates symptoms of endometriosis that contribute to the patient's suffering. It is therefore necessary that the physician, and the patient, work out a shared model of understanding the disease as a biologically-based complex disturbance of neurovegetative, neuroendocrine, and emotional pathways; this helps to prevent later misunderstandings, and possible disappointment.

This psychosomatic perspective to management is very important, as there is no clear correlation between the extent of endometriotic lesions, and the symptoms reported by the patient. A frequent mistake made in the management of endometriosis is following the concept of mind–body dualism. The psychosomatic approach removes the divisive perspective of it being either organic or psychogenic, which limits one's understanding of the effects of endometriosis that cause the individual's suffering. Comprehensive treatment strategies can then be developed, which include both physical and psychosocial factors, thus enabling the provision of effective patient-centred healthcare.

Unclear aetiopathogenesis

The aetiopathogenesis of endometriosis is not completely understood. It is known for certain from research on 'stress', that conditions not well explained to the patient create distress, and patients with fear can associate diseases with more grievous health conditions such as having 'cancer'. Consequently, the patient may develop an anxiety disorder or a low mood, and as the lay population are generally unfamiliar with endometriosis, the patient finds it difficult to talk about its effects and its ongoing management, with others. This can lead the sufferer into possible social isolation and withdrawal.

Psychosomatic consultations attempt to give the patient psycho-education by, not only giving detailed information about the disease, but also obtaining feedback from her, by encouraging questioning from her, her partner and/or her family; this helps to empower her, as early as possible, regarding the disease and her management options.

A chronic recurrent disease

A patient suffering from endometriosis may go through severe stress and may believe that it is incurable. They need more courage to maintain a positive outlook towards their lives after receiving the diagnosis, as it will be compromised by frequent hospital visits, and a dependence on the healthcare system. To obtain treatment for endometriosis, if patients follow the conventional hospital care plan, they have to maintain a rigid hospital follow-up regime, and their multifarious symptoms may cause difficulties with regular attendances. There may be added infringements on their occupational role, and in maintaining relationships with their partner/family/friends.

When receiving psychosomatic-oriented care, these patients are helped by a supportive medical team who empathise with their health condition; the management style is able to allow more flexibility with their appointments, besides providing empathy after treatment failures. A stable doctor–patient relationship is also established where continuity of care is promoted, with the doctor usually prepared to face and discuss treatment failures with the patient, even if this occurs repeatedly. Patients with endometriosis may develop depression as a comorbidity, which should be detected and treated appropriately.

A disease of young women

Being a disease of young women, endometriosis affects a cohort who are considered to be healthy and attractive with many starting a career, travelling, and developing relationships. Chronically ill women can be stigmatised by their peers, and hence, are at risk of being socially isolated. This could cause bitterness and lead to a vicious cycle of reproach and withdrawal, even from those who have been previously close to them, consequently creating a further increase in the perceived severity of symptoms.

In basic psychosomatic healthcare provision, there is awareness of these specific stressors, and physicians pre-empt having to address such feelings and difficulties when encountering these patients. Other than the patient's health education, going to a self-help group is encouraged if it is socioculturally acceptable to the patient. The physician also invites the partner/family of these patients to be present at consultations to facilitate discussion of any relevant issues related to the impact of endometriosis on them.

A cause of chronic pelvic pain

Chronic pelvic pain is one of the prominent symptoms of endometriosis. Chronic pain leads to a vicious cycle of pain, fear of pain, inhibition of tasks, and continuing apprehension about more pain. The pain again leads to inactivity and withdrawal, which can severely damage her perception of her body image and sexuality, as well as initiate dyspareunia, if she is sexually active. Dyspareunia, if present for a significant duration, may lead to other sexual problems such as a lack of desire with arousal difficulties, and these symptoms need additional therapy.

Basic psychosomatic healthcare addresses the importance of effective and adequate analgesia for the patient with endometriosis, and actively addresses issues of body image and sexuality. Patients may not have the courage to talk about these intimate issues, but the psychosomatic-oriented gynaecologist can facilitate this by actively giving them 'permission' or opportunity so that they have the confidence to broach the subject.

Infertility and subfertility

The other hallmark of endometriosis is its association with infertility/subfertility, which brings about a crisis with a threat to self-esteem, self-confidence, and sexual identity. This can then be followed by secondary affective and somatoform disorders. In many patients, infertility/subfertility equates with the destruction of a life-concept, and also of a concept about themselves and their capabilities.

A doctor with a psychosomatic understanding can proactively respond to the crisis brought about by infertility/subfertility, and its management. The doctor can offer counselling, help patients accept comprehensive multidisciplinary medical care, and guide them through the various treatment options on offer for infertility, along with providing biopsychosocial support if there are failures of treatments.

Developing a psychosomatic care pathway

Basic psychosomatic healthcare

This can be summarised in the following steps:

a. View the disease through the patient's eyes, that is, understand the specific characteristic of the disease from a patient's perspective
b. Establish a helpful therapeutic relationship with patient-centred communication, shared decision-making, the response to emotions, and facilitate collaborations between the personal physician (gynaecologist/GP) and a multidisciplinary team

c. Inform and educate the patient, and empower her so that she does not feel a lack of control regarding the management of her disease. Simultaneously try to improve her understanding of the 'multifactorial' aspect of the disease, and involve partners/close family members in the discussions
d. Teach basic skills regarding how to handle her stress, anxiety, and frustration with failures that can occur intermittently during her treatment.

In addition to basic psychosomatic healthcare, patients with endometriosis may also need specialised psychosomatic interventions by specially trained health personnel.

Specialised psychosomatic healthcare

Psychosomatic-oriented pain service Pain as an experience has four different dimensions: the biological processes that underlie the pain, the cognition, the emotional, and the behavioural aspect. The biological processes are characterised by inflammation, muscle tension, changes in vascularisation, nerve compression, and neurochemical reactions.

Difficult cognitions in the pain experience are catastrophising, generalising, and having irrational beliefs and concepts, about the source of the pain. On the emotional level, patients experience anxiety, helplessness, anger, and frustration, and express a pain-related behaviour. This is often characterised by avoidance and withdrawal on the one hand or very frequent visits to the physician on the other, often to access medication for reducing her pain.

The specialised pain services aim to create, in conjunction with the patient, alternative models of processing of body signals. Apart from biomedical interventions, there are cognitive behavioural techniques, which try to help the patient understand the interactive processes of body-perception, emotions and thoughts, along with interpretation and behavioural consequences. Specialised pain services can apply hypnotic and imaginative techniques. The therapist may heal by using the effect of a trance with a post-hypnotic task. A self-induced trance may be used with certain exercises such as 'the safe place' or 'the inner-journey' that is characteristic of guided imagery. The physiological and vegetative reactions can be influenced by relaxation techniques, especially, specific breathing techniques.

Psychosomatic-oriented healthcare for the infertile couple This specialised service follows the general principles of psychosomatic healthcare for infertile women, men, and couples. In the first phase, at the start of medical care, and during the diagnostic process, the psychosomatic contributions to the care are focal psychodynamic techniques, which try to understand the specific infertility crisis in the context of the patient's profile and her personal situation. These sessions try to offer emotional catharsis and relief. In so-called 'systemic interventions', couples are helped to explore their individual desire for a child. They are encouraged to become aware of their family background, and of gender differences, in order to give them a better understanding of their unfulfilled wish for a child. This can involve structuring a three-generation genogram. During the therapeutic process, psychosomatic quality would be assured by a shared decision-making process, in which the benefit–risk analysis is carried out in consultation with the couple by taking into account the evidence-based information provided by the clinician, along with the personal values, and objectives that are to be reached by the couple. At this stage, couples may need behavioural interventions, and learn about applying stress reduction techniques and coping mechanisms, which could be used if required, during the management of their infertility.

Some couples may remain infertile after exhausting treatment options, and they have to deal with the decision to stop treatment without parenting the desired child. This may need specialised grief counselling. Grief counselling includes sharing the mourning process with them, being

involved with their emotional reactions, accepting any losses, and building up a new perspective for these couples. It is also important to detect pathological grief reactions, and the conversion of grief or reactive depression to a depressive disorder or major depression.

Psychosomatic-oriented sexual counselling First, the diagnosis of the sexual dysfunction is established in both partners and any specific problems identified such as those related to desire, arousal, orgasm, and/or pain. Next, a biopsychosocial diagnostic work-up is carried out to evaluate possible biological, particularly endocrinological factors, individualised psychological factors, and relationship factors that may contribute to the sexual problem. The therapeutic interventions in this field comprise both medical interventions and couple therapy.

Treatment of psychiatric comorbidity Specialised treatment is also indicated when psychiatric comorbidity is present. Typical psychiatric comorbidities are depression, anxiety disorders, and personality disorders, although the existence of the latter is controversial (see Chapter 4). Good clinical practice should focus on psychotherapy (cognitive psychodynamic), with the addition of psychopharmacology such as prescribing antidepressants, as necessary.

Implementing age-related psychosomatic management of endometriosis

Endometriosis may be associated with a woman from adolescence until her menopause. In adolescence, usually dysmenorrhoea and pain lead the teenager to seek medical advice. Non-steroidal anti-inflammatory drugs can be prescribed for pain relief, but may be ineffective. Psycho-education, and cognitive therapy could help, followed by a consideration of hormonal treatments. At a later stage of her life, the unfulfilled wish for a child or persisting dyspareunia, may become the predominant concerns. Patients should then be guided towards the treatment of infertility and/or dyspareunia, and advised about stress reduction techniques. If endometriosis persists for years, patients often develop depression, anxiety, and/or sexual dysfunction; the relevant interventions should be available in a stepped-up care pathway. This can vary from continuous supportive psychotherapy with selection of the most appropriate drug regimen, or the provision of minimal invasive surgery. If less invasive treatments fail to provide symptomatic relief prior to the menopause, more aggressive surgery may be needed. Tailored major surgery involving the pelvic reproductive organs or adjacent organ systems should be discussed as a last resort. In all these age-related clinical situations, the most suitable biopsychosocial treatment option, as provided in a clinical psychosomatic healthcare establishment, should be offered. This would help provide effective relief of symptoms such as pelvic pain, and improve treatment outcomes for the infertile.

Conclusions

This chapter centres on complex health conditions related to the female reproductive system, which cause pain, both physical and emotional. It underscores appreciation of the subjective aspect of pain or the severity of a disease that is encountered in clinical practice. The importance of including the patient's perception of the severity of her illness, both at evaluation, and during treatment is emphasised. For most health conditions related to incontinence, sexual ill-health, infertility, pregnancy loss and pelvic pain, the disease can start in the reproductive organs but spread to other organ systems. Subsequently, neuropsychiatric sequelae with psychosomatic repercussions can occur. Endometriosis is exclusive in triggering many of these clinical manifestations, including pelvic pain, or in remaining symptomless. Its aetiopathogenesis is not yet entirely understood.

The responses to these health conditions have a primarily subjective aspect, which is personal to each patient. This results in an individualised biological, psychological, and social impact.

Providing patient-centred biopsychosocial healthcare limits harm from unnecessary polypharmacy and aggressive surgery, current in clinical practice. Specific individual presentations can be managed more efficiently by recognising their inherent uniqueness.

As such, tailored psychosomatic healthcare should be available for those affected, where feasible, and this merits further research.

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Chapter 7

Premenstrual disorders: luteal phase recurrent enigmatic conditions

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Introduction

Regular menstrual cycles offer a window into women's overall reproductive health. A majority of women from all cultures and socioeconomic levels, however, experience myriad symptoms during the days prior to menstruation, commonly known as premenstrual syndrome (PMS)—a discordance of manifestations involving mind and body. Symptoms and perceived discomfort levels of PMS vary from woman to woman and range from premenstrual molimina, considered within the normal range of physiological changes, to premenstrual dysphoric disorder (PMDD), a debilitating condition that interferes with daily activities and requires treatment [1,2]. The recent literature has addressed premenstrual disorders as PMS, PMDD, and PMS/PMDD; this chapter retains these terminologies when referring to the subject matter.

Although no clear consensus exists as to the underlying causes of PMS/PMDD, increasingly consistent research findings point to clinically relevant biopsychosocial factors that contribute to symptomatic expressions, which, if addressed, can lead to effective treatment options. Moreover, many questions about this controversial and inscrutable condition remain unanswered. This chapter reviews the current literature on PMS/PMDD and focuses on definition, diagnostic criteria, symptomatology, epidemiology, and aetiopathogenesis. Evidence-based recommendations regarding allopathic and alternative therapeutic modalities of PMS/PMDD are also discussed. The clinical importance of understanding the sufferer's perception of the complex symptomatology of PMS, which is an aberration of normal physiological functioning, is depicted in an anonymised vignette, which also highlights the need for developing resources to provide psychosomatic, patient-centred healthcare.

Historical correlates

The existence of clinically significant premenstrual symptoms has been acknowledged since antiquity. Hippocrates attributed a number of negative psychological and behavioural symptoms to retained menstrual blood or a collection of agitated blood seeking escape from the womb [3,4]. The ancient Greeks first used the term *hysteria* in reference to a belief that the uterus could wander around inside the body looking for a baby, causing mental illness that would subside upon menstruation [4,5]. At the time, it was believed that chlorosis, or so-called 'green sickness', resulted when the womb became congested with toxic blood, causing madness in unmarried women because they failed to fulfil their reproductive potential [4]. Victorian physicians recognised menstrual madness and ovarian mania, as well as the commonplace neurasthenia [6].

Eastern physicians have also observed premenstrual disorders for centuries. As early as the third century, the oldest Chinese practical medical textbook, *Shang han lun*, described the conditions of patients with premenstrual disorder: 'Women appear to have unusual conditions in the premenstrual phase while experiencing various psychosomatic symptoms including lower abdominal bloating and discomfort, which might be caused by 'oketsu' (blood stagnation) syndrome. However, they are free of the symptoms after bleeding'. In addition, *tokaku-joki-to (tao-hechengqi-tang)*, a type of Kampo medicine for overcoming blood stagnation or stasis, was recommended as a treatment for premenstrual discomfort [7].

In the modern era, the first description of the premenstrual phenomenon in the English-language medical literature appeared in the *Archives of Neurology and Psychiatry* in 1931. Frank used the term *premenstrual tension* to describe a series of 15 women who experienced recurring seizures, other medical conditions, mood symptoms, and/or increased sex drive premenstrually [8]. In 1953, Greene and Dalton broadened the definition to *premenstrual syndrome* or PMS, thereby giving recognition to the wider range of symptoms [9]. Dalton's writings captured the attention of not only physicians but also the lay press, thus initiating a public discussion of PMS as a common disorder in women. A severe debilitating form of PMS was originally called *late luteal phase dysphoric disorder* by the American Psychiatric Association (APA), and later termed *premenstrual dysphoric disorder*, or PMDD [10].

Diagnosis

Diagnostic criteria of premenstrual disorders

The literature contains no consensus on which specific combination of physical findings, biological markers, or laboratory tests are obligatory in reaching a diagnosis of premenstrual disorders. This can be confusing to the practising clinician and the researcher but a clear separation of concomitant premenstrual symptoms may not be possible clinically, and biopsychosocial symptoms may overlap. Thus, various professional organisations, including the American College of Obstetricians and Gynecologists (ACOG) [11], the Royal College of Obstetricians and Gynaecologists (RCOG) [12], and the American Psychiatric Association (APA) [13] have published diagnostic guidelines for PMS and PMDD, emphasising the type, periodicity, and severity of symptoms. Most women experiencing regular ovulatory menstrual cycles can identify one or more premenstrual symptoms, including breast tenderness, pelvic heaviness or bloating, and food cravings. The symptom complex, which neither distresses the woman nor interferes with daily functioning, does not satisfy the criteria required for a diagnosis of PMS. It signals impending normal menstruation, which is categorised within the sphere of premenstrual molimina (subclinical levels of premenstrual symptomatology) [1,2].

It has been suggested that the term *PMS* should be reserved for a more severe constellation of physical, psychological, and behavioural symptoms that lead to periodic interference with day-to-day activities, and interpersonal relationships sufficient to diminish the quality-of-life of the sufferer [1,2]. The ACOG updated its *Guidelines for Women's Health Care* containing the diagnostic criteria of PMS [11], based on an earlier publication by Mortola et al. [14]. These authors had first noted the distinction between endogenous depression and depressive episodes, which occurred only during the luteal phase of cycles in women with PMS.

As Box 7.1 depicts, only those clinical cases where the symptoms engender identifiable dysfunction in social, academic, or work performance merit a diagnosis of PMS. The identifiable

Box 7.1 ACOG diagnostic criteria for premenstrual syndrome [11]

Premenstrual syndrome can be diagnosed if the patient reports at least one of the following affective and somatic symptoms during the five days before menses in each of the three prior menstrual cycles:

Affective	Somatic
Depression	Breast tenderness or swelling
Angry outburst	Abdominal bloating
Irritability	Headache
Anxiety	Joint or muscle pain
Confusion	Weight gain
Social withdrawal	Swelling of extremities

- The symptoms are relieved within four days of the onset of menses, without recurrence until at least cycle day 13.
- The symptoms are present in the absence of any pharmacological therapy, hormone ingestion, or drug or alcohol use.
- The symptoms occur reproducibly during two cycles of prospective recording.
- The patient exhibits identifiable dysfunction in social, academic, or work performance.

American College of Obstetricians and Gynecologists (ACOG). Premenstrual syndrome. Guidelines for Women's Health Care. A Resource Manual, Fourth Edition. Washington, DC, ACOG; 2014. pp.607–610.

dysfunction includes marital discord or relationship problems, impaired parenting, social isolation, legal disputes, school- or work-related problems, such as poor performance or attendance and tardiness, seeking medication for somatic complaints, and suicidal ideation [14].
The APA has established criteria (Box 7.2) for the diagnosis of PMDD [13] in the *Diagnostic and Statistical Manual of Mental Disorders,* 5th edn. (DSM-5).

After years of debate about whether PMDD should be categorised as a distinct psychiatric condition, a sizeable section of the medical fraternity has acknowledged the association of the menstrual cycle with psychiatric disorders [2]. While the relationship between PMS and PMDD remains unclear, PMDD reflects more severe mental symptoms, and potentially leads some women, to a higher level of functional impairment with a diminished quality-of-life [13].

An international multidisciplinary group of experts—the International Society of Premenstrual Disorders (ISPMD)—convened in Montreal in 2008, to review the definitions and diagnostic criteria for premenstrual disorders (PMDs). Table 7.1 outlines a classification consensus from this meeting [10,15] when the group categorised PMDs as *Core PMD* or *Variants of PMDs*. The characteristics of Core PMD do not differ from those criteria of PMS and PMDD described in the relevant guidelines of the ACOG, RCOG, and DSM-5.

Box 7.2 DSM-5 diagnostic criteria for premenstrual dysphoric disorder [2,13]

Timing of symptoms

A. In the majority of menstrual cycles, at least five symptoms must be present in the final week before the onset of menses, start to *improve* within a few days after the onset of menses, and become *minimal* or absent in the week postmenses.

Symptoms

B. One (or more) of the following symptoms must be present:

1. Marked affective lability (e.g. mood swings, feeling suddenly sad, or tearful, or increased sensitivity to rejection).
2. Marked irritability or anger or increased interpersonal conflicts.
3. Marked depressed mood, feelings of hopelessness, or self-deprecating thoughts.
4. Marked anxiety, tension, and/or feelings of being keyed up or on edge.

C. One (or more) of the following symptoms must additionally be present, to reach a total of *five* symptoms when combined with symptoms from Criterion B above.

1. Decreased interest in usual activities (e.g. work, school, friends, hobbies).
2. Subjective difficulty in concentration.
3. Lethargy, easy fatiguability, or marked lack of energy.
4. Marked change in appetite, overeating, or specific food cravings.
5. Hypersomnia or insomnia.
6. A sense of being overwhelmed or out of control.
7. Physical symptoms such as breast tenderness or swelling, joint or muscle pain, a sensation of 'bloating', or weight gain.

Note: The symptoms in Criteria A–C must have been met for most menstrual cycles that occurred in the preceding year.

Severity

D. The symptoms are associated with clinically significant distress or interference with work, school, usual social activities, or relationships with others (e.g. avoidance of social activities, decreased productivity and efficiency at work, school, or home).

Consider other psychiatric disorders

E. The disturbance is not merely an exacerbation of the symptoms of another disorder, such as major depressive disorder, panic disorder, persistent depressive disorder (dysthymia), or a personality disorder (although it may co-occur with any of these disorders).

Confirmation of the disorder

F. Criterion A should be confirmed by prospective daily ratings during at least two symptomatic cycles. (Note: The diagnosis may be made provisionally prior to this confirmation.)

Exclude other medical explanation (G)

Table 7.1 The classification of premenstrual disorders [10,15]

Premenstrual disorder category	Characteristics
Core premenstrual disorder (Core PMD)*	
	Symptoms occur in ovulatory cycles
	Symptoms are not specified—they may be somatic and/or psychological
	The number of symptoms is not specified
	Symptoms are absent after menstruation and before ovulation
	Symptoms recur in the luteal phase
	Symptoms must be prospectively rated (two cycles minimum)
	Symptoms must cause significant impairment (work, school, social activities, hobbies, interpersonal relationships, distress)
Variants of PMDs	
Premenstrual exacerbation	Symptoms of an underlying psychological, somatic, or medical disorder significantly worsen premenstrually
PMD due to non-ovulatory ovarian activity (rare)	Symptoms result from ovarian activity other than those of ovulation
Progestogen-induced PMD[†]	Symptoms result from exogenous progestogen administration
PMD with absent menstruation	Symptoms arise from continued ovarian activity even though menstruation has been suppressed

*Core premenstrual disorder (Core PMD) can be subdivided into: (1) predominantly somatic symptoms; (2) predominantly psychological symptoms; or (3) mixed somatic and psychological symptoms. A subgroup of women with predominantly psychological symptoms, with or without somatic symptoms, may also fulfil DSM-5 criteria for premenstrual dysphoric disorder (PMDD).

[†]Onset of symptoms after initiation of progestogen treatment.

As Table 7.1 indicates, ovulation clearly underlies the pathogenesis of Core PMD, with symptoms appearing during the luteal phase and resolving by the end of menstruation with a symptom-free week in the follicular phase [15]. The consensus definition of Core PMD emphasises the fact that the type of symptoms (somatic or psychological), and the number of symptoms are not specific criteria for identifying this health condition; rather, the severity (symptoms must cause impairment), timing (linkage with the luteal phase), and the need for prospective recording are of paramount importance [10,15,16]. That said, the diagnosis is based on the woman's perception of her premenstrual, biopsychosocial symptoms, which vary between menstrual cycles, and being subjective, pose a diagnostic challenge.

Differential diagnosis

Differential diagnosis is essential in evaluating a woman for a premenstrual disorder, since other underlying conditions may present similar symptoms to those of PMS and PMDD. Most chronic psychiatric or medical conditions are apparent throughout the menstrual cycle. Similarly, many conditions are subject to premenstrual or menstrual exacerbation, termed *menstrual magnification*, in which the menstrual cycle triggers or increases the severity of the manifestations.

Table 7.2 summarises possible disorders and conditions in the differential diagnosis of PMDs. Only when symptoms are absent during the postmenstrual phase of the menstrual cycle should PMS or PMDD be considered [16–19].

Table 7.2 Common conditions in the differential diagnosis of premenstrual disorders [16–19]

Psychiatric disorders	Medical disorders/ conditions	Gynaecological conditions	Psychosocial spectrum
Chronic depression	Anaemia	Dysmenorrhoea	Past history of sexual abuse
Major depressive episodes	Autoimmune diseases	Endometriosis	Past, present, or current domestic violence
Bipolar disorder	Chronic fatigue syndrome	Chronic pelvic pain	
Dysthymia	Collagen vascular diseases	Polycystic ovaries	
Generalised anxiety disorder	Diabetes	Perimenopausal symptoms	
Panic disorder	Hypothyroidism	Adverse effects of hormonal contraceptives	
Personality disorder	Migraines		
Somatoform disorder	Irritable bowel syndrome		
Substance abuse	Interstitial cystitis		
Attention deficit hyperactivity disorder	Fibromyalgia		
	Connective tissue and rheumatological disorders		
	Allergies		
	Seizure disorders, epilepsy		
	Eating disorders (anorexia or bulimia)		

Diagnostic instruments

Since the severity of PMS is in-keeping with other painful and/or emotional states, that are largely described subjectively, its evaluation is greatly influenced by the individual's perception, personality, tolerance, and what in their assessment would constitute as being 'severe' [18]. As to the quantification of the severity, the US National Institute of Mental Health (NIMH) suggested a 30% increase in the intensity of prospectively measured symptoms from the follicular phase (days 5–10 at the start of the menstrual cycle) to the late luteal phase (the six-day interval before the onset of menses), to diagnose PMS and PMDD [1,17]. Other clinicians consider a 50–75% within-cycle increase in the severity of symptoms from a baseline score during the follicular phase to the luteal phase as a prerequisite for diagnosing PMDD, and instituting psychopharmacological treatment [20]. The within-cycle percentage change is calculated by subtracting the follicular from the luteal score, then dividing it by the follicular score, and multiplying by 100.

The Menstrual Distress Questionnaire is one of the earliest validated tools used to identify and assess the severity of premenstrual symptoms [21]. Since then, various assessment tools, including computer-aided and web-based instruments, have been introduced [1]. Some of the instruments for the clinical setting were developed to determine the presence or absence

of PMS/PMDD in a retrospective fashion, while others were designed to measure symptoms prospectively. In order to achieve a reliable diagnosis, prospective daily documentation for at least two menstrual cycles are purported to accurately determine the cyclicity of the symptoms because of the intrapersonal variability in the pattern of symptoms between menstrual cycles. If a discrepancy occurs between two menstrual cycles, a third rating cycle is advised. Any calendar used for this purpose should allow for a recording of information on four key items: the number of symptoms, their severity, the timing in relation to the menstrual cycle, and the baseline level of symptoms in the follicular phase [2]. The ISPMD has recommended the Daily Record of Severity of Problems (DRSP) as an easily accessible, well-validated prospective rating scale [20,22].

Nevertheless, prospective recording is not always promoted in clinical practice for various reasons, which includes a belief that it would be onerous for patients with limited adherence to the programme; it has proved unrealistic for large epidemiological studies [23]. In order to facilitate screening and determine who would benefit from daily prospective recording, a retrospective assessment, such as the Premenstrual Symptom Screening Tool (PSST) [24,25], can be used to make a preliminary diagnosis. Moreover, a retrospective symptom record, depends on the woman's memory and correlates poorly with nightly charting, unless the retrospective rating is performed on day one of menses [22]. Therefore, without prospective recording or careful contemporaneous documentation to overcome the limitations of retrospective records, accurate diagnosis can be hampered with premenstrual symptoms being mistaken for other conditions due to underlying psychiatric or psychological problems.

Epidemiology

A number of population-based epidemiological studies on the prevalence of PMS and PMDD have been carried out worldwide. Although research designs and methodology varied among the investigations, and most of them were based on retrospective rather than prospective recording, the outcomes have been reasonably congruent, suggesting that nearly 90% of women of reproductive age experience at least one cyclical premenstrual symptom [15,26].

The ACOG criteria are useful in the diagnosis of PMS, but the strict definition that includes daily-symptom recording has only been used in a few studies assessing the prevalence of PMS [26]. In a study by Dean et al. [27], a convenience sample of 436 women, aged 18–45 years, completed the DRSP for two menstrual cycles. A total of 28.7% of the women met the diagnostic criteria for PMS. In Steiner et al.'s study [24], the prevalence of PMS was 20.7% in a Canadian convenience sample of 508 women.

In another subset of women who fulfilled the strict inclusion criteria of PMDD using daily prospective symptom charting, severe and disabling premenstrual symptoms were present in 3–8% [26]. An assessment of published reports suggests a higher prevalence of clinically significant dysphoric premenstrual symptoms, with 13–18% of women of reproductive age having dysphoric symptoms that cause distress and functional impairment [28]. Nonetheless, despite being disabled by PMS, many women could lack just one symptom to meet the arbitrary five-symptom criteria required for confirming a diagnosis of PMDD [10,28]. This would give rise to a management dilemma, as although the diagnostic criteria to initiate the treatment of PMDD are not met, these distressed women would benefit from appropriate symptomatic relief.

The most severe premenstrual symptoms occur in those women who are in their 20s to mid-30s. Many report that these symptoms started when they were teenagers, and that they have sought

treatment after experiencing premenstrual symptoms for almost 10 years [1,16]. According to an international study of high-school girls using the PSST revised for adolescents, 8.3% experienced symptoms indicative of PMDD, and 21.3% reported symptoms suggestive of severe PMS [25].

Pregnancy offers relief from PMS but in some women, carries with it an increased risk of postpartum depression [23].

Presentation as biopsychosocial symptoms

The recent literature describes more than 200 symptoms of PMS and PMDD, ranging from mild symptoms to those severe enough to interfere with normal activities. Table 7.3 refers to review papers [26,29] that list common mood and behavioural symptoms of PMD.

The severity and frequency of symptoms experienced may differ between women. While some women experience symptoms for only a few days in each cycle, symptoms affect others for up to two weeks. Symptoms often substantially worsen six days before and peak about two days prior to the onset of menses [30]. The nature of the premenstrual experience, while personal to each woman, may fluctuate between menstrual cycles. Such inter- and intra-individual variations of symptom manifestations may result from changes in many aspects of homeostatic functioning during the menstrual cycle, and result in physical and psychological irregularities that alter behaviour [31]. Similarly, psychosocial and environmental factors could modify the expression of symptoms. High body-mass index [32], smoking [33], and perceived stress [34] also act as potential factors for the development of PMS.

Health-related quality-of-life and burden of illness

Health-related quality-of-life represents a crucial aspect of assessing the burden of PMS and PMDD. Yet, measuring the quality-of-life in women with PMS is difficult, as symptoms relate to subjective

Table 7.3 Common premenstrual symptoms [26,29]

Physical symptoms	Psychological and behavioural symptoms
Joint pain, muscle pain, back pain	Changes in appetite, overeating, or specific food cravings
Breast tenderness or pain	Fatigue, lethargy, or lack of energy
Cramps	Mood swings (e.g. feeling suddenly sad or crying, increased sensitivity to rejection)
Abdominal pain	Irritability
Abdominal swelling or bloating	Anger
Headaches	Sleep disturbances
Skin disorders	Restlessness
Weight gain	Poor concentration
Swelling of extremities (hands or feet, or both)	Social withdrawal
	Not in control
	Lack of interest in usual activities
	Loneliness
	Anxiety
	Depressed mood
	Confusion
	Tension
	Hopelessness

views as well as ratings of physical and mental health, interpersonal relationships, occupation, and a sense of well-being [23]. Since 2000, a series of studies using prospective diagnostic instruments for PMS and PMDD have attempted to quantify the impairment of the quality-of-life of sufferers and the economic impact of premenstrual disorders [27,35,36]. One of these studies, conducted at a large health establishment based in southern California, USA, evaluated a sample of women aged between 18 and 45 years, who were having regular menstrual cycles. Subjects who met the criteria for the diagnosis of PMS showed significantly higher absenteeism at work, and impairment in work productivity. Women with PMS also had significantly more days per month affected by strained relationships, as well as impairment of occupational, educational, and household activities [35]. Analysis of the economic impact on this group of women revealed the association with a diagnosis of PMS, and the statistically significant increase of US$59 per year in direct medical costs ($P<0.026$) for outpatient visits, laboratory tests, and radiology services. In addition, there was an increased expenditure of US$4,333 in indirect costs ($P<0.0001$), associated with decreased work productivity and missed work hours [36], when compared with women without PMS.

Heinemann et al. [37] conducted a prospective two-month, web-based observational study using the DRSP scale on a sample of 4032 women suspected of having PMS or PMDD recruited from 19 countries in North America, Latin America, Europe, Asia, and Australia. The study revealed that women with moderate-to-severe PMS or PMDD reported higher levels of work absenteeism, losses in work productivity, and impairment in the activities of daily living when compared with women who did not perceive any symptoms or had only mild symptoms. These observations were consistent across the different regions, but less pronounced in most Asian countries.

Premenstrual symptoms also affect the sufferer's families, and influence other aspects of their lives and relationships [38]. Marital relationships of women with PMDD are more impaired than those of women with repeated episodes of major depressive disorder [39]. Furthermore, evidence shows that women with PMDD can suffer an impairment as severe as that of women with chronic clinical depression, and a poorer luteal phase adjustment to social and leisure activities than women with other types of depression [23,28]. Female college students consume more alcohol during the week when there are severe symptoms of PMS compared with a week when they are symptom-free [40]. Non-fatal suicidal behaviour [41], and psychiatric admissions [42] also increase during the late luteal and early follicular phases when oestrogen levels are lowest. Such behaviour is manifest in those with PMS.

Personality and experience of traumatic events

De Berardis et al. [43] have shown an association of alexithymia with more severe premenstrual dysphoria. These authors have reported that alexithymic women with PMDD exhibited a significantly poorer self-evaluation of appearance, and body satisfaction than non-alexithymic women who had PMDD. Another study reported that 'Trait and State' anxiety correlates positively with premenstrual alterations [31]. Women with PMDD had greater novelty-seeking/impulsivity scores than did women with a major depressive disorder, suggesting a loss of impulse control as a potential diagnostic feature of PMDD [44].

Experience of traumatic events may be a crucial risk factor for PMS or PMDD [34]. According to Golding et al. [45], over 80% of women with histories of sexual abuse who sought treatment for PMS had not previously disclosed the abuse to healthcare providers. Sexual abuse, particularly during childhood, has lasting effects on multiple biological and psychological variables, including endocrine responses to stress and coping styles. These variables may ultimately contribute to a woman's risk of depression in adulthood. Girdler et al. demonstrated that significantly more women with PMDD had histories of sexual abuse, and a greater current-life stress than control subjects [46]. They also found that consistent with a history of trauma, women with

PMDD exhibited dysregulation of cardiovascular and neuroendocrine responses to laboratory stress.

Aetiopathogenesis

Emerging research has proposed many theoretical models to explain the aetiopathogenesis of PMS or PMDD. Furthermore, due to the complexities of its multiple biopsychosocial determinants, the causes of premenstrual conditions remain somewhat elusive.

Ovarian hormone fluctuation

There is a rise and fall of ovarian hormones after ovulation triggers symptoms of PMS or PMDD in women who are predisposed to these conditions [47]. In-keeping with this pathophysiological viewpoint, symptoms are absent during anovulatory cycles [48] and may disappear entirely with oophorectomy [49], or during treatment with ovulation inhibitors [50]. Furthermore, an ebb of progesterone levels in the late luteal phase may trigger premenstrual symptoms. Conversely, some women experience symptoms at the onset of ovulation, and during the early part of the luteal phase when progesterone levels are high. Thus, it cannot be concluded that oestradiol will augment progesterone-induced dysphoria or elicit similar symptoms *per se* [15]. Investigators have yet to confirm an abnormality of oestrogen, progesterone, or androgen production in women with PMS [47,51]. Nevertheless, unlike asymptomatic control women, women with PMS experienced a recurrence of symptoms of PMS when given a physiological dose of either oestrogen or progesterone after inducing ovarian suppression using a gonadotrophin-releasing hormone (GnRH) agonist [52]. These findings indicate that the dissimilarity between women with premenstrual disorders and those without such symptoms is not due to differences in the ovarian production of sex steroids. The difference between the two groups actually relates to an enhanced response to exposure or withdrawal of the circulating steroids [15], which even so, fall within the normal range for each phase of the menstrual cycle that these women experience.

An interaction between sex steroids and central neurotransmitters

Among the hypotheses advanced to explain premenstrual disorders, is that of an association between central neurotransmitters and sex steroids. Serotonin, a brain neurotransmitter, is clearly involved in mood and anxiety regulation, as well as modulation of appetite, sleep, circadian rhythm, and arousal [53]. Gonadal hormones may affect behaviour through their effects upon serotonergic transmission, as shown in studies with rodents [54] and non-human primates [55]. Given that mood and behavioural symptoms are hallmarks of PMS or PMDD and that there is a probable role of serotonin in modulating sex-drive, serotonin could also be involved in the pathophysiology of premenstrual disorders. Serotonergic antidepressants can influence symptoms of PMS or PMDD, although not all patients respond to the treatment [44,47]. Aberrations in serotonergic transmission are found in PMS and PMDD [56]. A positron emission tomography study reported strong inverse associations between worsening of cardinal symptoms of premenstrual dysphoria and brain serotonin precursor trapping [57].

Progesterone metabolises in the ovary and the brain to form the potent neuroactive steroids, allopregnanolone (3α-hydroxy-5α-pregnane-20-one) and pregnanolone (3α-hydroxy-5β-pregnane-20-one), which are positive allosteric modulators of the GABA neurotransmitter system in the brain [58]. GABA is the main inhibitory neurotransmitter in the brain. Using a similar mechanism to drugs such as benzodiazepines and barbiturates, allopregnanolone binds to the GABA(A) receptors, resulting in anxiolytic and anticonvulsant effects [59]. Several reports have suggested [47,60,61] that in patients with PMS, diminished levels of allopregnanolone or reduced

sensitivity to it, in addition to alterations in GABAergic transmission, could contribute to various mood symptoms, such as anxiety, irritability, and depression.

Studies have reported differences in beta-endorphin levels between the preovulatory and premenstrual phases in women diagnosed with PMS or PMDD [44,51]. Batra et al. [62] suggested that women with PMDD might have an increased sensitivity to cyclical changes of the excitatory neurotransmitter, glutamate. Cubeddu et al. [63] investigated plasma variations of brain-derived neurotrophic factor (BDNF) during the menstrual cycle, and demonstrated lower luteal BDNF levels among women with PMS compared with controls. This might result from an altered hormonal response, and may play a role in the onset of PMS-related symptoms.

Autonomic nervous system activity

The sympathetic and parasympathetic divisions of the autonomic nervous system function antagonistically, complementarily, and harmoniously, to play a crucial role in orchestrating human homeostasis, and in reflecting mind–body interaction. Instability, or even a slight disharmony of the autonomic nervous system, could therefore induce broadly-ranged psychophysiological phenomena, such as premenstrual symptomatology.

Studies have demonstrated notable differences in autonomic regulation between premenstrual symptomatic and asymptomatic women [1,64]. Figure 7.1 represents a typical record of heart-rate variability (HRV) spectral power in women participating as the Control, PMS, or PMDD groups [1]. No intramenstrual cycle differences in any of the parameters of HRV were found in the control group. In the PMS group, however, total power representing overall autonomic nervous system activity, and high frequency (HF) power reflecting parasympathetic nerve activity, significantly decreased in the late luteal phase when compared with the follicular phase. In the PMDD group, heart-rate fluctuations as well as all components of the power spectrum showed a marked reduction regardless of the stage of the menstrual cycle when compared with the other two groups.

These findings indicate that parasympathetic nervous system activity decreased in the symptomatic late luteal phase compared with the follicular phase in women with PMS. The study also suggested that physiological functioning in both divisions of the autonomic nervous system might be more depressed during the entire menstrual cycle when premenstrual symptoms become more severe, as seen in women suffering from PMDD. Despite the differences in experimental designs and methodology, studies with HRV power spectral analysis of women with PMS or PMDD have also identified signs of altered regulation of the autonomic nervous system [65,66]. The authors further investigated pathogenesis of premenstrual symptomatology with salivary chromogranin A (CgA)—a psychological stress marker associated with sympathetic nervous system activity [67]. Their findings have indicated that there is a significant increase in salivary CgA levels in the late-luteal phase in women experiencing a cluster of severe negative psychoemotional symptoms premenstrually.

Other physiological differences

Women with PMS commonly report somatic symptoms of breast tenderness, abdominal bloating, and fluid retention along with joint and muscle pain. However, to-date, it remains unclear whether such symptoms result from reduced tolerance to physical discomfort while in a dysphoric mood, or due to an alteration in the peripheral hormone-responsiveness of tissues [30,44]. Regarding a possible pathogenesis of the symptoms of fluid-retention, Rosenfeld et al. suggested that women with PMS have increased plasma fluid-regulatory hormones, and disturbed fluid distribution in tissues during the late luteal phase [68].

More variable thyroid indices occur in women susceptible to PMS and PMDD than in controls [30]. Women with PMS experience an alteration in the circadian rhythm, as do women with

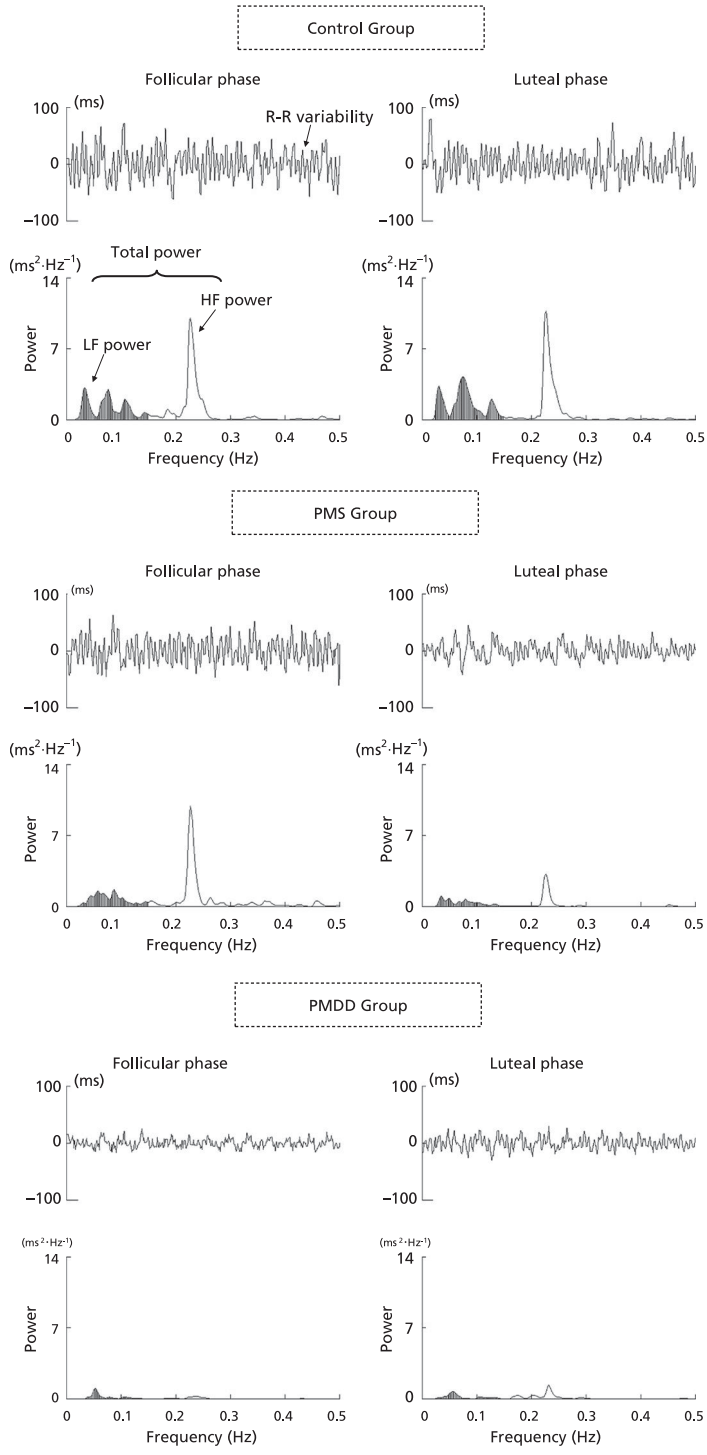

Figure 7.1 Examples of ECG R-R interval changes and corresponding power spectra during the follicular and late luteal phase for subjects in the Control, PMS, and PMDD groups. Low-frequency (LF) power (0.03–0.15 Hz); High-frequency (HF) power (0.15–0.5 Hz). [1]

Matsumoto T, Asakura H, Hayashi T. Biopsychosocial aspects of premenstrual syndrome and premenstrual dysphoric disorder. Gynecol Endocrinol 2013;29(1):67–73.

anxiety and mood disorders. Although absolute levels of hormones such as melatonin, cortisol, thyroid-stimulating hormone, and prolactin do not fluctuate, the timing of their excretion might be aberrant in women with PMS [30,44] when compared with those deemed not to be suffering from PMS.

A study investigating calcium and vitamin D metabolism during the menstrual cycle has suggested that alterations in calcium homeostasis may play a role in the genesis of symptoms in women with PMDD [69].

Treatment strategies

Clinicians and researchers have put forward many treatment strategies to alleviate symptoms of premenstrual disorders. Even effective treatments do not reduce the impact on all presenting symptoms to the same extent. Therefore, the treatment of PMS or PMDD, psychosomatic conditions, which correlate with biological cyclicity, should involve a tailored approach; one that is relevant to each woman's particular set of circumstances.

Non-pharmacological treatment options

Lifestyle modification

Lifestyle changes, recommended for all women experiencing premenstrual symptoms, should begin at the start of, and continue throughout the diagnostic process of, prospective symptom charting. In women considered to have mild symptoms, education about the condition, supportive counselling, and lifestyle measures, such as a healthy diet and regular exercise, may reduce the impact of symptoms so that they are not perceived as troublesome [2,10,29].

Modification of the habitual diet, such as by increasing the consumption of complex carbohydrates in those with a low intake, could enhance the transport of the serotonin precursor tryptophan into the brain, leading to a transient increase in the synthesis of this neurotransmitter, which can alleviate symptoms of PMS [30,31,70]. Soy isoflavones may also have a beneficial effect in reducing premenstrual symptoms [31,71]. Other helpful dietary recommendations, based on observation and theoretical rationale, suggest reduction in the consumption of caffeine, salt, and refined sugar [30,31].

A selection of four eligible intervention studies from a systematic review reported that participation in exercise reduces PMS, and other related symptomatology [72]. Although the studies were of low methodological quality, such lifestyle modifications can additionally lead to improvement in overall health. The efficacy of exercise may relate to the release of endorphins, thereby counteracting a possible decline in endorphin levels during the luteal phase that could engender symptoms of PMS.

Dietary supplements

A large randomised clinical trial demonstrated that 600 mg of calcium twice a day was superior to a placebo in improving premenstrual emotional and physical symptoms in 466 women who were prospectively confirmed as suffering from PMS [15]. The combination of calcium (1000 mg/day) and vitamin D (400 mg/day) has also been reported to decrease the severity of PMS, and is more effective than a placebo in doing so [73]. Supplemental magnesium (200–400 mg/day) may improve fluid retention and mood [17,31] but does not improve PMDD [74]. Pyridoxine (vitamin B6), a cofactor in the final stages of synthesis of serotonin and dopamine from tryptophan, reportedly reduces symptoms of premenstrual depression [17,75]; it is available over the counter. Caution should be exercised with self-medication, as high doses of pyridoxine (>100 mg/day) may result in neurotoxicity.

Herbal complementary therapy

Vitex agnus-castus (chasteberry), given in a dose of 20 mg/day, ranked superior to placebos by 50% or more in reducing various symptoms of PMS, including fullness of the breasts, irritability, alteration in mood, anger, and headaches [76]. The extract functions as a dopaminergic agonist that inhibits prolactin release thereby producing a beneficial effect. There is limited evidence that chasteberry has a comparable efficacy to fluoxetine. Fluoxetine is reportedly more effective for psychological symptoms, whereas the extract of chasteberry diminishes the severity of physical symptoms [77].

A small, double-blind, randomised, placebo-controlled trial has confirmed the effectiveness of the stigma of saffron, *Crocus sativus L.*, in treating PMS [78] when taken at a dose of 30 mg/day. According to a previous clinical study, saffron, through a serotonergic mechanism, exhibits an antidepressant effect when used in the treatment of women with mild to moderate depression [79]. Further research, in particular, a comparison with an active agent such as fluoxetine, will be needed to obtain further evidence of its beneficial effect. Use of other herbs or their extracts, such as Evening Primrose Oil, St John's Wort, or Ginkgo Biloba, as potential therapies for PMS or PMDD remain contentious. Insufficient therapeutic evidence [17,31,44,80] along with limited information on side-effects or drug interactions entail caution.

Kampo, traditional Japanese herbal medicine, has been frequently prescribed for PMS in Japan [81,82]. A clinical study by Kimura et al. [81] applied non-invasive pulse wave analysis to evaluate peripheral autonomic responses along with assessment of the elasticity of arteries. The results suggested that *Kami-shoyo-san* could induce vascular rejuvenation, which is an indication of improvement in the autonomic nervous disturbance in patients with PMS. Premenstrual discomfort was also reduced significantly. Although clinical evidence is scarce, *Kampo* as an alternative approach, may have therapeutic efficacy on complex health conditions such as premenstrual disorders and this deserves further research.

Psychological interventions

Cognitive-behavioural therapy (CBT) may be useful for managing PMS. CBT refers to a type of psychotherapy that focuses on modifying problematic thoughts, emotions, and behaviours. The treatment goals of CBT are to identify and restructure learned maladaptive thoughts, and behavioural patterns. This can help individuals evaluate situations more realistically, and cope with internal and external stressful triggers, thereby leading to improved performance [83]. Kirkby concluded that improving coping skills by cognitive-behavioural therapy can reduce the negative effects of PMS, and that these reductions can be sustained over time [84]. A randomised controlled trial by Blake and colleagues evaluated the effectiveness of cognitive therapy as a psychological treatment for PMS, by comparing it with a control group on a waiting list for treatment of PMS who did not have CBT [85]. These authors reported that CBT substantially improved PMS when compared with those on the waiting list who did not receive treatment.

Another trial comparing CBT to a serotonergic antidepressant, fluoxetine, found that both proved equally effective in treating PMDD. Although fluoxetine provided a more rapid improvement, CBT was associated with better maintenance of the beneficial effects of treatment at the one-year follow-up visit. Combining CBT and fluoxetine did not provide additional clinical benefit [86]. These findings suggest that CBT could provide an effective psychotherapeutic intervention for premenstrual disorders. Further clinical trials of higher methodological quality will be required to verify the efficacy of this form of management.

Other complementary therapies

Bright-light therapy, which works by possible alterations in the circadian rhythm, may be effective for PMS and PMDD [44]. Nonetheless, it remains unclear how long the potential therapeutic effects persist. Besides, there have been concerns about its safety, as retinopathy may occur as a side-effect of the treatment. Despite a paucity of clinical evidence, other alternative treatments such as aromatherapy [87], reflexology [88], massage therapy [89], biofeedback [90], and acupuncture [91] may enhance well-being by reducing the negative impact of premenstrual symptoms.

Pharmacological treatment options

Current pharmacological treatment options for PMS and PMDD include serotonergic antidepressants, anxiolytics, hormonal interventions, non-steroidal anti-inflammatory drugs, and spironolactone [30,44,92,93]. This section will briefly discuss the therapeutic efficacy of serotonergic antidepressants, and hormonal interventions in managing premenstrual disorders.

Serotonin reuptake and selective serotonin and noradrenaline reuptake inhibitors

Serotonin reuptake inhibitors (SRIs) represent the drugs of choice, and are considered as first-line treatment for severe PMS and PMDD [92,94]. Selective SRIs (SSRIs) such as fluoxetine, paroxetine, sertraline, citalopram, and escitalopram, reportedly minimise both mood and somatic symptoms, while improving quality-of-life and social functioning [23,44]. According to other studies [19,92], the serotonergic tricyclic antidepressant, clomipramine, and the serotonin and noradrenaline reuptake inhibitor venlafaxine, also have clinical efficacy in reducing the symptoms of premenstrual disorders.

The beneficial effects of SRIs upon symptoms of PMS or PMDD occur rapidly in comparison with their slower action on major depressive disorders. The rapid onset of action of SRIs on PMS, and PMDD renders intermittent luteal-phase dosing (during the last 14 days of the menstrual cycle) a feasible alternative to continuous therapy [92,94–99] but sample sizes have been small in these studies. Even briefer periods of active SSRI treatment for shorter periods—symptom-onset dosing—are reportedly more effective than placebos [98] but sample sizes have been small in these studies. Clinical experience indicates that most but not all women with PMS and PMDD prefer half-cycle, intermittent treatment dosing, rather than continuous treatment. Other studies [30,44,94,97] have concluded that intermittent luteal-phase dosing regimens have less effect on somatic symptoms than on mood symptoms. Hence, somatic symptoms may warrant the continuous treatment regime.

Side-effects of SRIs, such as nausea, headache, fatigue, dizziness, insomnia, and gastrointestinal disturbances can occur during treatment [23,44,99] with adolescents at increased risk of suicide [100]. Sexual side-effects, which include reduced libido and anorgasmia, may persist for the duration of the treatment, and any benefits that accrue do not carry over during the drug-free intervals of intermittent treatment [30,44]. Although SRIs are not addictive, symptoms may recur when medications are discontinued abruptly and tolerance has been observed. Rebound of symptoms is rarely seen with intermittent SRI treatment [44,98] but tolerance to such medication needs further study.

Hormonal interventions

Prescribing combined oral contraceptives (OCs) as a therapeutic option for PMS has been advocated, despite a lack of supporting evidence. Since OCs prevent ovulation, it is plausible that they would decrease premenstrual symptoms if these were related to the hormonal fluctuations with ovulation. A clinical study of 658 women using first generation OCs, reported deterioration of mood in 16.3% when using the pill, while only 12.3% reported an improvement in mood premenstrually. The majority, 71.4%, stated no change related to the usage of OCs [101]. The reason

for the lack of efficacy remains unknown. An explanation could be that the traditional 21/7 OC regimen of 21 active pills followed by seven inactive pills would allow for continued hormonal fluctuations, which could prevent symptomatic relief. The progestins in most hormonal contraceptives are derived from testosterone, and these or the higher dose of oestrogens in some OCs may generate symptoms that mimic PMS such as, irritability, mood lability, and fluid retention. Experiencing these side-effects of OCs [23] while receiving treatment for PMS would thus reduce their efficacy in providing relief from these very symptoms.

Drospirenone, a synthetic progestin derived from spironolactone that is also used for the treatment of PMS/PMDD, has antiandrogenic and antimineralocorticoid properties. Its long half-life when combined with a dosing regimen of 24 active followed by four inactive pills in each cycle, leads to better hormonal suppression and symptom control [102]. Randomised controlled trials have reported that this new, fourth generation OC, containing a low dose of oestrogen (0.02 mg of ethinyl oestradiol) with 3 mg of drospirenone in a 24/4 regimen, is effective in 60% of women with PMDD [102]. When the two OCs with the same dose of drospirenone but containing either 0.02 mg or 0.03 mg of ethinyl oestradiol were compared, women taking the lower dosage of ethinyl oestradiol showed a greater improvement in premenstrual mood [103]; the OC with the lower oestrogen dose (0.02 mg) is not available as a prescription drug in the UK. Generally, side-effects lead to discontinuation of OCs in up to 20% of women, and these include breakthrough bleeding, nausea, moodiness, breast tenderness, headaches, decreased libido, and weight gain [104]. Additionally, drospirenone has been associated with thromboembolism [105], and its safety questioned because of related fatalities in North America; this dictates caution in prescribing.

Gonadotrophin-releasing hormone agonists (GnRH) abolish ovarian cycles leading to medical oophorectomy by downregulating the production of gonadotrophins, oestradiol, and progesterone. These agents have been found to be effective for the treatment of PMS, but, the side-effects of oestrogen deficiency and long-term adverse effects—even with the continuous administration of oestrogen and progesterone or spironolactone as add-back therapy—make this approach the last level of drug therapy on offer [12,23,50] for symptom management.

Surgical removal of the uterus (hysterectomy), tubes and ovaries (bilateral salpingo-oophorectomy) as an invasive option for treating PMS [12] has been considered as satisfactory [49]. Even so, the sparse evidence about psychosomatic symptomatology and biopsychosocial sequelae, besides a premature menopause due to the surgery needs careful consideration and merits research.

A vignette of a young adult with PMS, who desperately sought surgical treatment, even if it would destroy her femininity, is presented in Table 7.4 to illustrate the complexity of providing appropriate patient-centred care.

Table 7.4

	Vignette 1: A gynaecological outpatient department (GOPD) attender: British Caucasian with PMS
Presentation and management	*Ms AW, 20 years old, university student, recently moved in with a male friend* ◆ Ms AW was on a follow-up GOPD visit to discuss further management of her PMS ◆ She was anxious and afraid that her PMS would never be cured, as every medical treatment so far given had failed to do so ◆ She had experienced her usual painful menstrual bleeding five days before ◆ Premenstrually, she often suffered from bloating, breast tenderness, muscle cramps, irritability, headaches, and sometimes, a low mood ◆ Her last medication of a gonadotrophin analogue with add-back therapy, which she opted for, was stopped after three months due to her headaches, and low mood

Table 7.4 Continued

	Vignette 1: A gynaecological outpatient department (GOPD) attender: British Caucasian with PMS
	At her last assessment at the GOPD she reiterated: ◆ A long history of premenstrual symptoms ◆ Her cycles were regular with periods every 28 days, occasional dysmenorrhoea, and menorrhagia but no intermenstrual or postcoital bleeding ◆ Her recurrent premenstrual symptoms subsided with the onset of her periods ◆ At her first visit to the gynaecologist she had confirmed PMS based on prospective charting of symptoms, and a pelvic examination at the time was unremarkable ◆ The PMS became worse during the last year, despite treatment for the past four years ◆ Her treatment over four years included oral analgesia and vitamin B6 along with second generation OCs or continuous dose SSRI and, lastly, GnRH with add-back therapy ◆ In addition, she had a lower abdominal ache intermenstrually with superficial dyspareunia while in this new relationship ◆ She was non-pregnant ◆ Her general observations were normal other than a slight tachycardia ◆ She looked underweight (BMI 20), and a physical examination revealed a soft, non-tender abdomen with normal bowel sounds ◆ She consented to a pelvic examination and although tense, accepted a well-lubricated nulliparous speculum examination to obtain bacteriological specimens ◆ After arranging for a pelvic ultrasound, further management was discussed ◆ She was persuaded to try the fourth generation OC, Yasmin, which was prescribed along with oral analgesia and a follow-up appointment was given ◆ At this current follow-up assessment she appeared very anxious and agitated ◆ Her investigations and ultrasound scan were normal but she was not reassured ◆ She had heard of 'clots with Yasmin' and did not want to continue taking it as during the last three cycles she had felt 'as low as before' with headaches ◆ She could not attend college with her PMS as she did not feel like getting out of bed, her relationship was suffering, and she wanted to self-harm ◆ She had had 'enough of tablets', did not want 'drug patches' and having read about it, wanted 'the whole lot out' (removal of reproductive organs) to cure her ◆ She refused to be referred to a psychiatrist as she said that she was 'not a nutter' ◆ She was referred to a gynaecologist with psychosomatic awareness (Ob/Gyn-Psyc) who persuaded her not to go for the surgical option but try other options ◆ She accepted to try CBT but there was a long waiting period for this ◆ She said that she felt better after the consultation, and accepted an intermittent SSRI to be taken during the luteal phase 'only while she waited' for her CBT ◆ At the next follow-up appointment with the Ob/Gyn-Psyc she said that she felt 'somewhat better', was attending college but her relationship was still strained ◆ The Ob/Gyn-Psyc medic apologised as other treatments which Ms AW requested, including herbal, were unavailable at the hospital, but psychosexual advice was given ◆ At another assessment by the Ob/Gyn-Psyc she was less anxious, and coping better with her PMS but sought advice about trying evening primrose oil (EPO) ◆ She had started getting CBT and wanted to come off the antidepressant 'drug' so the process of weaning off the SSRI was begun, and advice about EPO given ◆ A final visit for assessment by the Ob/Gyn-Psyc showed her to be coping with her PMS, and her relationship with her male friend was much improved ◆ She accepted to be discharged back to her GP for further care with the option to be referred back to the Ob/Gyn-Psyc if the need arose again

(*continued*)

Table 7.4 Continued

	Vignette 1: A gynaecological outpatient department (GOPD) attender: British Caucasian with PMS
Psychosocial initiating, maintaining, and alleviating factors	◆ Ms AW's perception of her premenstrual symptoms was influenced by her anxiety ◆ Ms AW's mother, a head-teacher, seemed to convey her worry about the PM symptoms to her; although well-meaning, Ms AW's mother was domineering ◆ Her mother's great concern suggesting that there was something grossly wrong with Ms AW, despite her protests that she was coping 'OK', exacerbated her PMS ◆ Ms AW was timid and the sudden break with a previous boyfriend caused distress with resurgence of her premenstrual symptoms, and disillusionment with treatment ◆ The change in consultation to a psychosomatic approach by the Ob/Gyn-Psyc stopped her from demanding a hysterectomy and oophorectomy or self-harming
Impact on the healthcare system	◆ Her long history of PMS and a docile personality with an overbearing mother made her perception of symptoms worse, and she sought different forms of healthcare management ◆ Repeat appointments starting with the GP, and then hospital consultations were time-consuming, but necessary, to prevent extreme outcomes such as self-harm ◆ She would need management of her PMS until she was able to cope with her premenstrual symptoms, and carry out her daily commitments satisfactorily ◆ Additional costs for biopsychosocial support would continue while she improved her coping skills or if she suffered a relapse requiring psychosomatic hospital care

Applying the psychosomatic perspective in managing PMS before it is entrenched, could help reduce its morbidity. Whether PMS evolved as an evolutionary advantage and should not be stigmatised by health professionals or society, is a perspective that needs more investigation [106].

Conclusions

With the trend toward younger menarche, safer pregnancies, a lower birth rate, and longer lives, women spend a greater proportion of their lives menstruating than they did during the earlier periods of history. Regular menstrual cycles are purported to indicate that the woman has normal reproductive health. Furthermore, regardless of nationality, every woman who ovulates is aware of the menstrual cycle's influence on the physical, psychological, and social aspects of her life but may not be vocal about it. Women from certain culturally diverse backgrounds may be oblivious of the true impact of their menstrual-related changes, and relatively few among them will seek medical treatment, even if symptomatic. Moreover, medical treatment can leave some women dissatisfied, particularly if the side-effects of the drugs are worse than any relief from the medication.

Vignette 1 (Table 7.4) has brought into focus the clinical implication of PMD and the extent to which the sufferer is willing to go to obtain symptomatic relief. Ms AW was distressed with both physical and psychological manifestations of PMS. She coped better with complementary and pharmacological treatments until there was a biopsychosocial exacerbation. She then demanded a hysterectomy, and oophorectomy even if it was a non-reversible drastic measure, with an increased risk of life-long negative consequences. She did not have access to several non-pharmacological treatments, as they were not on offer in the management plan provided by the hospital she attended. This indicates a need for developing health resources to implement a stepped care-pathway for the relief of the psychosomatic symptoms of PMS; ideally such a pathway should enable the patient to access all evidence-based interventions available globally.

As described in this chapter, premenstrual discomfort, PMS and PMDD, remain enigmatic health conditions. Research continues to unravel the aetiopathogenesis of this sophisticated, interdependent fluctuation of the ovarian hormones, oestrogen and progesterone, throughout the menstrual cycle, which interact with the central nervous, autonomic nervous, endocrine, and immune systems. This affects the sufferer's physiological functioning, mood and emotions, vulnerability to stress, sensory processing, neurocognitive function, and more. Future multidirectional and interdisciplinary approaches may reveal the underlying mechanisms of premenstrual disorders with their intricate biopsychosocial associations. Such approaches will contribute to more detailed national and international diagnostic criteria and, ultimately, will aid in establishing treatment modalities with greater clinical efficacy. All this could be translated to a management strategy for PMS that is accessible to any sufferer worldwide.

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Chapter 8

Women's psychosomatic health promotion and the biopsychosociocultural nexus

Mira Lal

Introduction

The importance of women's psychosomatic health is under-recognised, and deserves promotion. Prevention and early management of certain disease conditions resulting from biological, psychological, and social factors that intermingle with cultural influences to generate these illnesses, are contemporary topics. In the modern healthcare environment, professionals managing these health conditions have to compete for resources, and in addition, practise economically sound management. Cancer and obesity are the topics of interest selected for examination here. Confronting these arguably avoidable illnesses in money-stretched healthcare systems are veritable challenges. Hence, their prevention and early management seem a judicious usage of any nation's healthcare resources, and are worthy of discussion.

Prevention of diseases is learnt in the preclinical phase of the undergraduate medical curriculum but is often disregarded during disease management by the busy clinician who treats ailments on a day-to-day basis. Prevention of diseases is emphasised in 'Preventive Medicine'—the branch of medical science, which deals with methods (such as vaccination) of preventing the occurrence of disease [1]; it is rationally coupled with 'Social Medicine' in preclinical teaching, as both are interrelated. Prevention of diseases can be 'primary', such as stopping smoking or being vaccinated to help prevent cancer; 'secondary', such as screening for cancer; or 'tertiary', when referring to disease management before complications develop. Many medical practitioners who are busy with the treatment of diseases may marginalise measures to prevent it, if the health condition does not fall within their daily remit. Nevertheless, the rising costs of treatment are driving up the need for disease prevention [2]. The Commonwealth Fund estimated that the reduction of obesity and smoking would reduce healthcare expenditure by US$474 billion over 10 years [3], thereby justifying a business case for prevention.

When discussing the prevention of gynaecological cancer and obesity in women in this chapter, the advantages/disadvantages of primary or secondary prevention rather than tertiary prevention or treatment of disease will be underscored. While mind–body interactions form the basis of the psychosomatic origins of diseases (see Chapter 1) interpersonal and social interactions initiate or propagate ill-health through neuroendocrinological responses, which are further modulated by genetic and environmental factors. Therefore, the role of biopsychosociocultural factors that maintain women's psychosomatic interactions, whether linked to cancer or to obesity, need to be identified and deciphered to enable prevention of associated ill-health.

The global disease burden of cancer

The incidence of any disease, including cancer, is the number of new cases occurring within a certain period, expressed as an absolute number of cases per year or as a rate per 100 000 persons per year. With regards to cancer, the latter, which is an estimate of the average risk of developing cancer per year, is used for comparisons between countries or geographical areas, or within populations over time [4]. Cancer or malignancy occurs when cells of a specific part of the body multiply uncontrollably to form a tumour with the potential to spread to other parts of the body, although not all tumours are malignant. Most malignancies are silent initially but can present as a lump, abnormal bleeding, a change in bowel function, fever, changes to the skin or unexplained weight loss; some of these symptoms can be caused by other factors that are benign conditions, which can confound and delay the diagnosis of cancer. Screening tests can detect certain cancers whether silent or symptomatic. According to global statistics published in 2015, a new cancer occurred in 14.1 million in 2012, and caused 8.2 million deaths, with breast cancer being the most common in females, and cervical cancer being the second most common [4,5]. The global incidence of cervical cancer in 2012 [4] was 493 243, thus the second most common cancer in low–middle-income countries but the 11th most common cancer in high income countries, where there was a fall in the prevalence rate within the last decade due to the uptake of the cervical cancer screening programme.

Among the gynaecological cancers, the prevention and early treatment of precancerous lesions of the cervix will be the main focus of this chapter, while the less common vaginal and vulval premalignancies will be addressed only briefly.

Cervical intraepithelial neoplasia: terminologies/definitions and the aetiopathology

Cervical cancer is preceded by a precancerous condition referred to as cervical intraepithelial neoplasia or CIN. CIN represents a condition where the cells of the cervical epithelium undergo malignant changes but the basement membrane remains intact; the disease is localised. Another term used since the nineteenth century is carcinoma-*in-situ* (CIS), where neoplastic cells replace the normal cells of the cervical epithelium [5] but there is no breach in the basement membrane. 'Dysplasia' is a term previously used to categorise cervical epithelial cells which have undergone premalignant changes but to a lesser degree than CIS. CIN is divided into three grades: 1, 2, and 3, depending on the degree of pre-invasive changes, with 1 and 2 corresponding to mild and moderate dysplasia, whereas 3 corresponds to severe dysplasia and CIS. There is a greater chance of CIN1 regressing to normal epithelium spontaneously so it is known as a low-grade lesion, whereas 2 and 3 are classified as high grade. In North America, and a few other countries [5], the Bethesda classification of abnormal cervical epithelium is followed, where the abnormality is referred to as low-grade squamous epithelial lesions (LSIL) or high-grade squamous epithelial lesions (HSIL). When the incidence of CIN in the countries of Western Europe are compared, the UK stands out as having the highest incidence, with a peak occurring between the ages of 25 and 29 years, although only CIN3 had been officially recorded. Previously, there had been a continuing fall in the incidence of CIN3 in the UK but this was followed by static annual figures that could be due to the uptake of screening services by migrants who did not have screening in their countries of origin [5], and were diagnosed on arrival to the UK. The screening for CIN and its diagnosis and management, in particular, can result in considerable anxiety in many women, and can cause distress and depression.

Walboomers and colleagues reported that 99.7% of cervical cancer specimens from a Dutch sample of affected women showed the presence of human papilloma virus (HPV) [6]. Pista and

co-workers, from their multicentre observational study in Portugal [7], reported that 99.9% of specimens with CIN2, CIN3, or invasive cervical cancer had HPV infections (16, 18, and other subtypes). Nonetheless, the current HPV vaccines protect only against 77.4% HPV genotypes, which cause invasive cancer in their population, with cross-immunity for other oncogenic HPVs yet to be evaluated. Giorgi Rossi et al. from Italy [8] reported of a fall in invasive cervical cancer. HPV 16 was the most common HPV infection that was present in 66.4% of CIN2 or 3, and 66.8% of invasive cervical cancer, whereas HPV 18 was present in 7% and 11% of CIN2 or 3, and invasive cancer, respectively. Furthermore, the incidence of genital warts as a marker for HPV infection has been rising in both females and males with oncogenic HPV types 16 and 18 being present in approximately 15% [5].

HPV genital infection is acquired by sexual contact, and cleared by the majority of women within two years, unless their cell-mediated immunity is compromised. The HPV enters the cell cytoplasm (episomal) through a breach in the epithelium, and multiplies there but is cleared by the host's immune system if the concerned woman is immunocompetent. When not cleared, the HPV enters the nucleus (integration) of the cell, and continues multiplying so the cell, instead of undergoing death after 40–60 cycles, is immortalised. Additionally, the virus' E6 and E7 proteins bind to structures in the cell cytoplasm that regulate cell division and interfere with this function as well as causing DNA damage, which consequently converts the cell to a malignant cell line. It is not known why some cells progress to high-grade CIN, although it is recognised that being immunocompetent can prevent the progression to high-grade intraepithelial changes. The natural history of the precancerous condition indicates that 22% (29/131) of women with CIN3 would eventually (5–28-year follow-up) develop invasive cancer [9], but the exact time interval to the conversion to cancer, or which cervical cells will definitely become malignant, is not known for certain. While it is recognised that the majority of HPV infections result in CIN1, which regresses in approximately two-thirds of women to normal epithelium, and progresses in 10% to high-grade lesions, which of these cells in the epithelium will eventually progress to a high-grade CIN lesion cannot be definitely ascertained.

CIN can be associated with adenocarcinoma-*in-situ* or high-grade cervical intraepithelial glandular neoplasia (CIGN). CIGN may involve the whole cervical canal, or exist as skip lesions [5] though it is usually within 1 cm of the squamocolumnar junction. It is rare and treated by cone biopsy. Recurrence is common and reportedly occurs in 14%, even if the cone margins are free of disease. Cytological screening is unsatisfactory, and colposcopic features are not reliable, consequently impeding the formulation of optimal follow-up strategies. Regular endocervical cytology is advised during post-treatment follow-up along with the conventional practise of carrying out a cervical smear, and the colposcopic evaluation required for the screening of CIN.

Detection of CIN using cervical cytology and colposcopy

A screening test for CIN follows the usual principle of identifying a subgroup in a reference population that is at risk of a disease, and in this case, it is women who appear healthy who are targeted. Screening for CIN is carried out by cervical sampling, which was previously carried out by taking the Papanicolaou (Pap) smear but this method only included about 20% of cells from the sample. Liquid-based cytology [5], such as the 'Surepath^{TM}' or 'ThinprepPap test' that are being used now reduces the proportion of inadequate smears, and the latter method also allows for screening of HPV and sexually transmitted disease (STD), if indicated. Quantitative HPV estimation can be of discriminatory value when borderline smears are reported.

Where 98% of cytological smears are adequate for diagnosis, approximately 10% may not be normal [5]. These abnormalities can be broken down into: borderline nuclear abnormalities (3.3%); mild dyskaryosis (1.7%); moderate dyskaryosis (0.5%); severe dyskaryosis (0.5%); and

invasion or glandular abnormalities (<0.1%). Borderline changes and mild dyskaryosis are very common in young women with the proportion of moderate dyskaryosis being highest in 20–29-year-old women, and severe dyskaryosis in 25–34-year-old women. False-positive rates vary from 7% to 27%, and false-negatives from 20% to 50%. In the UK, the cervical screening programme starts at 20–25 years of age, with regional variations, and is carried out every three years until the age of 49 years, and thereafter 5-yearly until the age of 64 years. Women with a cervical abnormality are referred for a colposcopy—a secondary investigation, in the UK. This is unlike certain other countries that do not have an organised cytological screening programme, and use colposcopy as the primary method of CIN surveillance.

A colposcope (binocular microscope) magnifies the cervical epithelium from ×4 to ×25 times. When examining the cervical epithelial cells [5], they are first visualised in their natural state, and then the application of saline under a ×16–×25 magnification enables a clear vision of capillaries/leucoplakia. Finally, visualisation after applying acetic acid is carried out when areas of high nuclear-cytoplasmic ratios turn acetowhite, and may indicate CIN or generating epithelium, or subclinical HPV infection. An experienced colposcopist can discriminate between different areas of acetowhite, and also takes into account the appearance of punctation and mosaicism that is more common with CIN, besides being able to identify bizarre-shaped vessels that are associated with cancer. Furthermore, Lugol's iodine, if applied to the cervix, shows glycogen containing normal cervical cells as brown, whereas areas of CIN or cancer appear unstained, as they have little or no glycogen, so that the abnormal areas are better delineated from the normal epithelium.

Whether, when, and how to treat CIN can be contentious. Cervical screening has confirmed that the reversal to normal epithelium occurs in most individuals with low-grade CIN. There are no randomised trials of immediate colposcopy versus community-based cytological follow-up. The patient's viewpoint should also be included in the decision-making about how and when to treat the CIN. There is some agreement that CIN1 should not be treated, as the majority resolve spontaneously; a follow-up should be instituted with a biopsy, if the area with CIN does not revert to normal in two years. Regarding CIN2 and 3, treatment is advised by excision [10], such as large loop excision of the transformation zone (LLETZ) using an electrodiathermy loop or a needle excision (NETZ) using a straight diathermy wire or by performing a cold knife cone biopsy when the specimen margins are not affected by heat. LLETZ, a European term, is synonymous with loop electrosurgical excision procedure (LEEP) – the North American term. Vaporisation using a laser is another option, as is cryotherapy, where the abnormal area is destroyed but both these ablative methods lack the advantage of obtaining a specimen for histopathological examination, which can confirm the presence of cytoplasmic/nuclear abnormalities of CIN, and give assurance that the specimen margins are free of disease. The ablative method can therefore initially be less reassuring to an anxious patient that the treatment provided has completely destroyed the abnormal area, and uncertainty may have an impact on such a patient's psychosocial and sexual health. A treatment is considered successful when the cytology at six months post-treatment is negative.

A patient's need to start a family is an important aspect to be considered when discussing the treatment of CIN along with her cytological report. Cervical excision could affect a future pregnancy by causing cervical incompetence, which can lead to a miscarriage or preterm labour [11–13], resulting in a preterm birth, and raise relevant neonatal health concerns. Heinonen et al. [11] in a retrospective register-based study, observed that a LEEP increased the risk of preterm delivery by twofold (n = 547; 7.2%) over the background rate of 4.6% (n = 30 151), and an odds ratio (OR) of 1.61 (confidence interval, CI, 1.47–1.75; number needed to treat to harm, 38.5). It was increased threefold, with a repeat LEEP that would imply more caution when carrying out such treatment procedures, and also taking care when performing a diagnostic LEEP. Jakobsson et al. [12] in a retrospective cohort study found that preterm delivery was increased threefold (RR

2.61; 95% CI, 2.02–3.20; number needed to treat for harm, 14) after LEEP conisation compared with the background rate (4.61%) of preterm delivery, and fivefold after a repeat LEEP. In another study, Noehr et al. [13] analysed population-based data, and reported that the preterm delivery rate was increased by twofold (6.9%) over the background rate of 3.5% (OR of 2.07; 95% CI, 1.88–2.27; LEEP vs no LEEP)).

A novel treatment of CIN, photodynamic therapy [14] has been reported. In this comparative study of conisation versus photodynamic therapy (PDT) using hexylaminolevulinate (HAL) for the treatment of CIN2 or 3, Soergel et al. reported that it was economically sound to provide the latter treatment. PDT left the cervix unscarred without being incompetent, thereby avoiding the increased risk of preterm labour associated with conisation. Thus PDT would be beneficial to women who desire a future pregnancy. Long-term follow-up of this treatment remains to be evaluated.

When to treat the cervix with CIN has been deliberated by Ebisch et al. [15], in order to assess overtreatment in a see-and-treat management strategy based on the patient's cervical smear, colposcopic impression, and histology results. Their assessment method is compared with the current two-step treatment practised, where the initial colposcopy and biopsy is followed by treatment at a second visit based on the report of the initial biopsy; it has an overtreatment rate of 11–35%. The random effects model was used to account for heterogeneity in the studies reviewed. Overtreatment was considered where patients with no CIN or CIN1 had been treated. A total of 13 studies ($n = 4611$) were selected with the overtreatment rate being 11.6% (95% CI, 7.8–15.3%) in those with high-grade cervical smear and colposcopic impression, and 72.9% (95% CI, 68.1–77.7%) in those with a low-grade cervical smear and colposcopic impression. Overtreatment was 29.3% (95% CI, 16.7–41.9%) in those with high-grade cervical smear and low-grade colposcopic impression and 46.4% (95% CI, 15.7–77.1%) in those with low-grade cervical smear, and high-grade colposcopic impression. The authors' conclusion was that for the high-grade cervical smear and the high-grade colposcopy group, the overtreatment rate with 'see-and-treat' was similar to the two-step procedure currently being practised. Hence, the former could be introduced into clinical practice for select patients. The authors also commented that their results are in accordance with the British National Health Service Cervical Screening Programme, which advises a see-and-treat management in only those with CIN2/3 or cervical glandular intraepithelial neoplasia, as does the advice from the European Federation for Colposcopy and Pathology of the Lower Genital Tract. In a mini-commentary from the USA [16], Waxman commented that see-and-treat is an option in select women only, although colposcopic impression is not a part of the assessment advised by the American Society for Colposcopy and Cervical Pathology; HPV status, if known, is however considered. Colposcopically directed biopsy may have a role where the cervical smear is high grade but if the colposcopic impression is low grade further research has been suggested.

The psychosociocultural aspects of receiving a diagnosis of CIN and its treatment

Variegated studies on psychological sequelae of the colposcopic follow-up of an abnormal cytology result from cervical screening [17], have been discussed in a recent systematic review by O'Connor and colleagues. The 16 studies selected had evaluated psychological well-being, using varied methods and concluded that adverse outcomes, particularly anxiety, can follow colposcopy and directed procedures. Five studies reported on depression post-colposcopy and four on distress. Of the four studies measuring post-procedure distress after colposcopy, one of them reported that one-third of patients were distressed. Worry and fear about cancer, and future fertility were reported by one-third of patients in another study. Five studies compared pre- and

post-colposcopy psychosexual functioning, although no consistent pattern emerged from the evaluations. Only one study used a validated instrument, and reported that the post-colposcopy score indicated female sexual disorder. Ten studies, which investigated predictors of these adverse psychological/social outcomes concluded that further research was warranted. Temporal trends in psychological outcomes such as distress and anxiety after colposcopy were investigated in seven studies, which finalised their results as mixed findings. The heterogeneous findings from all these studies prevent formal statistical assessments. Despite the limitations of these studies, the conclusions helped unearth certain under-recognised problems associated with colposcopy and abnormal smears. Further clarification about the magnitude of these adverse psychological outcomes, their duration, and the reasons behind why some women were at increased risk of physical, mental, and social distress is required. The authors concluded that the cost of the negative psychological impact of cervical screening needed more attention in future studies.

Rahangdale commented [18] on O'Connor et al.'s review on colposcopically directed treatment of cervical dysplasia, and its impact on the woman. Distress, anxiety, and depression, together with worries about cancer/infertility and sexual dysfunction related to colposcopy and directed treatment were 'potential harms'. The limitations of the studies on the various issues related to colposcopic management of abnormal cervical cytology is stressed, as it reflects on the findings of the systematic review, and on the complexities of equating the pros and cons of colposcopy with its invasive extension—LEEP. There is mention of the previous practise of annual cervical screening in the USA (now revised), which did not decrease the incidence of cervical cancer or mortality but inherently led to unnecessary treatment with long-term morbidity, such as physical discomfort, emotional distress, and preterm delivery; this was also described by O'Conner et al. Accordingly, adding HPV screening to current screening guidelines would complement efforts to prevent cervical cancer, and hence reduce the stress from colposcopy, and related treatment. Balancing the harm–benefit ratio is tenuous, and the value of O'Connor's review in highlighting the emotional and relationship issues arising from colposcopy and directed procedures is stressed.

In a more recent case–control study [19], Frega et al. also included early loss (miscarriage) rate, and noted that there was no difference in this after LEEP ($n = 475$; 4.6%) when compared with the background miscarriage rate ($n = 441$; 4.1%) or after retaining a post-LEEP cervical canal length of 15–30 mm. However, those with a cervical canal length of under 15 mm, with removal of a wider volume of cervical tissue, had an increased risk of preterm delivery (OR 5.31; 95% CI, 1.01–28.07). Even though a cautious approach is advisable in carrying out a LEEP to reduce the risk of miscarriage or preterm delivery, it may not be possible to stop preterm contractions in all patients with progression to delivery even after applying a MacDonald cervical suture that encircles the cervix to stave off preterm birth.

Vaginal and vulval cancer, which are less common, also have premalignant stages, referred to as 'vaginal intraepithelial neoplasia' (VAIN) and vulval intraepithelial neoplasia (VIN). Their treatment is surgical with major biopsychosocial consequences, particularly if multicentric [5]. Multicentric intraepithelial neoplasia (MIN) can effect a select group of females who are immunocompromised, e.g. due to HIV or those who are immunosuppressed for transplant surgery. Such precancerous changes can concomitantly effect the cervix, vagina, vulva, perineum, anal canal, and natal cleft. These females present with repeated abnormal smears, even after treatment of CIN. The chronicity of the disease can result in the patient requiring repeated smears/biopsies from the affected sites with abnormalities leading to repeat treatments; the resultant major psychosomatic sequelae necessitates a culturally sensitive approach by those involved in the management. Lesions of the perineum and anal canal may result in excision, skin-grafting, and temporary colostomies, with management by a multidisciplinary team of a gynaecologist, plastic surgeon, colorectal surgeon, stoma nurse, and a psychiatrist. Besides the effect of the diagnosis

and treatment of premalignancy on the patient, the impact on the partner and their psychosexual health could be considerable, as with cancer (see Chapters 10 and 11). Moreover, other premalignant conditions can arise from the cellular structures of the perineum and introitus or adjacent thigh, and involve the vulvovaginal tissues. Although less common, they can progress [5] with metastasis, and cause major repercussions on the health of the affected individual. This includes wide-ranging limitations to the patient's physical, mental, and social functioning, which relates to the extent of the disease and can distress her close family members (see Chapter 10).

Clinical vignettes 1 and 2 (Table 8.1) depict the impact of the management of premalignancy.

Table 8.1 Clinical vignettes: The impact of the diagnosis and treatment of premalignancy

	Vignette 1: Pregnancy complications following treatment of CIN: British Caucasian	**Vignette 2: Pregnancy complications, sequelae of a melanoma: British Caucasian**
Presentation and management	*Ms AW, a 37-year-old high school teacher, in her 2nd pregnancy, had a termination of pregnancy in her late teens; a steady relationship since 4 years; unsuccessfully tried for a baby and was investigated for subfertility; ovulation induction with clomiphene citrate and artificial insemination was unsuccessful* ◆ Ms AW was relieved when put on the waiting list (WL) for *in vitro* fertilisation (IVF) when a routine cervical smear indicated moderate dyskaryosis; a colposcopy showed punctation and mosaicism with an unstained area that included the squamocolumnar junction; Ms AW and her partner selected the option of excision of the abnormal area by LLETZ at the same sitting, for they wanted it 'over and done with'; Ms AW was discharged but returned the next day agitated about vaginal bleeding; on examination, only slight oozing was seen and a vaginal pack was reinserted with advice for the district nurse to remove it; the bleeding settled and she went back to work ◆ At her follow-up appointment she was told that she had had a CIN2 and the sample margins were free of disease; Ms AW and her husband were pleased; incidentally she mentioned that she had missed her period; a pregnancy test was positive; they were surprised but very happy	*Mrs AH, a 34-year-old health professional, in her first pregnancy, resulting from ovulation induction* ◆ Her history and investigations (laboratory, imaging/endoscopy) for primary subfertility along with relevant investigations of her husband had established a diagnosis of unexplained infertility ◆ Ovulation induction by stimulating the hypothalamus and pituitary with clomiphene citrate was started from the fifth to the ninth day of each cycle; a plan to add uterine insemination if she did not conceive within three months was made ◆ Her ovulation predictor kit confirmed LH surges and ovulation; she conceived at the third cycle when on a dose of 100 mg of clomiphene citrate ◆ The couple were delighted that the pregnancy test was positive; an ultrasound scan at six weeks confirmed a singleton pregnancy with a fetal pole; she accepted serum screening and a detailed ultrasound scan confirmed an active singleton with no anomalies evident on scanning ◆ She was a regular attender who wanted a vaginal delivery ◆ She planned to take maternity leave at 34 weeks

(*continued*)

Table 8.1 Continued

	Vignette 1: Pregnancy complications following treatment of CIN: British Caucasian	Vignette 2: Pregnancy complications, sequelae of a melanoma: British Caucasian
	◆ The ultrasound scan revealed an intrauterine pregnancy; she was very anxious in view of her recent cervical treatment; she opted for routine antenatal care but early maternity leave was planned ◆ The detailed US/S at 16 weeks revealed no anomaly but a funnelling of the cervical canal was noted and cervical incompetence confirmed; in view of her recent cervical treatment, insertion of a MacDonald's cervical suture to aid pregnancy retention was discussed; it was inserted after obtaining consent; serial weekly ultrasound scans to check the inserted suture and cervical dilatation was planned along with the usual antenatal care ◆ She was having occasional twinges from 22 weeks onwards which settled on taking paracetamol tablets ◆ At 23 weeks and 4 days her twinges increased to pain with slight per vaginal (PV) blood staining; she visited the hospital and was admitted to the labour ward for observation and analgesia; she was afebrile and normotensive and consented for an examination; the fundal height corresponded to the length of her gestation, the uterus was soft non-tender, the fetus was active with a breech presentation and a regularly beating fetal heart; speculum examination confirmed the cervical suture in place with no PV bleeding ◆ Her pain subsided and there was no further vaginal staining; she was transferred to the antenatal ward with a view to gradual mobilisation; she was excited as she was excited at her pregnancy progressing for to receive steroids to enhance fetal lung maturity at 24 weeks; she requested her husband who was overseas to return soon ◆ On mobilising, her pains restarted, and she was transferred back to the labour ward for closer observation overnight ◆ Close observation in a side-room continued after she was examined; no uterine tenderness or PV loss was observed and the speculum examination confirmed a closed cervix with the suture *in situ*; her ketonuria indicated dehydration	◆ At 32 weeks, she noted a small itchy mole on the left(L) side of her perineum close to her groin ◆ Her MW could not assess it and referred her to the obstetric consultant's clinic for a specialist's opinion; he thought it was an unusual symptom, and recognised the need to have a joint consultation with a plastic surgeon regarding further management ◆ The plastic surgeon confirmed a flat melanoma, 4 mm in diameter, with irregular edges, and no inguinal lymphadenopathy ◆ Mrs AH had been expecting bad news all along and was devastated on hearing of the diagnosis and the possible management as was her partner ◆ Fulfilment of the maternal role was important to her ◆ The decisions from a meeting of a specialist skin cancer multidisciplinary team (SSCMDT) of health professionals who discussed her further management were contentious ◆ Discussions were about excision with/without sentinel node biopsy and/or radiotherapy after a caesarean delivery; the options were immediate caesarean after giving steroids or a caesarean delivery at 35 weeks' gestation ◆ There was no scientific evidence about adding radiotherapy post-surgery when nodes were negative and it would affect her plan for breast-feeding; earlier delivery could also affect the baby's survival/health and Mrs AH would not compromise on this ◆ Heated discussions among professionals ensued with a small group insisting on listening to the couple's wishes about delivery in the absence of scientific evidence to the contrary, as it was ethical ◆ A range of emotions associated initially with non-acceptance of the diagnosis, then denial and guilt affected Mrs AH; anger was sometimes directed at her partner

Table 8.1 Continued

	Vignette 1: Pregnancy complications following treatment of CIN: British Caucasian	Vignette 2: Pregnancy complications, sequelae of a melanoma: British Caucasian
	◆ Pain relief was requested; oral codeine and paracetamol were given, and an intravenous infusion started; she settled initially but woke up in the early hours and complained of pain; irregular tightenings were noted with no vaginal bleeding; oral pain relief was repeated, and she seemed satisfied ◆ A second opinion was taken from the consultant on-call who agreed with the conservative management and removal of the suture if she began contracting or had vaginal loss; the baby was not to be resuscitated as per management guidelines for <24 weeks' gestation ◆ The attending midwife (MW) attempted to calm her but Ms AW was getting distressed and afraid that she would lose her baby ◆ Suddenly she wanted to push and was in severe pain; a gush of blood-stained liquor began draining; the attending obstetrician saw her straining to push; a lower limb had been delivered and the MW heard a bradycardia; the knot on the suture was steadied and the suture cut and removed; she was almost fully dilated and a breech delivery was facilitated; the fetal heart was heard by the MW soon after delivery but then she could not auscultate it ◆ Ms AW was extremely distressed and wanted the baby to be resuscitated despite having a previous discussion regarding the issues with viability and guidelines ◆ Oxytocics were given and the placenta was delivered complete with membranes ◆ The probable male fetus was declared dead and discussions regarding this experience and further management were initiated empathetically; she was transferred to the room for the bereaved; the baby was dressed and a photograph taken; she wanted to name the baby and talk to a chaplain and this was arranged ◆ Her husband was travelling back and could not be contacted; Ms AW informed her sister who offered her sympathy and both grieved the loss	◆ It was a much wanted pregnancy; the couple did not want any further help with their personal reflexions although Mrs AH started having headaches and insomnia ◆ The couple had prolonged discussions with the health professionals before they finalised ◆ They decided to wait until 35 weeks for a LSCS and then Mrs AH would have treatment for the melanoma for she felt that this would be better for the baby ◆ At the planned caesarean delivery, a male baby weighing 2800 g was delivered; Mrs AH started bonding with her baby and breast-feeding him soon after ◆ The lesion was excised and sentinel node biopsy was carried out; skin grafting was not required ◆ A malignant melanoma (stage 1b) was confirmed ◆ Mrs AH did not opt for radiotherapy; scientific evidence did not contradict her wishes ◆ She had slight oozing from the surgical site, which healed with a course of antibiotics but slight scarring without disfigurement persisted ◆ Mrs AH seemed to enjoy her maternal role but occasionally feared recurrence when she became anxious or 'moody'; she felt guilty of this unstable mood, which sometimes affected her relationship, her resumption of leisure activities, social networking, and employment ◆ She did not want professional support for this ,as she felt it was 'not a problem' ◆ She attended her follow-up visits regularly and complied with advice ◆ She resumed her professional work but opted for a part-time roster schedule ◆ At 18 months post-surgery she felt low, and had relationship problems

(*continued*)

Table 8.1 Continued

	Vignette 1: Pregnancy complications following treatment of CIN: British Caucasian	Vignette 2: Pregnancy complications, sequelae of a melanoma: British Caucasian
	◆ Routine medical checks were carried out, which showed normal parameters with a well-contracted uterus and average lochia; leaflets regarding infection screening and post-mortem of the fetus were given and briefly explained; she would stay in the bereavement room until her husband arrived and they were ready to go home ◆ Ms AW's husband arrived later that day and stayed with her; both were visibly distraught; they consented for a post-mortem and opted for discharge the next morning; short-acting hypnotics were prescribed as Ms AW could not sleep despite feeling exhausted ◆ A date for a follow-up visit was given to discuss the findings of the investigations and planning for a future pregnancy; the addresses of local bereavement support groups were given to the couple ◆ A home follow-up initially by a community MW and then by a health visitor was arranged; there was to be a short threshold for assessing depression and getting her GP's attention if Ms AW developed a persistent low mood	◆ Mrs AH sought psychological support from her GP ◆ At three years post-surgery she was complaining of dyspepsia and lack of appetite when a liver scan confirmed metastases to her liver ◆ She accepted stereotactic body radiotherapy for the liver metastases advised at a SSCMDT meeting but PET scans confirmed further spread ◆ The disease was relentless; her wish to stay at home with her toddler, and continue with follow-up visits was accepted ◆ She was managed by her GP, a nurse, a friend, and her husband ◆ She began losing weight with a loss of appetite and was felt tired ◆ She began complaining of pain over her right shoulder, which was not relieved by oral or injectable analgesia; she had an evaluation by the SSCMDT who diagnosed it as referred hepatic pain; low dose whole body radiotherapy was given but the pain relief did not last ◆ She began complaining of left hip pain, and her mobility became greatly restricted; skin metastases were treated with imiquimod ◆ Waiting at the GP's surgery was trying, so she requested home visits ◆ She met her chaplain after a bout of haematemesis and passed away with her family around her; no resuscitation was given according to her wishes in the 'Advanced Directive to Refuse Treatment' ◆ Her husband was extremely distressed; the child was kept busy when in the nursery but sought his mother when home; he hoped that she would board 'the train with Thomas, the tank engine, and ring the door bell', he would need support ◆ Early death curtailed Mrs AH's roles notably her maternal role

Table 8.1 Continued

	Vignette 1: Pregnancy complications following treatment of CIN: British Caucasian	**Vignette 2: Pregnancy complications, sequelae of a melanoma: British Caucasian**
Psychosocial initiating and maintaining factors appropriate biopsychosocio-cultural care	◆ Ms AW had a TOP in her late teens and this was followed by two unsatisfactory relationships which made her occasionally feel low but she was kept extremely busy with teaching/exam supervisions/paper corrections, etc. and had never wanted treatment for her symptoms ◆ Her partner of five years was supportive and cooperated with subfertility investigations and the management plan besides sharing disappointments ◆ Ms AW was distressed at the abnormal smear report but was able to decide about the cervical treatment with her husband; she wanted to keep her IVF schedule ◆ The couple were surprised at the spontaneous pregnancy when initial assisted conception techniques had failed ◆ Despite discussions about the cervical suture, the couple were not prepared for the onset of uterine contractions ◆ The chaplain, Ms AW's sister, and her husband gave her support without making it obtrusive; as because of her independent personality she would refuse any support unless necessary; depression can cause serious harm ◆ Although she preferred to keep her grief private she sought help when she had difficulty in falling asleep in her room ◆ Postnatal surveillance for detecting depression was flagged in her notes at discharge from hospital	◆ Mrs AH enjoyed her childhood and teens in a safe neighbourhood with good schooling, which helped develop her urge to learn through self-discipline; she started oral contraceptives in her late teens ◆ She was of a pale complexion and occasionally used a sunbed to look tanned and 'healthy' ◆ She entered her chosen field, excelled in it, and developed a steady relationship ◆ She stopped oral contraceptives at 29 years of age to start a family ◆ Her subfertility was a surprise ◆ Mrs AH was delighted with her pregnancy after ovulation induction ◆ Her personal feelings for her much wanted unborn child overcame her ego for her own welfare, so she refused earlier treatment ◆ Her personality of getting on and coping with problems without external help made her refuse help that was offered during her pregnancy to assist her in decision-making about her treatment ◆ She had become anxious after the diagnosis of a melanoma was conveyed to her ◆ She was satisfied with the delivery outcomes, and treatment of the melanoma and breast-fed as planned ◆ At 18 months after treatment she recognised that her dysphoria impacted on her family roles, so she sought help ◆ She conformed with the medical advice, and signed a living will
Impact on the healthcare system	◆ Ms AW's stress would have been reduced when on the WL for IVF and she conceived spontaneously and attended the MW's clinic and the hospital for booking her pregnancy; she needed intensive healthcare because of the incompetent cervix; loss of the much wanted baby would make her vulnerable for psychosomatic illness, so the healthcare system would have to engage closely to	◆ Mrs AH and her partner had been investigated for subfertility and were delighted when the ultrasound scan confirmed a live fetus; routine antenatal care was accessed at intervals; their joy was curtailed when the diagnosis of melanoma was made and the multidisciplinary conference debated her treatment; her stress increased at this juncture but she declined

(*continued*)

Table 8.1 Continued

	Vignette 1: Pregnancy complications following treatment of CIN: British Caucasian	**Vignette 2: Pregnancy complications, sequelae of a melanoma: British Caucasian**
	detect and treat any dysphoria; the follow-up for the treatment of the abnormal smear would also continue; future management of her subfertility along with outcomes of Ms AW's IVF attempts would need close monitoring and assessments ◆ Additional costs for health and social care services would continue	additional support at this phase or after her caesarean delivery, or after the treatment of the melanoma; she sought help only when her dysphoria interfered with her roles of wife and mother ◆ Mrs AH had a supportive partner so she did not accept further help until she felt unable to cope with her physical/mental ill-health
Implications for training	◆ Ms AW had multiple factors interfering with her health but her personality and busy work schedule made her cope satisfactorily; she complained less; her occasional low mood could turn into undetected severe depression with graver implications; recognising Ms AW's personality and being cautious that serious psychosomatic illness did not go undetected when intensive care was indicated meant informing a team of interdisciplinary health professionals to review Ms AW comprehensively—a part of psychosomatic training	◆ Mrs AH had developed her personality through self-discipline since childhood; she did not seek help early and braved things until the end of her tether; recognising this personality-type and being alert that serious physical/mental illness did not slip detection was important; health professionals unfamiliar with the mind-body approach would need training to effectively plan management for such personalities; Mrs AH's wishes were respected so palliative care addressing biopsychosocial aspects was given at home; psychosomatic training endorses this
Was this form of management appropriate and what did it prevent?	◆ The management was appropriate as it made Ms AW feel reassured that plans were made to deal with all eventualities including the sudden bereavement from losing her baby; arranging tailored biopsychosociocultural support would prevent future psychosomatic disease	◆ The management was apt for Mrs AH. The guidelines for managing melanoma matched Mrs AH's choice so more aggressive treatment was unnecessary, and would be unethical; her attitude prevented over-use of healthcare resources. She valued her baby's welfare over her own
Other forms of presentation	CIN2/3 can present as a vaginal discharge, particularly if HPV infection is present along with other STDs of the lower genital tract; the discharge could also be blood stained. When a benign to malignant transition occurs, other than itching and irregular margins, a melanoma can present with a change in characteristics of a previous mole, e.g. change in colour, enlargement, or a blood stained discharge.	

Learning points

In the vignettes shown in Table 8.1 both Ms AW and Mrs AH desired a baby. Premalignant changes were detected early, yet the outcomes were less than appropriate. CIN has a more indolent progress to malignancy, yet Ms AW wanted it treated by a one-stop procedure in order that she could have an IVF at the planned date; her cervical incompetence prevented a successful pregnancy outcome. The psychosomatic aspects of her loss would have to be minimised during her

grieving process prior to her IVF. She may need additional support during her next pregnancy. As the risk of preterm cervical dilatation was documented with this pregnancy, she would have a cervical suture inserted earlier on in her next pregnancy along with tocolysis, as indicated. Would a longer period of observation of her CIN2 and excision at a later date have been the better option? Mrs AH's itchy mole was detected early by her and it was rapidly brought to a multidisciplinary team discussion (SSMDT), and the medical treatment advised conformed to the option she had selected. Although malignant changes were not detected on checking the sentinel node, systemic micrometastasis may have been present to cause the rapid progression to advanced malignancy after metastases were detected in the liver. Would less exposure to sunbeds have prevented it? These questions will remain unanswered. Both Ms AW and Mrs AH had made informed decisions about the treatment of their premalignancies as the desire for a successful pregnancy outcome influenced their decisions. The characteristics of the malignancies related to their prognosis was of lesser relevance in the decision-making of these women. The psychosomatic approach can help understand the decision-making process of strong personality-types that endure adversity until persisting problems make them take another route; Ms AW and Mrs AH fell into such personality-types, and the medical team had to ethically accept their decisions.

Prophylaxis of CIN

If HPV is the main causative factor for CIN, it is to be expected that preventing such infection would reduce the incidence of CIN and the resultant progression to cervical cancer. HPV infection also makes the woman/adolescent more prone to develop VAIN/VIN so prophylaxis against HPV infection would also act as a preventative factor for premalignant changes resulting from such infection of the vagina and vulva. However, vaccination against HPV is currently designed to prevent infection caused by the specific genotypes targeted by the vaccine, namely types 16 and 18 with the bivalent vaccine, and types 6, 11, 16, and 18, with the quadrivalent vaccine. As cervical cancer is associated with types 16 and 18 in 70% of women [5], the prophylaxis from vaccination targets women with these infections. Its probable effect on herd immunity, and thus its impact on other prevalent carcinogenic genotypes in different populations it still to be evaluated. As the prevalence of precancerous HPV types in different communities is variable [6–8], allocating vaccine-generated immunity to cover other prevalent carcinogenic genotypes (30%) is implausible. Due to a lack of clarity in the multifactorial aetiopathogenesis of MIN, the currently administered HPV vaccine would only be suitable as a prophylaxis for 30% [5] of these patients. Furthermore, the unvaccinated male partner may additionally harbour HPV genotypes not targeted by the current quadrivalent vaccine, and infect his partner, despite her having been vaccinated. The HPV vaccination programme provided by the NHS in the UK [20] has only targeted females from the age of 11–13 years until the age of 26 years, with two doses being given to females at 12–13 years and three doses if vaccinated after 13 years. To date, it has not been considered cost-effective to vaccinate British males. A recommendation in a report by the Joint Committee on Vaccination and Immunisation is awaited.

In the USA, both sexes are offered vaccination [21], with the programme being directed to include females and males from the age of 11–12 years. It is also offered to females aged between 13–26 years of age and to males of 13–21 years of age, with the aim being to protect against HPV infections of the anal canal and oral cavity/oropharynx in both sexes, and penile infection in males. If uptake of the quadrivalent vaccine increases the immunity in the vaccinated individuals, such protection can last for ten years and prevent infection by an unvaccinated male, who is infected by the HPV genotypes that are included in the vaccine. However, the need for a booster dose at this juncture is still under evaluation, with no current guidelines available. If the contribution of the infected male as a carrier of HPV is ignored in the prevention strategy for HPV, he could infect with the

HPV genotypes, which he harbours that are not included in his partner's HPV vaccine, or if her period of immunity is over, and due care is not taken to use a condom during intercourse. An infection of the female partner by a strain of oncogenic HPV not included in the vaccine could create anguish, and probable dysphoric symptoms along with relationship problems in the couple, particularly if she was falsely reassured that vaccination would protect her from infection by all genotypes of HPV, and that she could have unprotected intercourse. Hence, reliance on the cervical screening programme and/or colposcopy remains of great value in enabling cancer prophylaxis by detecting/treating any areas of abnormal cytology with intraepithelial neoplasia, even after HPV vaccination.

The cost of the vaccines (US$140.00 per vial) may be prohibitive where medical care is not paid for by the state, particularly in low- or middle-income nations, thereby discouraging vaccination. In the UK, as HPV vaccination is paid for by the NHS so a low income is not a deterrent. In the USA, the uptake of HPV vaccination is variable, being around 32% in the female population, with substantially lower uptake rates in the uninsured, and in some females residing in the Southern states; likely reasons include refusal of parental permission or the cost of the three doses of vaccine [22].

Additionally, a prediction of a change in the natural history of the disease following vaccination has been surmised, as well as a reduced uptake in ethnic minority groups in the UK [23]. Certain cultural beliefs and social control may thwart parental consent for vaccination [24,25]. A systematic review highlighted ethnicity, and limitations of healthcare coverage in various regions, as deterrents to the uptake of HPV vaccination [26]. Other deterrents to the uptake could be side-effects, such as injection site redness/swelling/pain (frequent, if 1 in 10); fainting or non-epileptic seizures (less frequent if 1 in 100); urticaria (rare if 1 in 1000); serious allergic reactions, with troubled breathing besides facial swelling (very rare if 1 in 10 000); and fatality (extremely rare); these have been reported from a trial of Gardasil [27], and later by voluntary reporting. Pre-vaccination counselling should address these side-effects and any anxiety, especially when informing the parents of minors, who have to take the decision for their children.

Would not the barrier methods of contraception, if effectively practised, be a better prevention strategy against HPV, as there is global familiarity with it, and it has additional protective benefits? Barrier methods would also prevent other STD infections such as gonorrhoea and trichomoniasis as well as HIV that can co-exist with HPV infection. There is a low failure rate for prevention of pregnancy by barrier methods, and it could also protect against STD infections of the cervical cells [28] that, if pre-existing, could concurrently facilitate infection of the cervical cells with HIV. Similarly, a correct and consistent use of the condom is highly effective in preventing any failures in contraception, and would also be effective for preventing HPV infection [29]. When condoms were compared with female-dependent methods of contraception (sponge or diaphragm) with regards to preventing STDs, using female-dependent methods significantly lowered the rates of both gonorrhoea and trichomoniasis [28]; these methods however cannot prevent HPV infection [30] of the lower genital tract. Comparatively, the same sponge and diaphragm can be used for three years [31], and are cheaper than female condoms but female condoms provide the additional benefit of also protecting against HPV infection. Currently, plant-based vaginal gels that could be used to prevent HPV infection [32] are being researched, and could be a cost-effective method, especially for low-resource settings. Epstein [33] reasoned that the primary prevention of HPV infection would entail the early targeting of youth by encouraging them to use condoms, and hence reduce the incidence of HPV infection with its potential progression to CIN. This may however be contrary to the interests of proponents who have propagated the use of HPV vaccines in preference to condoms as a form of primary prevention strategy to reduce HPV infection. Nonetheless, where a female and her consort have not been infected with HPV, and are faithful to each other, the risk of intraepithelial neoplasia of the lower genital tract is minimal.

In certain cultures, where an engagement ceremony for marriage is performed just before/soon after adulthood, and the couple have not had any other sexual relationships, primary prevention of HPV infection by monogamy is a possibility. Cultural promotion of such behaviour by certain societies, e.g. in South Asia [34], where child betrothal (the couple are teenagers) with marriage in adulthood (average age, 19 years in India), which is socially sanctioned is still prevalent. Such practice could encourage cost-effective prevention against STDs, including infection by HPV. Prophylaxis against HPV infection by maintaining monogamy has received scant attention. Understanding the various cultural attitudes behind such exclusive choices, and the commitment of loyalty to each other can be difficult to fathom for those with different sociocultural beliefs that encourage non-monogamous, risky sexual behaviour. Nevertheless, the question of early betrothal and adolescent marriage in certain cultures raises major psychosociocultural concerns, especially if the choice of the couple differs from the decision of parents/elders, and is not taken into account. In some African nations, child marriage (girl, <18 years) is common practice [35], with the major concerns being that usually the much older man, who has had multiple partners prior to the marriage, gives a dowry for the minor girl. She enters his life as a sexual partner, usually without her consent and this can increase the risk of STDs along with HPV in the girl who has also been denied education. This practice is commonly associated with poverty, so the girl cannot leave if unhappy in the relationship, as she cannot repay her dowry. As such, the prevalence of cervical cancer is high in African countries. For instance, the average age at marriage for a female is 15 years in Mali [36], with the older husband having had multiple sexual partners, and being infected with HPV (97%) besides having contracted AIDS/HIV infection; these infections are transmissible to his wife. Delaying the sexual debut, and using condoms may prevent HPV infection but cannot be practised where the male partner refuses to do so, and this can occur where marrying a minor female is the norm. Most African countries do not have the infrastructure to have a comprehensive cervical screening programme [37]. Although the ceremonious commitment of a steady relationship in a monogamous young couple may be a cost-effective primary method of preventing HPV infection, it may be culturally confined to certain societies only.

Smoking is also related to CIN both indirectly and directly, and it is preventable. If early action is not taken, and the smoking becomes addictive (see Chapter 1) then quitting is difficult. It may need nicotine replacement with clinical help along with cognitive behaviour therapy, acupuncture, hypnosis and/or medication such as varenicline, along with close monitoring. Smoking indirectly interferes with the frequency of HPV infections, and thereby with the incidence of CIN that may progress to invasive cancer, or it can be a direct cause of the cancer [38]. Equally, it has been reported [39] that the effect of past or current smoking along with HPV infection increases the risk of squamous cell carcinoma of the cervix (n = 1463) but has no effect on the incidence of adenocarcinoma; the sample size of adeno- or adenosquamous cervical carcinoma (n = 124) was comparatively small in that study [39]. The direct effect of smoking on carcinogenesis is due to local immunosuppression, besides aberrant methylation of the tumour suppressor gene, p16 (CDNK2A), which then initiates a carcinogenic effect on the cervical epithelium [40]. Furthermore, cervical carcinogenesis related to smoking can also be associated with other unhealthy lifestyles or when facing severe stress routinely with psychosocial effects that can lower innate immunity. The International Agency for Research on Cancer listed cervical cancer among those cancers causally related to smoking that deserves more research [39] to promote cancer prophylaxis. The natural history of HPV deserves attention [41] to define its carcinogenic role.

A widespread uptake and acceptance of the cervical screening programme over the last decade, has led to a reduction of the incidence of cervical cancer in most Western nations, thereby testifying to its usefulness in cancer prophylaxis. These methods of detection/treatment of premalignant areas will continue to be offered concomitantly with other newer developments in cancer

prevention. It needs wider application globally after being modified to be culturally acceptable to different populations, and their healthcare providers.

The disease burden of obesity in gynaecology and obstetrics

Obesity is defined as a body mass index (BMI) of ≥30 kg/m^2. It is said to exist when a person who is overweight (≥25 kg/m^2) is unable to prevent a further increase in weight beyond the upper limit of this range (<30 kg/m^2). 'Extreme obesity' is commonly used to categorise individuals with a BMI of ≥40 kg/m^2. Obesity can start early, with 3% of children and adolescents being affected in the UK [42], and 16.9% in the USA [43]. There has been stability in the upward trend of overweight and obese adults in developed countries within the last decade, with some nations now showing a downward trend [44–49]. Nevertheless, the prevalence still remains high with extreme obesity still continuing to rise. Unfortunately, the low- and middle-income countries are now showing a rise in overweight and obese children; these countries have been promoting the consumption of a low-cost energy-rich diet, which has been twinned with a lifestyle that discourages physical exercise. A review of the epidemiological literature between 1970 and 1992 reported that one-third of obese children and a half of obese adolescents [50] continue to be obese in adulthood. Hence, prevention and early action to reverse childhood obesity, with involvement of parents to aid a modification of contrary attitudes towards diet and exercise is required. Moreover, recourse to help through behavioural therapy, if indicated, could help stall the progression to overweight and obese adults [51]. Globally, children and adolescents are greatly affected when obese, with a negative impact on their biopsychosocial health, particularly if teased by their peers; this can also impede school performance [52]. Unless further preventive measures are instituted, one-third of the British population will be classified as obese by 2030 [53]. Extreme obesity affects 6.3% of people in the USA, and about two-thirds of the population is considered as overweight or obese [54]. Being overweight has adverse effects on health, with several benign health conditions being associated with it, besides the increase in susceptibility to malignancies [55]. For most individuals, who do not have the rare genetic condition caused by a mutation of the leptin gene, that predisposes a person to obesity, maintaining a normal weight should not be considered a challenge. Yet obesity, a preventable condition, has become a modern-day affliction for many individuals who are compelled by biopsychosocial factors to become overweight and are unable to halt the progression to obesity.

Pathophysiologically, for most overweight individuals, the satiety centre in the hypothalamus through its corticohypothalamic connections, including that with the limbic system (see Chapter 1), is often implicated in the need for seeking extra helpings, despite having eaten generous portions. Eating disorders such as bulimia [56,57], which acts through the hypothalamus and its neurological connections, can also be associated with being overweight or obese [58]. Being obese or at a BMI close to obesity can also be associated with gynaecological disease conditions such as subfertility or cancer. Besides, the obese are at greater risk of problems with their pregnancy and labour, as well as associated diabetes, and at an increased risk for any surgical interventions. Obesity can also simultaneously impact on the overall health of the woman including her mental health [59]. Mind–body interaction causing unhappiness may be associated with the transition to becoming overweight and then obese. All these problems can affect reproductive health in the pregnant woman. Any chromosomal alterations that favour obesity in the pregnant woman can be transmitted by transgenerational mechanisms [60]; this can increase the likelihood of future generations being obese. Specifically, being overweight, and then obese can increase the risk of

endometrial cancer [61] as well as impinge negatively on the overall health of the woman, and the treatment of related diseases.

Obesity and endometrial cancer

Endometrial cancer is the most common gynaecological malignancy in many European countries and in North America [62]. In the UK, an annual frequency of 8475 new cases of endometrial cancer in 2011 [63] made it the most common women's cancer. In many Eastern European countries, the incidence of endometrial cancer has risen over the last three decades [64], and is on a par with the rise in obesity. Crosbie et al. have reported that a rise in BMI by 5 kg/m^2 is associated with a 1.6-fold increased risk of endometrial cancer [65]. Additionally, anthropometric measures such as waist circumference, and adult weight gain may also be associated with endometrial cancer. Aune et al. have reported [66] that the summary relative risk (RR) of endometrial cancer was: 1.27 (95% CI, 1.17–1.39, $I^2 = 71\%$) for a 10 cm increase in waist circumference, an RR of 1.21 (95% CI, 1.13–1.29, $I^2 = 0\%$) per 0.1 unit increment in waist-to-hip ratio, and an RR of 1.30 (95% CI, 1.19–1.41, $I^2 = 0\%$) for a 10 cm increase in the hip circumference. In addition, an RR of endometrial cancer of 1.15 (95% CI, 1.09–1.22, $I^2 = 61\%$) is associated with a 10 cm increase in height. Renehan et al. [63] emphasise that such an association between obesity and endometrial cancer is causal, and therefore by avoiding being obese, one could prevent the progression to cancerous changes in the endometrial cells.

The aetiopathogenesis of endometrial cancer

Obese women have hypertrophied adipocytes. Adipocytes release leptin, adiponectin, and tumour necrosis factor that reduce the metabolic response to insulin. Inflammation of the adipocytes causes secretion of adipokinins and cytokines [61]. These modify cellular adhesivity, and disrupt normal tissue architecture along with an increased angiogenesis that is referred to as tumourigenesis or carcinogenesis. Tumourigenesis [67] is promoted by these alterations in the endometrium at the expense of apoptosis [68]. Obesity is known to play a major role in tumourigenesis of endometrial cancer with a greater effect on endometrioid (type-1) cancer rather than on the non-endometrioid (type-2) cancer. Type-1 disease is more common (80%) than type-2 and has a lower death rate than the latter but still accounts for the major proportion of deaths [61]. In the obese woman, testosterone is aromatised to oestrogen in the adipose tissue [69]. Oestrogen floods the body and enters endometrial cells because there is a relative deficiency of its carrier—the sex hormone binding globulin. In the endometrial cell, oestrogen directly binds to the DNA of the cell to increase transcription, and modify several growth factor (including PI3K-Akt-mTOR and MAPK/ERK1,2) signalling pathways [70], thereby promoting cellular proliferation. This promotes tumourigenesis in the obese woman. Physiologically, progesterone protects against this oestrogenic proliferative effect in the second half of the menstrual cycle but this action is restricted in disease conditions, such as the polycystic ovarian syndrome, and with the advent of the menopause. Hyperinsulinaemia in the obese also reduces the proportion of insulin-like growth factor (IGF) binding proteins so there is an increase in IGF-1, which promotes cellular proliferation. Moreover, obesity is a chronic inflammatory state that results in elevation of proinflammatory cytokines such as interleukin-6, C-reactive protein and leptin [71]. The proinflammatory markers have an effect on carcinogenesis by affecting immune systems, and disturbing tissue homeostasis, as well as increasing oxidative stress. Despite this understanding of the natural history of the pathological changes in the hyperplastic endometrium, further elucidation is needed about preventing tumourigenesis.

Clinicopathological correlates of endometrial cancer and obesity

In their three-year multicentre randomised, double masked, placebo-controlled (PEPI trial) [72], Judd and colleagues found that in the postmenopausal woman, if only unopposed oestrogen was given when compared with giving oestrogen with progesterone; the former treatment was associated with simple (cystic), complex (adenomatous), or atypical hyperplasia that reverted to normal in 94% (n = 34/36) on replacing oestrogen with progesterone. This is similar to the endometrial hyperplasia that occurs naturally in obese women who have hyperoestrogenism because of the biochemical conversion of testosterone in their adipose tissues without the protective effect of progesterone.

Bokhman in 1983 proposed a dualistic model [73] of endometrial tumourigenesis, which was based on clinical observation, and clinicopathological correlates of a prospective study. The majority of women (65%) in the sample had type-1 cancer, which arose from the hyperplastic endometrium of obese women. These women had highly- and moderately-differentiated tumours (82.3% G_1 and G_2), with superficial invasion of the myometrium and a high sensitivity to progestogens (80.2%), and with a favourable prognosis (85.6% 5-year survival rate). The other women (35%) in the same sample had poorly-differentiated tumours (62.5% G_3), with a propensity to deeper invasion of the myometrium and a high frequency of metastasis to the pelvic lymph nodes (27.8%). This group also had a decreased sensitivity to progestogens (42.5%), and a doubtful prognosis (58.8% 5-year survival rate). Thus, the two types of endometrial cancer need tailored management and follow-up. Prevention of obesity would benefit the incidence of both cancers, although the association of BMI with endometrial cancer is stronger for type-1 [63]. Matias-Giui and Prat [74] pointed out that four major genetic changes are responsible for type-1 tumourigenesis: silencing of PTEN tumour suppressor gene, microsatellite instability, K-ras mutation, and alteration of beta-catenine gene. In addition, type-2 cancers are associated with a p53 mutation and an overexpression of the Her2/neu oncogene; they are more aggressive than type-1. Molecular classifications help to differentiate the two variants of endometrial cancer and help define management, e.g. distant metastasis is uncommon for the hypermutated MSI associated with low-risk type-1. A consideration of the differences in characteristics of the two cancer types can facilitate discussions on prognosis with the patient and her close family.

Rota et al. [75] in a pooled analysis of three case–control studies compared the association of BMI with endometrial cancer. They included 1449 patients with cancer and 3822 controls in their assessment. The authors found a non-linear relationship between obesity and endometrial cancer. Renehan et al. in their dose–response meta-analysis [63] of 24 studies (n = 17 710 cancers) found an overall risk ratio for endometrial cancer of 1.60 (95% CI, 1.52–1.68) for every 5 kg/m^2 increase in BMI in the linear model but their optimal model was non-linear with a knot at a BMI of 27 kg/m^2. The authors also found that when non-linearity was factored in, the risk of endometrial cancer at a BMI of 40 kg/m^2 was tenfold higher than that for women who had a BMI within the normal range. In Rota et al.'s study [75] the non-linearity between BMI and endometrial cancer became linear when extreme BMI values that were outliers were excluded from the evaluation; their findings then became similar to Renehan's non-linear model. Nonetheless, keeping outliers in may have added to the interpretation of their evaluation in other ways.

Table 8.2 illustrates the impact of obesity on the management of abdominal pain in a patient (3) who had been previously operated upon for endometrial hyperplasia, and another (4) pregnant woman who had had a previous emergency caesarean for failed instrumental delivery.

Table 8.2 Vignettes: The impact of obesity

	Vignette 3: Gynaecology—Abdominal pain, BMI 43: British Caucasian	**Vignette 4: Obstetrics—Abdominal pain with pregnancy, BMI 45: British Caucasian**
Presentation and management	*Mrs RM, a 38-year-old married volunteer for a Charity, with two teenage children, on a gynaecological follow-up visit* ◆ Mrs RM had complaints of intermittent abdomen pain off and on for 5 days; she had taken oral analgesia (tramadol, codeine), which were ineffective and she had had to take a tranquiliser, which the GP had prescribed for her continuing lack of sleep; the pain was similar to a 'stabbing type' on the right side of her abdomen; sometimes she was unable to get to a sitting position when lying down or standing up because of the pain and had to seek her partner's support; she had been 'sick' twice when the pain started but since then had only felt nauseated; Mrs RM felt feverish and had a vaginal discharge with pain 'below' so had avoided sex; she had no other symptoms; she had such episodes of pain for two months but pain-killers had worked previously; she had suffered intermittently from irritable bowel syndrome and feared that she could have cancer ◆ Haematological investigations sent by the GP showed a negative infection screen and tumour markers were negative; a recent pelvic ultrasound scan reported a small (2.5 × 3.0 cm) cyst in the right ovary ◆ In the past she had irregular heavy painful menstrual bleeding which did not respond to medication; an ultrasound scan report confirmed, a 'normal uterus with cervix, cervix shows no significant abnormality, the endometrium is proliferative and consistent with dates, myometrium is normal, the left ovary shows a cystic corpus luteum with numerous follicular cysts, normal left ovary, no malignancy or any other abnormality seen'; endometrial sampling revealed foci of 'atypical hyperplasia' of the endometrium; a decision for hysterectomy and salpingo-oophorectomy was taken with one ovary to be	*Ms GD, a 24-year-old housewife, para 1, cohabiting with her partner* ◆ Ms GD had smoked 10–15 cigarettes daily but had cut down to five cigarettes during pregnancy ◆ She complained of abdominal pain at 37 weeks' gestation, the pain was upper abdominal, of a 'burning' type with no radiation, and worse after a meal; she had nausea but no vomiting ◆ Her general examination was normal, she had a soft, obese abdomen with slight tenderness in the epigastrium but no scar tenderness; the fundus was of term size, the uterus soft and non-tender with a probable cephalic presentation and a regularly beating fetal heart; the ultrasound scan confirmed a cephalic presentation; a diagnosis of pregnancy-related dyspepsia was made and dietary advice with antacids given; she wanted to go home for she had been booked for an elective caesarean ◆ During this pregnancy, Ms GD had been hospitalised at seven weeks' gestation because of abdominal pain and a suspected ectopic pregnancy; imaging on abdominal ultrasound scan was unsatisfactory but a vaginal ultrasound scan produced a clear image that confirmed a single, intra-uterine fetal pole; the pain subsided and she was discharged ◆ She had two admissions since 22 weeks' gestation for abdominal pain with nausea and vomiting associated with urinary tract infection; maternal and fetal monitoring, and observations at each visit confirmed a normally progressing pregnancy though the baby appeared small for gestational age ◆ At each admission she appeared anxious but wanted to go home as soon as her symptoms subsided, and she was fit to go home on oral medication

(*continued*)

Table 8.2 Continued

	Vignette 3: Gynaecology—Abdominal pain, BMI 43: British Caucasian	Vignette 4: Obstetrics—Abdominal pain with pregnancy, BMI 45: British Caucasian
	left in if it looked healthy, for she was young but had completed her family; at the consultation, Mrs RM was overwhelmed at first but at a second visit with her husband, the indication, namely, the risk of malignancy from atypia was explained again, she accepted the decision; prior to the surgery, a CT scan of the abdomen and pelvis reported: 'axial contrast enhanced sections were taken from the diaphragm down to the ischial tuberosities, no abnormal soft tissue mass nor fluid collection in the abdomen, a small 30 × 25 mm diameter heterogeneous part cystic/part solid mass is seen deep in the pelvis?? endometriosis, no intravesicular lesion seen, no pelvic, no retroperitoneal lymphadenopathy, no sign of appendicitis, normal sized kidneys with no hydronephrosis, no focal hepatic lesion, the gall bladder distended normally, no bile stones seen, normal calibre bile ducts, no bile stones seen but they may be missed on CT, no pancreatic mass seen, normal sized spleen, no signs of intestinal obstruction, no pleural infusion, lung bases appear clear'; a hysterectomy and left salpingo-oophorectomy was carried out (five years before) that had confirmed atypical hyperplasia; there was no sign of malignancy in the uterus, cervix, left tube and ovary; her obesity (BMI 44) had made the operation technically difficult and postoperatively, she was slow to mobilise; routine care including anticoagulants were given, she was discharged on the fifth postoperative day but returned on the ninth day with leaking (serosanguinous fluid) from the wound and with fever; she was admitted, the wound dressed, and parental antibiotics given for 48 h, she was discharged on oral antibiotics; she needed a further attendance for a 'grumbling' pyrexia with wound infection; Mrs RM was prescribed a second course of antibiotics; dressings by the district nurse continued for two weeks; she was on follow-up for 18 months	◆ Her previous pregnancy at 20 years of age was unremarkable but a memory of an unsatisfactory labour experience with failed instrumental delivery and an emergency caesarean had persisted; screening questions confirmed dysphoric symptoms; postpartum she received midwifery/ health visitor and her GP's support; she was on antidepressants for 11 months, after which she seemed able to cope with her daily chores without medication or psychotherapy; her mother had helped her with her baby as her partner was often busy ◆ Ms GD was admitted at 38 weeks and 5 days for a planned caesarean birth ◆ She had no complaints and was looking forward to seeing her baby but was fed up with trying to get the right position to get to sleep; her booking BMI of 40 was now 45 ◆ At admission she had a blood pressure (BP) of 140/92 mmHg with the appropriate blood pressure measurement cuff, mild pedal oedema, and no proteinuria, the results of her fundoscopy were normal, bilateral limb reflexes were normal ◆ On examination, she had an obese non-tender abdomen, a longitudinal lie, cephalic presentation, and a normal fetal heart rate ◆ The anaesthetist's review was satisfactory and routine antacids, anticoagulants, antibiotics, and analgesics were prescribed ◆ Ms GD's blood pressure had settled to 135/88 mm Hg before sleep, and at the morning check before her caesarean she remained normotensive; antiembolic stockings had been provided but a Flowtron intermittent pneumatic therapy garment was applied prior to entering the operation theatre in order to prevent thrombosis

Table 8.2 Continued

	Vignette 3: Gynaecology—Abdominal pain, BMI 43: British Caucasian	Vignette 4: Obstetrics—Abdominal pain with pregnancy, BMI 45: British Caucasian
	◆ At this clinic visit, Mrs RM was afebrile, BMI was 43, her BP was 142/84 mmHg and her pulse 88 ◆ Examination confirmed an obese abdomen, with tenderness in the lower part with rebound but no guarding, the liver was not palpable, and no masses were felt; a speculum examination revealed a healthy, vaginal vault, well hitched up with non-purulent vaginal discharge, tenderness was elicited on the right side of the vault, a high vaginal swab for culture was taken ◆ A decision to admit for a diagnostic laparoscopy and treatment as indicated, was taken; Mrs RM consented but wanted her ovary to be left in, if possible ◆ The obese abdomen made laparoscopy technically difficult; dense adhesions of the intestine to the lower abdominal wall made visualisation of the right ovary impossible; a laparotomy had to be carried out with careful adhesiolysis at two spots where the omentum was adherent to the abdominal wall, which had prevented visualisation of the right ovarian fossa with the right ovary; a ruptured follicular cyst was noted with no active bleeding, a normal saline pelvic wash was given and the abdomen closed after a pelvic drain was left in ◆ The drain was removed the next day and she mobilised early; she felt reassured after the operation, and made a remarkable postoperative recovery; the cultures and cytology specimen sent for microbiology and pathology examination were negative; she was discharged on the fourth day on oral analgesia; she wanted to get back to her work	◆ Obesity made positioning for spinal anaesthesia a technical challenge but a successful entry followed two attempts with the senior consultant taking over; the largest sized theatre table just contained Ms GD and the usual wedge to tilt her to the left, and improve perfusion to the fetus was manageable; the risks of general anaesthesia were even higher due to her habitus, so spinal anaesthesia was given ◆ An additional assistant was provided for the surgery anticipating difficulties in reaching the baby; the abdominal incision had to reach the lower uterine segment after entering a three inch layer of adipose tissue under the panniculus; the panniculus was retracted upwards to the head end by a Montgomery strap, and the bladder was retracted downwards as routine to enable access to the lower uterine segment; the baby was delivered by a concerted effort of the obstetrician and assistants; haemostasis was assured by routine suturing of the uterine wound edges, and an intravenous oxytocic infusion started followed by an injection of prostaglandin F2α to sustain uterine contractions as the uterus was relaxing intermittently; the retractors were removed, an abdominal drain left in, and routine closure of the abdomen carried out ◆ Ms GD was delighted by her live, male baby weighing 2800 g and attempted to breast-feed; the caesarean wound was painful despite regular analgesia, and she could not breast-feed as planned; she had to change to bottle-feeding to satisfy the baby and was disappointed ◆ On the third postoperative day she complained of left calf pain; clinically there were signs of a deep venous thrombosis (DVT); the dose of the anticoagulant was changed from prophylactic to the therapeutic while awaiting investigations; DVT was excluded so she went back to the prophylactic dose of anticoagulants, and kept mobilising

(*continued*)

Table 8.2 Continued

	Vignette 3: Gynaecology—Abdominal pain, BMI 43: British Caucasian	**Vignette 4: Obstetrics—Abdominal pain with pregnancy, BMI 45: British Caucasian**
		◆ Ms GD felt ready to go home on the fifth postoperative day and was discharged with alerts to the community MW and her GP because of her increased risk of postpartum depression due to her past history ◆ She returned on the seventh postoperative day with discharge from the right end of the abdominal wound and felt feverish; she had fever, and there was a serosanguinous discharge from the right end of the wound; swabs were sent off for an infection screen; she was started on parenteral antibiotics with regular wound dressing ◆ On the third day, she was discharged on oral antibiotics and analgesia; the MW would continue with daily dressings until the discharge settled ◆ Otherwise her puerperium seemed to be progressing normally but she began to feel low at 4 weeks after delivery; the GP started counselling
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ Mrs RM was a caring child who wanted to help others; being the third child in a family of six she felt left out; she overindulged in sweets and savoury food ◆ She was interested in volunteering and became a volunteer for the cancer hospice; sometimes she felt she could not do enough for these patients before they passed away; she started overeating; her husband noted that there were crumbs on the table in the morning after the table was cleared every night; her dysphoria made her overeat ◆ Mrs RM had felt anxious and low after the diagnosis of the 'precancer' and the operation; she developed IBS after it—a psychosomatic condition	◆ Miss GD had a normal childhood but did not like school, as she found herself struggling with mathematics; the teacher was 'picking' on her and she began disliking going to school; her parents were 'too busy', and she began overeating ◆ She became interested in relationships at 16 and chose to work in a café rather than go to University after her GCSEs; she had been overweight but now was getting obese; she became close to her partner when in her late teens ◆ Ms GD was screened for depression after her first delivery; depression was confirmed and she was treated with counselling, and medication ◆ She feared for this second baby's welfare as he was of a much lower weight than her first child

Table 8.2 Continued

	Vignette 3: Gynaecology—Abdominal pain, BMI 43: British Caucasian	Vignette 4: Obstetrics—Abdominal pain with pregnancy, BMI 45: British Caucasian
Impact on the healthcare system	◆ Mrs RM had two operations, the first due to a premalignant condition and the second to investigate pain—both probably related to her obesity; it impacted on the healthcare system ◆ She was at risk of future psychosomatic disease with incurring costs for healthcare	◆ Ms GD had admissions during pregnancy and after delivery related to complications due to obesity; these healthcare costs could have been avoided if she had a normal habitus ◆ She 'felt a failure' when unable to breast-feed and was 'low' in mood; her GP would have to treat her until she recovered; this had incurring costs
Other forms of presentations and behaviour	◆ Obesity increases the risk of developing cancer or pregnancy complications as well as leading to cardiovascular and metabolic dysfunction ◆ Repeated self-referrals requiring out/inpatient hospital assessments or treatment could occur as well as an impact on the woman's psychosomatic health	

Learning points

Both Mrs RM and Ms GD were obese, and suffered from disease due to its complications; the obesity also interfered with the management of those complications. Mrs RM was managed appropriately [76] but the premalignant condition may not have arisen if she had not been obese. Similarly, Ms GD suffered from complications related to childbearing because of her obesity. Medical/social interventions may be required for obesity and its complications, whether related to malignancy or childbearing; this can also impact on close family. Medical personnel need to be aware that modifiable biopsychosociocultural factors can initiate obesity, and then maintain it due to psychosomatic interactions. Prevention of diseases by promoting a normal BMI should be aimed for.

Preventing/treating obesity to prevent endometrial cancer

Several biological mechanisms operate in the association between adiposity and endometrial cancer, with not only the adipose tissue but also the dysfunctional state of the pre-tumour adipose environment being implicated. Preventing endometrial cancer in those with a raised BMI would entail losing weight primarily through lifestyle changes. This appears to be of greater significance in the obese when compared with the overweight members in any sample.

Initiating lifestyle changes that are socioculturally acceptable is conducive to reaching and maintaining a normal weight, which would thus prevent the transformation of the internal milieu that favours the development of endometrial cancer, as there is an inverse relationship between obesity and quality-of-life (QoL). Smits et al. [77], in their evaluation of cancer survivors treated for early stage endometrial cancer, found that both physical and psychosocial well-being, besides functionality, were inversely related to BMI. Obesity gave these women a social disadvantage, as their peers could discriminate against them because of it. Moreover, the restrictions imposed on their mobility by being overweight could prevent them from pursuing interests independently that could enhance their health. Also, QoL can be further restricted because of the comorbidities associated with obesity such as cardiovascular disease or metabolic syndrome. Reverting to a

lower BMI is therefore advantageous but the implementation of a weight loss programme requires a concerted effort by the patient and this may include involving the close family in order to promote such behaviour. This is of greater significance for patients with type-1 endometrial cancers, as many are relatively young compared with those with type-2 cancers. A relatively longer cancer-free survival period needs a concomitant enhanced QoL.

Laskey et al. [78] emphasise that obesity not only increases the risk of endometrial cancer but also cardiovascular disease; the latter can be fatal for many who survive the treatment of the endometrial cancer. The age-adjusted mortality for endometrial cancer is 2/100 000 with the type-1 oestrogen dependent, low-grade tumours that are associated with obesity; these constitute 80% of all endometrial cancers, and have a >90% 5-year survival. Type-2 are not oestrogen dependent and not commonly associated with obesity; they have a worse 5-year survival rate of only 40–60%, and affect a slightly older population than those with type-1 cancer. Obesity is responsible for increasing the amount of bioavailability of oestrogen and for initiating tumour growth, therefore, its association with the individual's central obesity makes waist circumference a useful parameter for predicting endometrial cancer. Kabat et al. [79] reported that making lifestyle changes to reduce obesity can be hindered by the personal opinions of young patients treated for cancer who often believe that the hysterectomy and salpingo-oophorectomy has cured them of cancer so reducing their obesity is no longer of any consequence. Health education to make them aware of the other advantages of weight loss would be of benefit in motivating these individuals to lose weight. In another report, Von Gruenigen et al. [80] observed that women treated for endometrial cancer who were obese had a lower overall survival rate, and were 25% more likely to die of other causes than that directly related to the cancer when compared with those with a BMI of <40. Carrying out bariatric surgery to reduce weight in the obese female, and thus reducing the risk of endometrial cancer (HR = 0.22; CI, 0.1–0.40) has been discussed by Adams et al. [81].

Lifestyle alterations to prevent obesity

Lifestyle alterations to prevent obesity or reduce its impact come in a variety of forms. Many of the beneficial methods are free at source, and would be cost-effective if they were successful in preventing the individual from becoming overweight or successful in achieving weight loss if obese. These methods include exercise, dancing, walking, cycling, sport, yoga, and other physical pursuits. Voluntarily participating in a personalised activity regime to promote weight loss may be suitable for some who want flexible regimes to suit them, whereas others may prefer supervised activities in the company of others, though all have to consistently allocate time for these. Habits are inculcated since babyhood, and the child's early environment has an important role to play. There is limited evidence that breast-feeding can protect against childhood obesity, and the later overweight habitus [82,83]. Food habits are influenced initially by the child's parents/close relatives and friends, and later by social media/advertisements, and teachers, so healthy eating and exercise to promote positive health often have their origins in childhood. However, seeking healthier pursuits is not always built into a relentless daily work schedule.

Bariatric surgery to reduce the impact of obesity

Conversely, where lifestyle alterations for weight reduction in the obese cannot result in sustained weight loss, bariatric surgery is an option. It has been recently promoted for BMI reduction, which has the additional benefit of preventing endometrial cancer, and its recurrence. However, bariatric surgery needs to be evaluated in the context of its suitability for each individual. Similarly, psychosociocultural factors need to be taken into account, as they were most likely involved in the causation of the obesity, and would be instrumental in the patient's recovery after surgery, and any of its complications.

Robson et al. [84] reported that among their Australian population, obesity increased over the last decade by 60% in those of 25–35 years of age and by 80% in those between 35 and 44 years; 3% had a BMI of ≥40kg/m^2 in 2012. This indicates that more action is required to prevent obesity, and thus its adverse consequences from acting on these women, including any effects on their offspring. The authors further comment that losing weight is difficult and behavioural modification with or without pharmacological treatments can bring about only modest changes (i.e. about 3 kg). The studies included in the review lack clarity about the duration of the effect of behaviour modification, with few going beyond 10 years. Therefore, surgical approaches, such as bariatric surgery, are gaining attention. Bariatric surgery developed in the 1950s, when it was observed that resecting and shortening the small intestine resulted in weight loss due to malabsorption. One of the types of bariatric surgery—the malabsorption type, known as the Roux-en-Y bypass or biliopancreatic diversion, are based on the previous observations about small intestinal resection. The other type—the restrictive procedure, reduces the capacity of the stomach, and includes the laparoscopic adjustable gastric banding and sleeve gastrectomy, which are easier to perform. Malabsorptive procedures by altering the effective length of the small intestine have an additional effect on the proximal duodenum, resulting in altered neuroendocrine function. The gastric band may need frequent adjustment and liquid/semisolid food, such as ice-cream, can pass through. Colquitt et al. [85], in a systematic review of non-pregnant adults, reported that bariatric surgery was a better option than non-surgical methods but the authors caution that in these studies, adverse outcomes were under-reported. Moreover, re-operation rates were ignored, and the follow-up visits of their patients were only up to two years.

Regarding pregnancy, there is no evidence that bariatric surgery reduces pregnancy loss, and improves conception rates. Also, because of a rapid change in nutritional status following bariatric surgery, waiting for 1–2 years following surgery before trying to conceive, has been suggested. In managing a pregnancy after gastric banding, there is no clear guideline about whether one should deflate or inflate during pregnancy, although usually, deflation is carried out. It is reported that such surgery reduces the risk of gestational diabetes, hypertension, and macrosomia but the magnitude of the risk reduction is not as great as was hoped [84]. The effect on birth outcomes such as caesarean section is not known, and babies are at an increased risk of growth restriction and being born preterm. Cornthwaite et al. [86] comment that only a few clinical trials have studied pregnancy after bariatric surgery, so our understanding is based on case reports and observational studies, which have their design limitations.

Certain studies have considered the outcome of pregnancies before and after bariatric surgery, but have been unable to separate the impact of weight loss from the impact of the surgery. Malabsorptive bariatric surgery leads to nutritional deficiencies more often than restrictive surgery [86]. Concerns have been raised about fetal morbidity, even if there may be a reduction of gestational diabetes, and hypertension in the mother. There may be detrimental effects of intestinal hernia and/or nutrition deficiencies in the mother. The psychosocial impact of pregnancy with a gastric band has received scant attention; the preliminary reports of the ENGAGE (ENquiry into women with Gastric banding in pregnancy to Guide management and improve Experience) indicate that information, guidance and support in pregnancy is limited with further clarity being required. However, in this study most had the gastric band inserted privately, so the sample may not have been representative of the overall population. The continuing national prospective study in the UK, using the 'Obstetrician Surveillance System' (UKOSS) to investigate pregnancy after gastric banding, may add to this knowledge when its findings are reported. The authors [86] advocate that these women should receive prepregnancy advice, and be screened and treated for nutritional deficiencies; prescribed low-dose aspirin and vitamin supplementation; screened for gestational diabetes; have serial growth

scans along with closer blood pressure, and urinalysis surveillance. Discussions about induction of labour at term should be part of the dialogue with the pregnant woman and her partner. A systemic review has reported a failure of gastric bands in 20–30% patients [87] in the study samples that they have included.

Notwithstanding the complexities of bariatric surgery and the current status of limited enquiry into any of its detrimental effects, studies have continued to focus on the physical issues, and not the psychological aspects. Hence, the psychosomatic perspective needs further evaluation. One of the reasons for low uptake of bariatric surgery could be the costs, especially where governments and insurance companies [84] do not provide the funding for the procedure, as well as the aftercare. Furthermore, comparing the cost-effectiveness of bariatric surgery against other alternative options has not been studied comprehensively. The morbidly obese can be considered for bariatric surgery under the NHS, UK, if a structured weight loss programme has been unable to reduce weight and maintain the weight reduction, despite being consistently followed by the individual [88]. A Canadian review [89] evaluated the available evidence on the direct/indirect costs of bariatric surgery on non-pregnant patients, and concluded that limited information made it impossible to assess generalisability of costs and outcomes/gains. The impact of postings on social media that are critical of procedures/surgeons and hospitals, besides internet 'blogs' and 'chat rooms' have yet to be evaluated in this context [84] though such factors may influence patient uptake of such surgery.

Finally, Ligibel et al. and the American Society of Clinical Oncology [90] have provided guidance to aid physicians in advising women whom they have treated for endometrial cancer regarding weight reduction; the guide can additionally help those physicians who are overweight themselves in not feeling hypocritical when advising obese/overweight patients, regarding their weight reducing regime.

The impact of obesity on childbearing

This is a current issue with obesity having become a global epidemic. A concerted multidisciplinary effort to reduce the effects of obesity on the mother and her child are needed, and the International Weight Management in Pregnancy Collaboration Group has made a position statement [91].

Impact during pregnancy on the adolescent/child

Studies on pregnancy during adolescence report on the needs exclusive to the adolescent gravidae, who should receive tailored care. They are at an increased risk of complications [92] such as hypertensive diseases of pregnancy, preterm delivery, low birthweight, and neonatal/infant morbidity and mortality. In the obese adolescent, these problems can be further magnified if she conceives. Additionally, a transgenerational effect promoting obesity can be carried over to the fetus of the obese pregnant mother. Gaillard et al. [93] reported, in a population-based prospective cohort study in Australia (sample, $n = 1392$), that a higher prepregnancy BMI was associated with a higher BMI, waist circumference, and waist-to-hip ratio in their adolescent children, who were followed from birth to 17 years of age. A higher prepregnancy BMI and early pregnancy weight gain was associated with a risk of increased adiposity, along with an adverse cardiometabolic profile in the 17-year-olds; the association with the prepregnancy period was stronger than that during pregnancy (OR 1.57; 95% CI, 1.33–1.85 and OR 1.23; 95% CI, 1.03–1.47, respectively). Moreover, these adolescents had a higher waist circumference, waist-to-hip ratio, systolic blood pressure, insulin, glucose, and HOMA-IR (insulin resistance) levels. Part of the study findings were similar to the British mother-child study by Fraser et al.

[94], who found that in their sample (n = 5154), the gestational weight gain during the first 14 weeks was associated with the BMI, waist circumference, and fat mass of their offspring at 9 years. Similarly, Margerison-Zilko et al. [95] in their sample (n = 5908) found an association of early pregnancy weight gain with adverse cardiometabolic effects in their children at 6 years of age. Karachailiou et al. [96] found an association in their mother-child pairs (n = 977) between first trimester maternal weight gain and childhood obesity at 2–4 years of age. Increased fat deposition during pregnancy may lead to higher placental transfer of nutrients, and subsequent programming of the offspring's adiposity, along with an adverse cardiometabolic profile [97]. Therefore, prevention of the transgenerational effect of obesity on several health parameters during adulthood requires early action to prevent the child from becoming an obese teenager or obese adult mother.

Impact on ovulation and fecundity

An obese woman can ovulate normally and be fertile, yet she may have a fetal loss before 24 weeks' gestation—a miscarriage, repeatedly. Such a loss of three or more consecutive pregnancies is known as recurrent miscarriage in Europe, whereas the American Society considers the loss of two or more pregnancies as recurrent miscarriage. Teklenburg et al. observed that pregnancy loss is associated with the implantation of embryos with chromosomally abnormal cells and/or biosensory failure of the decidualised endometrium [98], which interfere with implantation. Yet, the underlying causes of recurrent miscarriage remain elusive. The probability of achieving pregnancy in one menstrual cycle, namely, the average fecundity rate, was 20%; it was 1–5% in the subfertile but 60% in the superfertile, with the obese being included in the latter category [99]. Bhandari et al. reported [100] on the reproductive failures due to recurrent miscarriage, assessed at an implantation clinic. They analysed the impact of obesity on the time-to-pregnancy interval in women with recurrent miscarriage, when compared with normal weight women, and the patterns of pregnancy loss in women with such a history. They found that an obesogenic environment may have a negative influence on the endometrium, with resultant early miscarriages of euploid fetuses. Their study was limited by recall bias, and age at presentation may not have reflected the age at pregnancy loss, due to the varying testing protocols from referral clinics. The possible effect of obesity on the preparation for pregnancy by the endometrium remains controversial however, with studies reporting for [101] and against [102] this hypothesis. Ledger, in a commentary [103] remarks that weight loss would probably not prevent such miscarriages in the obese as, in his opinion, these miscarriages could be due to subtle chromosomal abnormalities that could only be detected by microarray comparative genomic hybridisation and next generation sequencing, which were not used in the study by Bhandari et al. [100].

Conversely, obesity can reduce fecundity and result in infertility in patients with polycystic ovarian syndrome (PCOS). PCOS occurs in 5–10% of women and often presents with menstrual irregularities [104] and hirsutism. Patients with PCOS have polycystic ovarian morphology, along with ovarian dysfunction and hyperandrogenism with elevated serum levels of LH, in addition to insulin resistance. Insulin resistance leads to the reproductive and metabolic features of PCOS. Besides the gynaecological symptoms and features of hyperandrogenism, the women are at increased risk of type 2 diabetes and cardiovascular events. Markers such as adipocytokines, irisin, PAI-1, and zonulin are associated with insulin resistance, as are potential new markers such as resistin, leptin, kisspeptin, and ghrelin, but the significance of the latter is controversial. Weight reduction is of immense benefit in reversing the pathological changes and facilitating ovulation in the obese who are anovulatory. Wild et al. [105] in a literature review, concluded

that women were at risk of cardiovascular diseases if they had PCOS with obesity, hypertension, impaired glucose tolerance, dyslipidaemia, subclinical vascular disease, and were smokers. They were at a higher risk of cardiovascular diseases if they had PCOS along with metabolic syndrome or type 2 diabetes. These obese women could also be at risk of mood disorders. This calls for early implementation of lifestyle changes to reduce weight and improve the metabolic profile, thereby preventing cardiovascular disease and promoting well-being. Weight reduction also improves fecundity in those who have anovulation, and facilitates implantation of the embryo.

Adolescents can have polycystic ovarian morphology detected on a routine ultrasonography of the pelvis without a metabolic abnormality or anovulation, and often remain healthy [106]. This would indicate that no treatment is needed based solely on the chance imaging of ovarian morphology in this young group. However, the significance in adolescents of symptoms/signs of anovulatory cycles, hyperandrogenemia, hyperandrogenism (hirsutism, acne, or alopecia), or ovarian findings on ultrasound, is not established. These clinical features can regress with time, thereby their clinical significance is unclear [107], and diagnostic features of PCOS in adolescents have yet to be established. Furthermore, individualisation of management is necessary, with reduction of weight and smoking if indicated in the obese; behavioural changes could have a beneficial effect on metabolism and physical and mental well-being, thus there is a need for such attitudes in health promotion. Paying attention to gut microbiota may be beneficial but needs further research. Medication such as metformin or antidepressants with psychotherapy can have a role in patients who have the adverse psychosomatic manifestations of PCOS. Ovarian drilling or bariatric surgery can also have a role in management, if lifestyle changes/medical management have no or limited impact on obesity and subfertility, and the patient is keen to consider invasive procedures with uncertain outcomes.

Impact on subcutaneous fat thickness and obstetric outcomes

Kershaw and Flier reported [108] that adipose tissue contains stromovascular cells, connective tissue matrix, nerve tissue, and immune cells, as well as adipocytes, and function as a neuroendocrine organ. It responds to the messages from the central nervous system and hypothalamopituitary axis (see Chapter 1), along with responses to local factors, such as cytokines, adiponectin, complement components, plasminogen activator, resistin, and hormones of the renin-angiotensin system. Adipose tissue also metabolises sex steroids and glucocorticoids, so has overarching effects affecting metabolism, and inflammation. Over accumulation of adipose tissue, as in the obese, can therefore cause chronic inflammatory effects. The metabolic effects and inflammation during pregnancy can add to the existing effects of obesity [109], and lead to complications such as metabolic syndrome, pre-eclampsia, fetal and neonatal effects, haemorrhage, and wound problems. While central obesity increases adverse effects on the cardiovascular system and is associated with diabetes [110], peripheral obesity is protective. Fox et al. [111] reported a correlation between abdominal subcutaneous fat thickness (SFT) and cardiovascular diseases and obesity, though visceral fat was more strongly related. In a prospective longitudinal study, Kennedy et al. [112] investigated (sample, $n = 1510$) the correlation of SFT measured by ultrasound during the first (11–14 weeks) and second (18–22 weeks) trimesters at 21.2 mm and 20.3 mm, respectively, and associated these with pregnancy complications. Of the 1385 women who had complete datasets, 54% were overweight or obese. A correlation of SFT with gestational diabetes, hypertensive disease, preterm delivery, low birthweight, caesarean birth, neonatal respiratory distress syndrome, and admission to the neonatal intensive care unit was confirmed. SFT was a better predictor of adverse pregnancy outcomes than BMI, with the authors suggesting that the SFT was a better predictor of central obesity.

Impact on pregnancy and childbirth

Obesity is a risk factor for preterm labour, namely delivery before 37 completed weeks of pregnancy. It is not yet clear how obesity initiates preterm labour but inflammatory, neuroendocrine, and lifestyle factors [113] are probably implicated. Adipose tissue produces adipokines that stimulate secretion of proinflammatory cytokines along with gestational weight gain [114], which in turn increases the likelihood of preterm labour. Faucher et al. reviewed the relationship between gestational weight gain above the Institute of Medicine's (IOM) recommendations and preterm birth in the obese [115], and assessed whether there were differences in risk by the class of obesity. The authors observed that it is widely recognised that an increased risk of preterm labour in the obese relates to medical complications of pregnancy. The conclusion from the four studies meeting the inclusion criteria from the USA (n = 10 171) and one from Peru, was that obese women with gestational weight gain above that recommended by the IOM (>9 kg total weight gain) were at an increased risk of preterm birth (adjusted OR 1.54; 95% CI, 1.09–2.16). There was considerable heterogeneity between the studies, implying a need for further investigations.

Brownfoot et al. [116], in a randomised controlled trial from Australia, investigated whether routine weighing at each antenatal visit would lead to a difference in gestational weight gain, and weight gain within the IOM recommendations. The intervention was by weighing at each visit, followed by counselling (n = 386) by the clinician, while the control group (n = 396) had routine care with weighing at booking and at 36 weeks. The secondary outcome was maternal and neonatal morbidity. There was no significant difference in weight between the intervention (0.54 kg/week) and the control (P = 0.53) (P = 0.63) groups respectively, nor in the excessive weight gain beyond that recommended by the IOM (75% in the intervention and 71% in the control; P = 0.21). Secondary outcomes between the groups were similar. The authors concluded that regular weighing was of no benefit in altering weight gain. Preston and Norman [117] in their commentary, point out that the large sample size in Brownfoot et al.'s trial is its strength, along with their use of calibrated scales in addition to the clinician's discussion with the patients in the intervention group. Nonetheless, blind allocation was not possible and whether both groups had standard advice was unclear. However, if repeated weighing is of no value, alternative measures to minimise weight gain are needed. Notwithstanding, there are other benefits of repeat weighing such as prescribing drugs in late pregnancy, and feedback is all important to women who are planning a future pregnancy.

Impact on maternal and perinatal outcomes

Lee and colleagues reported from a retrospective, cohort study [118] that compared perinatal outcomes between elective induction of labour at term or expectant management of obese women carrying singletons (n = 74 725). Their maternal outcome measures included delivery mode, severe perineal lacerations, postpartum haemorrhage, chorioamnionitis and fetal macrosomia, shoulder dystocia, brachial plexus injury, and respiratory distress syndrome. Induction of labour at 37–40 weeks reduced the odds of caesarean delivery, without increasing the risks of adverse outcomes in the puerperium when compared with expectant management. When labour was electively induced in nulliparae at 37 weeks, the odds of caesarean delivery were lower (OR 0.55; 95% CI, 0.34–0.90) and at 39 weeks (OR 0.77; 95% CI, 0.63–0.95), when compared with expectant management. For those with expectant management of labour at 37 weeks, the findings were OR 0.39; 95% CI, 0.24–0.64, and at 39 weeks OR 0.67; 95% CI, 0.56–0.81. Elective induction of labour at 39 weeks decreased the odds of caesarean for both nulliparae and multiparous women. Moreover, there was a reduction of macrosomia in the mothers who had elective induction of labour but there were no differences between groups regarding operative vaginal delivery or

perineal lacerations, and the neonatal parameters. Thus, induction of labour for obese gravidae seems a viable option but further evaluation is proposed.

Dodd et al. evaluated neonatal anthropometry [119] after providing antenatal dietary and lifestyle advice to their pregnant sample in Australia. This was a randomised controlled trial with women randomised to either lifestyle advice about diet, exercise, and behavioural strategies delivered by a research dietician during pregnancy, or receiving standard care. Secondary outcome measures included measuring skinfold thickness, neonate body circumference, and bioimpedance analysis of fat-free mass. Measurements were obtained from 488 neonates of mothers in the Lifestyle Advice Group and 482 from mothers of the Standard Care Group. The authors concluded that there was no difference in the neonates born to mothers who were overweight/obese, and were given lifestyle advice from those born to women who received standard care. Maternal obesity and infant outcomes were part of the discussions of a recent congress, where it was highlighted that although there was an association between maternal obesity and infant outcomes, the evidence was limited for a causal relationship [120]; further research is warranted.

The preceding deliberations confirm the deleterious effect of obesity on childbearing with considerable morbidity on the individual affected, which can also impact on the conceptus and future offspring. Primary prevention by practising suitable lifestyle activities that promote a normal BMI, and are economically sound, besides tertiary prevention by bariatric surgery, which is expensive, have been discussed.

According to the WHO, the global epidemic of obesity has generated a plethora of preventable disease conditions in its wake. Obesity now affects 41 million children under the age of five, worldwide [121]. In their directive on population-based approaches to childhood obesity, the WHO has identified the need for member states to curb childhood obesity [122] by within-government policies for prevention and intervention, population-wide policies through laws and social marketing campaigns, and community-based interventions tailored to the local environment. Prevention of obesity in childhood could lower its frequency in teenagers and adults, and the unnecessary drain on the economy from the treatments related to it, along with the management of diseases due to its psychosomatic repercussions. The woman is receptive, and accessible during pregnancy and the postpartum, to advice on dietary modification and exercise; such advice would also benefit a supportive partner. Hence, promoting health education for the couple along with inculcation of such values into the infant/child would be a cost-effective strategy to prevent obesity, including its transgenerational effects. A campaign aimed at vulnerable subgroups [33], such as teenagers and oral contraceptive users, to reduce HPV infection by using barrier contraceptives has also been advocated; it could work in the motivated. The promotion of the HPV vaccination in 11–12-year-old children as a universal prophylaxis for cervical cancer in developed countries has been questioned [123,124], and ethical violations in vaccine promotion in low- and middle-income populations have been reported [125].

Conclusions

Primary and secondary prevention of cancer and obesity may be an economically sound approach to promoting positive psychosomatic health but such healthcare provision may not be available to many women, globally. This results in tertiary prevention, and treatment of preventable diseases along with their complications, in many populations. Furthermore, sociocultural deterrents need further recognition to effectively reduce the local disease burden of gynaecological cancer and obesity.

Reducing the prevalence of cervical cancer by preventing carcinogenic HPV infection through primary and secondary prevention has already helped reduce its incidence in the West. This needs promotion in low–middle-income countries, yet the practicalities of carrying out such forms of women's health promotion under challenging circumstances, and the inflexible sociocultural

norms for adolescents and adults within diverse populations, requires local, national, and global collaborations. HPV vaccination as a form of primary prevention was developed against 70% of carcinogenic HPV subtypes, thus advice for additional protection against infection by using barrier methods remains relevant, globally. Concomitant cervical screening also needs to be maintained for HPV genotypes not targeted in the vaccine that could infect and cause CIN. Moreover, in the vaccinated, adhering to condom protection should continue, as the protection against infection by HPV subtypes included in the vaccine run out within a decade, and the need for a booster dose is yet to be evaluated.

Obesity is thought to play a major aetiological role in the development of endometrioid tumours but not of non-endometrioid tumours of the uterus. Therefore, the prevention of obesity, and limiting harm by weight reduction, is a valuable proposition for reducing the incidence of endometrial cancer. Lifestyle alterations should be practised by all who are overweight. Behavioural change for reducing obesity would be worthwhile both in terms of current health promotion, and our responsibility towards promoting the health of future generations. Prudent use of our limited healthcare resources is better taught by example. Prevention of cancer and obesity in women and adolescents by earlier action on the overweight habitus should be prime examples.

Measures to prevent being overweight and obese should also be prioritised to reduce its major impact on the physical, mental, and social health associated with these conditions; the additional benefit in preventing the metabolic syndrome and cardiovascular disease with detrimental mind–body interactions, reinforces its significance. Over-screening or over-enthusiastic treatment, which may cause psychological/physical harm without necessarily benefiting the individual, merits research. A cautious management approach matched to the person's biopsychosociocultural circumstances should satisfy the individual, and limit unnecessary expenditure on treatment. In relation to cancer and obesity, disease prevention seems more cost-effective than cure. Investigation into psychosomatic interactions that are associated with cancer and obesity, including the initiation by biopsychosociocultural factors, deserves wider recognition.

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Chapter 9

Vulval pain

Allan B. MacLean

Introduction

Vulval pain can be defined as pain related to the vulval tissue, which includes the labia majora, labia minora, clitoris, hymen, vestibule, urethral opening, greater vestibular or Bartholin glands, minor vestibular glands, and paraurethral glands. Vulval pain may be acute (and outside this chapter's remit) or chronic, defined as lasting for at least three months [1]. There have been a multitude of terms used in the literature to describe idiopathic vulval pain syndromes. These have been summarised recently in MacLean and Siddiqui's review article [2].

The most recent terminology [3] and classification from the International Society for the Study of Vulvovaginal Disease (ISSVD), which is a revised version of the previous classification [4], of persistent vulvar pain, is:

A. Vulvar pain related to a specific disorder*
   1. Infectious: candidiasis, herpes infection, bacterial vaginosis, hidradenitis suppurativa, etc.
   2. Inflammatory: lichen sclerosus, lichen planus, Crohn's disease, aphthous ulcers, etc.
   3. Neoplastic: cancer, intraepithelial neoplasia, Paget's disease, etc.
   4. Neurological: herpes neuralgesia, spinal nerve compression, spinal stenosis, pudendal neuralgia, etc.
   5. Trauma (e.g. female genital cutting, obstetrical)
   6. Iatrogenic (e.g. postoperative, chemotherapy, radiation)
   7. Hormonal deficiencies (e.g. genito-urinary syndrome of menopause vulvovaginal atrophy, lactational amenorrhoea)

B. Vulvodynia is vulvar pain of at least three months' duration, without a clear identifiable cause, which may have potential associated factors. Descriptors are as follows:
   1. Localised (e.g. vestibulodynia, clitorodynia) or generalised or mixed (localised and generalised)
   2. Provoked (e.g. insertional, contact) or spontaneous or mixed (provoked and spontaneous)
   3. Onset (primary or secondary)
   4. Temporal pattern (intermittent, persistent, constant, immediate, delayed).

The classification [4] includes the following footnote: vulvodynia is defined as vulval discomfort, most often described as burning pain, occurring in the absence of relevant visible findings or a specific, clinically identifiable neurological disorder. Specifically, a peripheral neuropathy (e.g. related to herpes zoster or simplex) should be excluded based on the list of associated symptoms such as sphincter dysfunction, weakness in the lower limbs or sensory changes such as hypoaesthesia or anaesthesia involving the areas of discomfort.

* Women may have both a specific disorder (e.g. lichen sclerosus) and vulvodynia.

Vulvodynia as represented under the term 'vulval pain syndrome' in the Classification of the International Society for the Study of Pain. 'Relevant visible findings' takes into account the following considerations:

1. Diffuse and periductal vestibular erythema (bilateral, usually symmetrical erythema localised around the openings of Bartholin's glands and minute epithelial depressions) is a normal finding, and is therefore not responsible for vulval discomfort.
2. Disorders such as genital warts, naevi, cysts etc. may be present on the vulva but not be relevant, i.e. not necessarily responsible for vulval discomfort.

'Generalised' specifies involvement of the whole vulva, and 'localised' specifies involvement of a portion of the vulva such as the vestibule, clitoris, hemivulva, etc. 'Unprovoked' (spontaneous), means that the discomfort occurs spontaneously without a specific physical trigger; 'provoked' means that the discomfort is triggered by physical contact. Such contact may be sexual, non-sexual, or both. Examples include sexual intercourse or intromission, tampon insertion, fingertip pressure, pressure or contact with certain items of clothing including underwear, tight jeans, Lycra sportswear, gynaecological examination, cotton-tipped applicator pressure, etc. [4].

Recent studies [5,6] have subdivided those who have had symptoms from first provocation (primary vestibulodynia) from those who have had no pain with tampon use or intercourse previously (secondary vestibulodynia), and suggested that there may be different mechanisms responsible for each set.

These terms do overlap with another frequently used description of 'vaginismus', defined as 'the persistent or recurrent difficulty of the woman to allow vaginal entry of a penis, a finger, or any object, despite the woman's expressed wish to do so' [7,8]. The use of similar or overlapping terms has not helped clearer definitions or understanding of the causes, diagnosis, or management.

The correct term using the Greek prefix and suffix should not be 'vulvodynia' (which is a Latin–Greek hybrid) but rather 'aidoiodynia' [9], in Greek terminology. However, such a term is likely to inhibit rather than promote understanding among those unfamiliar with its etymology.

Over the years, factors that were claimed to have a causative role in vulvodynia have later been found as only coincidental [3]. This may also happen with the associated factors in the current terminology.

Prevalence

Because of the nature of vulvodynia, the lack of clinical signs and confusing nomenclature, the prevalence of vulvodynia in the general population is largely unknown. Harlow and Stewart [10] surveyed a group of almost 5000 women, aged 18–64, in the Boston area. They achieved a 68% response rate to their questionnaire, and found 16% reported histories of chronic vulval burning, knifelike or sharp pain, or pain on contact, at some point during their lifetime. They showed no difference in prevalence among white and African-American women, but Hispanic women were 80% more likely than white women to have experienced chronic vulval pain. Only 54% of those with chronic unexplained pain sought treatment, and those who did visited up to five different doctors. Of those seeking an opinion, 9% were given a diagnosis of chronic vulval pain, the remainder being attributed to vaginal or pelvic infections or other pathology. A total of 7% of women surveyed had vulval pain at the time. A more recent population study by Harlow et al., found that 7–8% of women reaching 40 years of age who were living in the Boston and Minneapolis/St. Paul areas of the USA reported vulval pain consistent with vulvodynia [11].

Bachmann et al. [12] surveyed similar women in New Jersey and identified 4% that reported a history of vulval pain in the 6 months before the survey, and an almost 10% lifetime prevalence. When reviewed one year after the first questionnaire, 50% of those who had reported vulvodynia were still having pain and the majority had persistent pain over the year [13]. Additionally, 5% of those who were previously asymptomatic had symptoms of vulvodynia that had developed over the 12 months [14]. Danielsson et al. [15] reported that of 3017 Swedish women surveyed, 9.3% had experienced dyspareunia for more than six months; the prevalence was 13% in 20–29-year-old, and 6.5% for 50–60-year-old women.

Clinical findings

The latest ISSVD classification has attempted to differentiate those patients with pain due to infection, inflammation, neoplasia, neurological cause, trauma, iatrogenic, and hormonal reasons, and those with vulvodynia. The clinical or biopsy features due to the first group have not been addressed in this chapter.

Women with generalised vulvodynia usually have no clinical vulval findings. Women with localised provoked vulvodynia/vestibulodynia, as defined by Friedrich [16], have two principal findings: vestibular erythema and Q-tip pressure tenderness. Unfortunately, these findings are not specific. Nevertheless, van Beurden et al. [17] examined 40 healthy volunteers without vulval symptoms and found vestibular erythema in 17 (43%), with a positive touch test in 9 of these 17 women. Eliciting vestibular tenderness by pressing with a Q-tip swab is an inconsistent clinical technique. The same area may be less or more painful from day-to-day, or one examination to the next. Several items of equipment have been designed, and described to provide a more quantified assessment of pain threshold [18–20].

Johannesson et al. [21] used such a device (algometer) to demonstrate that women with provoked vulvodynia had lower pain thresholds over their anterior tibial and deltoid muscles. Burrows et al. [22] used an analgesiometer to measure sensory and pain thresholds in the vulval vestibule, deltoid, and umbilicus: women with pain provoked by their initial event (primary vestibulodynia) had a significantly lower umbilical pain threshold (higher level of umbilical sensitivity) compared with women with secondary vestibulodynia and controls. Foster et al. [23] have advocated the use of 'the tampon test' as an outcome measure of the response to treatment in clinical trials of managing vulvodynia.

Biopsy findings

There are descriptions in the following sections on biopsy findings when looking for inflammation, sex steroid receptor presence, and markers of neural proliferation.

Those biopsies were justified because they were taken for research purposes, but the general impression is that biopsy is not necessary for a diagnosis of vulvodynia, e.g. in the guidelines on the management of vulvodynia published by the British Society for the Study of Vulval Disease [24]. However, Regauer and Eberz [25] encourage the use of biopsy in assessing women with a potential diagnosis of vulvodynia. They describe patients referred for management of vulvodynia where biopsy or re-biopsy found lichen sclerosus, lichen planus, features of chronic irritant dermatitis and psoriasis, vulval intraepithelial neoplasia and a neurinoma. Several patients were referred for a second opinion in the management of presumed vulvodynia, where significant pathology was found in directed biopsies. Nonetheless, the value of biopsy in determining treatment seems unhelpful: Brokenshire et al. [26] report that histology is unable to predict which patients will respond to surgery.

Other findings

Pelvic floor electromyography was investigated by White et al. [27] in women with vestibulitis to show consistent features of pelvic floor muscle instability, poor muscle recovery after contraction, elevated resting baseline plus either reduced frequency or reduced muscle contraction strength. Women with dysaesthetic vulvodynia (generalised unprovoked vulvodynia) were more likely to have altered tonic, phasic and endurance of pelvic floor muscle contractions compared with asymptomatic women [28,29].

The causes of vulvodynia

Infection

Many of the women who present with vulval pain attribute their symptoms to yeast or *Candida* infections, which elude detection in swabs, and no longer respond to over-the-counter creams or antifungal treatments. Nguyen et al. [30] have shown a significant association with antecedent urogenital infections without there being a single causative organism. The possibility that human papillomavirus might be causative has been dismissed by various studies including those of Bergeron et al. [31] and Bornstein et al. [32].

Diet and oxalate levels

Other authors have reported associations between vulvodynia and high oxalic acid dietary intake. More recent studies have suggested that there is no justification for the evaluation and treatment of hyperoxaluria [33] or modifying dietary habits [34,35].

Inflammation

The erythema found with vestibular pain would suggest an inflammatory aetiology. As described by van Beurden et al. [17], erythema occurs in asymptomatic women. However, Bohm-Starke et al. [36] used LASER Doppler perfusion imaging, and demonstrated increased perfusion in the vestibular mucosa of symptomatic women when compared with controls.

The reports of increased numbers and degranulation of mast cells in vestibular tissue suggested that inflammation was the mechanism for vestibular pain [5,25,37]. This was supported by biochemical findings in a study by Foster and Hasday [38] of biopsy tissue homogenates and the use of sandwich ELISA to find elevated levels of interleukin 1β (IL1β) in addition to tumour necrosis factor α (TNFα), in women with vestibulitis. Somewhat paradoxically, the levels were lowest in biopsies from the areas of highest hyperalgesia. Jeremias and colleagues [39] investigated interleukin 1 receptor antagonist gene polymorphism in women with vestibulitis, and found a higher prevalence of allele 2 homozygosity in patients than controls. This finding was confirmed by Foster et al. [40] who associated it with the carriage of polymorphism of melanocortin-1 receptor gene, and the suggestion of increased risk in women of fair skin.

However, the role of inflammation has been challenged by the group in Stockholm [41] who found low expression of cyclo-oxygenase 2 and inducible nitric oxide synthase in vestibular biopsies of symptomatic women. Our group [42] used immunohistochemical techniques to identify IL1α and β, and TNFα, and found decreased expression of TNFα and IL-1α in biopsies of women with vestibular pain compared with controls. Thus, further research is necessary to define the role of inflammation.

Hormonal contraception

Several epidemiological studies have linked vestibulitis with the early use (before the age of 17) [43], or longer use [44] of the oral contraceptive pill. Bouchard et al. [45] reported a case–control study, where the relative risk of vestibulitis was 6.6 for ever-users of the combined pill against never-users. When the pill was first used before the age of 16 years, the risk increased to 9.3, and the risk increased further with the duration of use ranging from 2–4 years. The relative risk was higher when the pill used was of high progestogenic, high androgenic, and low oestrogen potency. They postulated that the pill might have an effect on the vestibular epithelium (as it does on the endometrium) via sex steroid receptors, making the epithelium more vulnerable to irritants or factors that altered inflammatory response, and caused pain on touch or entry. They suggested a second mechanism might link sex hormones and cytokine production with vestibulitis.

The vignette shown in Table 9.1 illustrates the impact of vulvodynia on the quality-of-life (QoL) and relationship of a young adult who had used oral contraceptives since her late teens.

Table 9.1

	Vignette 1: A routine referral to a special gynaecological clinic: East European Caucasian
Presentation and management	*Mrs SW, 26 years old, married, East European, nullipara, cross-border commuter, worked in London as a secretary* ◆ Mrs SW had been referred to the vulval clinic (VC) by her general practitioner (GP) because of pain in the vulval area ◆ She complained of pain that was only provoked with tampon use and coital entry; pain had been present for four years interfering with her relationship; there was no vaginal discharge or intermenstrual bleeding; periods were regular, monthly with bleeding for three days; she had been on the progesterone-only pill seven years before but side-effects made her change to the combined oral contraceptive (COC) pill, after two years ◆ Prior to this pain, she had enjoyed intercourse and had no difficulties ◆ She had undergone many unsuccessful therapies before being referred for surgery to the VC; her relationship was affected as she abstained from coitus; she had come off the COC pill 5 months previously ◆ She consented to a pelvic examination ◆ Physical examination confirmed a normal vulva on inspection; there was tenderness confined to the posterior vestibule between 3 and 9 o'clock; there was no discharge or bleeding ◆ She emphasised that she had been referred for surgical treatment and would not consider any other method of treatment; she had already had 'many therapies' and was 'fed up'; the operative procedure was explained and she consented ◆ A trial with the application of 5% lignocaine gel on the tender vulval area removed her pain; this allowed her to have intercourse (her husband used sheaths to protect himself from the anaesthetic effects) ◆ She was given an admission date for vestibulectomy under a general anaesthetic (GA); the option to cancel if she changed her mind was mentioned ◆ Mrs SW decided to undergo the surgery and was admitted; she underwent vestibulectomy under GA as planned; vestibular tissue was removed from the paraurethral areas, and the incisions were extended to include the hymen and distally up to the non-iodine staining skin

(*continued*)

Table 9.1 Continued

	Vignette 1: A routine referral to a special gynaecological clinic: East European Caucasian
	◆ She was discharged the next day as scheduled, with advice regarding pain relief, prevention of infection and the use of dilators ◆ Recovery was uncomplicated, and she was satisfied with the results ◆ At the 4 month follow-up VC visit, she was pain free; coitus was no longer painful, and her husband continued to use a sheath for contraception; on examination, the wound had healed well, and the vulva was non-tender with no discharge or bleeding ◆ She was annoyed that she had undergone so many therapies before being referred for surgery; her relationship was improving, and she was discharged
Psychosocial initiating and maintaining factors	◆ Mrs SW did not give details of her past biopsychosocial history to allow for assessment of her personality, and any initiating factors for her vulvodynia; any records in her country of origin were not available ◆ Nevertheless, there appeared to be a psychosomatic element which maintained the pain, prevented intercourse, and made her seek help repeatedly, prior to the VC referral
Impact on the healthcare system	◆ Mrs SW's long history of chronic vulval pain, made her distraught so she opted for surgery, and did not discuss further conservative management ◆ Additional costs for healthcare services were associated with her various unsuccessful treatments prior to the surgery
Implications for training	◆ Recognising the impact of chronic physical symptoms exacerbated by psychosocial factors, and the need to provide more aggressive management if the patient chooses to do so was demonstrated; patient choice is prioritised in psychosomatic training
Was this form of management appropriate and what did it prevent?	◆ The management was appropriate as it made Mrs SW satisfied by obtaining effective pain relief. It also improved her relationship, and prevented psychosomatic distress and a possible break-up in her relationship

Learning points

Patients with persistent vestibulodynia that affect their lifestyles and relationships but do not respond to non-surgical therapies are clinical challenges. In the end, the surgical option after due counselling seems the right option, particularly if the patient has convinced herself that it is the best option, even if told that it is not always successful in bringing about symptomatic relief. At the time, it worked for Mrs SW who was unwilling to accept any other treatment. Conversely, she had also come off the COC pill, which reportedly increases vulnerability to vulval pain [43–48], but this suggestion is controversial; the option to wait and see could not be offered to her. Earlier psychosomatic consultation may have reduced her vulval pain, and prevented years of biopsychosocial morbidity besides her insistence on surgical treatment.

Bohm-Starke et al. [46] demonstrated decreased pain thresholds to von Frey hair filaments in the vestibule of women using oral contraceptives. The same group reported altered pain thresholds over the anterior leg and shoulder [21], and alterations in oestrogen and progesterone receptors in the vestibule [47] of women on the pill. They reported higher expression of oestrogen receptor (ERα) in women with provoked vestibulodynia [48]. Our group [49] found abnormally low or absent oestrogen receptor expression in women with vestibulitis; such contradictory findings are likely to be due to the division of oestrogen receptors into subsets alpha and beta but do not help in understanding whether there is an oestrogen effect.

Further uncertainty about the place of hormonal contraception has followed a recent report by Reed and others [50] of a longitudinal population-based study in Michigan, where Cox regression analysis found no association between vulvodynia and previous oral contraceptive use, including duration of use, and the age when started. Certain women taking oral contraceptives, particularly if the pill significantly reduces menstrual flow, are more prone to develop vulvodynia [45], and should consider alternative contraception.

Neurogenic mechanisms

A recent review by Micheletti et al. [51] described our current understanding of pain mechanisms, with the classification into nociceptive, inflammatory, and pathological types. Pathological pain is described as low threshold pain without protective function (unlike nociceptive and inflammatory types). It is the result of altered nerve processing caused by structural damage to the nervous system; it is neuropathic, and identified by features of neural hyperplasia (the contradictory findings are discussed), or by abnormal function, i.e. dysfunctional pain [51]. The evidence to suggest that provoked vulvodynia may be a dysfunctional pain includes the recognition of other pain syndromes, e.g. headaches, interstitial cystitis, irritable bowel syndrome and fibromyalgia in women with vulvodynia [52,53]. Secondly, diffuse noxious inhibitory control is altered in vulvodynia [21] and thirdly, there is evidence from magnetic resonance imaging. In a study of 14 women with provoked vestibulodynia and 14 controls using voxel based morphometry with T1-weighted magnetic resonance imaging, those with vulvodynia had significantly higher grey matter densities in pain modulatory and stress-related areas, i.e. the parahippocampal gyrus/hippocampus, and the basal ganglia areas of the brain [53]. It is not known whether these changes are the result of pain, or predispose to it, although the authors report that previous studies in older patients with long-standing chronic pain have shown decreases in the grey matter density in similar areas [54].

It is likely that imaging of the pelvis, but also the brain, will enhance our future understanding of vulvodynia and these mechanisms.

Psychological, psychosomatic, and other factors

Many of the patients who attend vulval clinics and are found to have 'vulvodynia' express dismay and frustration at the number of doctors they have seen before a diagnosis is offered, the many treatments attempted without apparent improvement, and an inevitability of 'suffering pain' forever. It is not surprising that they exhibit psychological and psychosomatic features, but it is uncertain as to whether this is the result, or the cause, of their vulvodynia.

To avoid recall bias within retrospective studies, Landry and Bergeron [55] recruited 12–19-year-old adolescent girls from seven high schools in Montreal and found 1439 who were willing to complete questionnaires, which covered sociodemographic, biomedical, behavioural, and psychosocial variables associated with sexual pain. A total of 25% were sexually active (mean age at first intercourse was 14.6 years); 251 had had five or more coital experiences, with 51 admitting to associated pain for at least six months, and 167 were pain free. Those with pain were likely to have experienced pain with first tampon use, and usually thereafter. Those with pain were almost twice as likely to report sexual abuse, to fear physical abuse, and show the anxiety trait. These results may only be relevant for primary vestibulodynia, but demonstrate the value of a psychosomatic approach.

Women with vulvodynia are found to have worse levels of mental health-related QoL. Schmidt et al. [56] examined 53 women with vulval dermatoses and vulval pain using QoL, psychological profiles and general health rating scales, including the Skindex questionnaire, Brief Symptom

Inventory, and a General Severity Index. On average, patients with dysaesthetic vulvodynia had higher scores on all QoL scales than patients with vestibulitis and dermatoses. The authors commented that chronic pain in an intimate female organ is likely to affect a broad range of emotional functional dimensions of life. Patients with vestibulitis displayed a specific pattern of psychological symptomatology. Sargeant and O'Callaghan [57] sent questionnaires to 51 women with vulval pain and to 46 without. They reported significantly worse levels of mental health-related QoL among the women with pain. Wylie et al. [58] reported that levels of psychological distress were significantly higher within the domains of somatization, obsessive-compulsive, anxiety and phobic symptoms, interpersonal sensitivity, hostility, and paranoia among 82 British women with vulvodynia, compared with 82 British women in a control group with general dermatological conditions. Masheb et al. [59] assessed 53 women with vulvodynia and found nine (17%) with current major depressive disorders (MDD), and 24 (45%) with lifetime prevalence. Women with current major depressive disorders reported greater pain severity, and worse functioning and QoL. Among women with lifetime depressive disorders, the majority had their first episode before the onset of vulvodynia. Rates of current depression seemed lower than rates of depression in other women with chronic pain.

Saunders et al. [60] compared women with vulvodynia and those with yeast infection, and found higher McGill pain scores among those with vulvodynia. However, when women with vulvodynia were compared with those with pelvic pain or headaches, those with vulval pain had lower total scores on the McGill Pain Questionnaire, as well as affective, sensory, cognitive, and miscellaneous indices. Furthermore, they chose fewer words to describe their symptoms from the 20-word list [61]. Women with vulvodynia showed changes in sexuality and sexual activity, reduced arousal potential and interest in intercourse, and were highly likely to refuse a partner's sexual advances [62,63]. While acknowledging the findings in the Montreal adolescent study about a history of abuse, other studies found no evidence to support a role for previous sexual or physical abuse [64–66].

When women with primary provoked vestibulodynia (i.e. have had pain from first attempts at tampon use or intercourse) were compared with those with secondary provoked vestibulodynia, the former group reported lower levels of social and emotional functioning, heightened anxiety with body exposure during sexual activity, in addition to lower pain, and heat detection thresholds at the vestibule, and over the forearm [67].

Evidence that women with vestibulitis or vestibulodynia show impaired sexual functioning, with lower levels of sexual desire, arousal, and frequency of intercourse has been reviewed by a group from Montreal [68]. Paradoxically, a group from the same city, after studying patients with vestibulitis and control women, showed that there was a significant increase in physiological sexual arousal and vulval sensitivity when shown an erotic film. Women with vestibulitis reported a lower desire to participate in penetrative intercourse after viewing the film, and reported lower levels of desire and arousal when assessed using a questionnaire. These women had more genital and non-genital pain sensitivity, and more catastrophizing, hypervigilance and fear of pain [69]. Others have also found no evidence of primary sexual disturbance among women with vestibulitis, but that they exhibit many different somatic symptoms indicating a psychosomatic association with their illness [70].

Lynch [71] proposed that vulvodynia is essentially a somatoform disorder, which develops as a result of pre-existing psychosexual dysfunction due to a variety of precipitating factors. There appears to be limited literature on this theme. Jantos and White et al. [72] studied medical, psychosexual, personality, and relationship parameters, alongside behaviour, and psychopathology in 50 women with vestibulitis. Although the patients satisfied a number of criteria for somatization disorder, there was insufficient evidence for such a diagnosis. Bodden-Heidrich et al. [73]

examined 67 women with vulvodynia, and 97 with chronic pelvic pain syndrome, and showed significantly higher somatization among the pelvic pain patients. They concluded that the two groups of patients belonged to two distinct psychosomatic gynaecological syndromes. In contrast to the pelvic pain patients, the patients with vulvodynia appeared to have psychological problems as a result of their symptoms, rather than as the cause.

The vignettes shown in Table 9.2 illustrate the intricate factors involved in managing patients who present with vaginal pain.

Table 9.2 Vignettes 2 and 3 depict the complexities in diagnosing and treating patients with vulvovaginal pain.

	Vignette 2: A routine referral to a special gynaecological clinic: British Caucasian	**Vignette 3: A routine referral to a special gynaecological clinic: a Caucasian migrant**
Presentation and management	*Mrs IM, 32 years old, married, housewife, para 2 who had normal deliveries after term normal pregnancies* ◆ Mrs IM was referred to the VC by her GP because of vulval symptoms as repeated visits to his clinic, and Sexual Health Clinics had brought no symptom relief ◆ At the VC, Mrs IM complained of rawness and soreness in the vulval region; these symptoms were exacerbated by coitus although manifest at other times, e.g. while working or sitting in the car; she never had pruritus, discharge, or vulval bleeding ◆ She recalled that her symptoms had started prior to her first pregnancy ◆ She was vague about the onset of her symptoms ◆ She was not bothered by her monthly, occasionally painful, menstrual periods, other than having to use a pad and not a tampon; she never had post-coital bleeding or vaginal discharge; her cervical smears were normal ◆ Multiple tests by the GP and Sexual Health Clinics failed to find 'thrush'; consultations were discouraging; a pelvic scan showed a normal uterus with adnexae ◆ She consented to an examination, and any investigations, including biopsies	*Mrs BK, 38 years old, married, nullipara, left her country of origin in Western Europe, to seek work in a hotel* ◆ Mrs BK was a gynaecological referral to the VC because her cervical smears had shown moderate–severe dyskaryosis ◆ She complained of vulval itching with no accompanying discharge or bleeding ◆ Her periods were regular with monthly bleeds ◆ Her past medical records were unobtainable ◆ After obtaining her consent, she was examined under colposcopy; on applying toluidine blue, acetowhite areas were defined ◆ Mapping biopsies under GA were undertaken ◆ The reports indicated a high-grade intraepithelial neoplasia ◆ Mrs BK was brought in for laser ablation of labial skin and mucosa with preservation of the introital architecture ◆ At her follow-up appointment she complained of long periods of vulval soreness; she also mentioned that she had been unable to contemplate intercourse and rejected her husband's attempts to do so ◆ On examination, her vulva appeared normal with a typical transformation zone; a cervical smear was taken ◆ Her cervical smear report was mailed to her as it was negative so no further action was required ◆ Six months later at follow-up her examination findings remained normal

(*continued*)

Table 9.2 Continued

	Vignette 2: A routine referral to a special gynaecological clinic: British Caucasian	Vignette 3: A routine referral to a special gynaecological clinic: a Caucasian migrant
	◆ On examination, she had a normal vulva, other than a slightly tender area of vestibular erythema ◆ Routine swabs to rule out infection were taken followed by a vestibular biopsy under local lignocaine (2%) anaesthetic using a 4 mm Keyes punch biopsy technique; advice to help with healing, and pain relief was given ◆ She was started on a reducing course of Trimovate (clobetasone, nystatin and tetracycline) and a follow-up appointment given ◆ She was reviewed after 2 months ◆ On examination, her vulval biopsy had healed; further explanation about her biopsy report stating a 'mild, lymphocytic dermal infiltration' that had been mailed her, was given ◆ She mentioned that there was no symptomatic improvement, other than when she had been admitted for varicose vein stripping two weeks before, and returned home symptom-free ◆ She chose to continue with her treatment and to be reviewed after three months ◆ At her third visit to the VC she enquired whether all infections had been excluded; as samples for serology for syphilis or human immunodeficiency virus had not been taken, she requested these ◆ On examination she was reassured of the normalcy of her vulva ◆ When seated following her examination, she started crying as though frustrated; she then began talking, in considerable detail, about her first and unwelcome sexual experience, and incest; the guilt associated with anything involving her vulva; her desire to 'unburden herself' without having to tell her GP	◆ She was greatly concerned about what she perceived the treatment of her abnormal cervical smear had done to her vulva ◆ She complained that she had vulval pain, and a burning sensation that was almost continuous; these symptoms were interfering with her employment, and putting a strain on her marriage ◆ She also complained of dysuria but a culture of a urine specimen showed no pathogenic growth that required to be treated ◆ Referral to a psychosexual doctor was greeted with cynicism but after further discussion she accepted to attend this specialist's clinic ◆ At the first consultation with this doctor, she was very defensive and reacted in a somewhat distant manner presuming that the doctor would be a forbidding personality ◆ Fortunately she returned for more sessions; she was always unaccompanied; her husband's response to the effects of her therapy were not available despite repeatedly being asked by health personnel to accompany Mrs BK when she attended the clinic ◆ Nevertheless, she was able to discuss her anger at becoming infected with HPV, and the need to have undergone "such embarrassing" treatment ◆ When she finally returned to the VC, she was able to talk more freely about her concerns and accepted the offer of regular follow-up assessments ◆ Gradually her vulval symptoms subsided ◆ She was able to re-establish coital activity with her husband without experiencing vulval pain ◆ She was happy to be discharged from the VC to her GP's follow-up care ◆ A plan to attend for regular cervical smears was given to her ◆ If her condition changed in the future she could be urgently referred back for specialist care at the local hospital, and given appropriate advice for any new vulvovaginal symptoms

Table 9.2 Continued

	Vignette 2: A routine referral to a special gynaecological clinic: British Caucasian	Vignette 3: A routine referral to a special gynaecological clinic: a Caucasian migrant
	◆ She accepted referral to a female psychiatrist; after several sessions of psychotherapy, Mrs IM changed her view about her body; she was no longer ashamed of it; her vulval symptoms subsided ◆ She returned for a 'final check' to the VC; her symptoms had resolved; she was reassured about her normal vulva ◆ She was discharged from the VC	
Psychosocial initiating and maintaining factors	◆ Mrs IM had experienced sexual assault, and incest in her teens ◆ This created anxiety and fear related to touching her vulva ◆ She was unable to discuss about her fright with anyone ◆ The initiating factor for her vulval pain was her sexual experience as a teenager ◆ Although she had delivered vaginally, she found coitus reprehensible; psychosomatic repercussions maintained the vulval pain so she rejected her husband's sexual advances	◆ Mrs BK fitted the profile of an economic migrant; inability to get records of her medical history stalled her psychosomatic assessment ◆ She had been dissatisfied with her management initially despite being given explanations ◆ She grumbled incessantly ◆ Her responses and her inability to have intercourse seemed suggestive of a latent psychosomatic disorder but she was reticent about her relationship, and her husband's viewpoint was not volunteered
Impact on the healthcare system	◆ Mrs IM's long history of pain initiated help-seeking behaviour ◆ The repeat appointments and investigations/treatments for her complaints would have incurred costs on the healthcare system ◆ She had been reticent earlier on but after attending the VC, confided; the attending clinician with psychosomatic awareness helped plan her further management towards a cure	◆ Her pattern of hospital admissions suggested that she would be using healthcare facilities repeatedly ◆ She did not express dissatisfaction with the status of her current relationship but the support from her husband seemed uncertain ◆ Mrs BK obtained effective pain relief and was cured after multidisciplinary health care, this had additional costs
Implications for training	◆ History-taking by gaining the patient's confidence facilitates effective healthcare provision; psychosomatic training highlights this cost-effective aspect, and prevents pointless clinic visits	◆ Her complaints led to appropriate management, yet Mrs BK was dissatisfied; the counselling led her to gain insight into her problems, and facilitated her recovery; this typified psychosomatic training

(*continued*)

Table 9.2 Continued

	Vignette 2: A routine referral to a special gynaecological clinic: British Caucasian	Vignette 3: A routine referral to a special gynaecological clinic: a Caucasian migrant
Was this form of management appropriate and what did it prevent?	◆ The management was apt. It enabled Mrs IM to confide in the specialist at the VC who provided effective care. Gaining insight into her problems, prevented further dissatisfaction, and avoided needless surgery with possible psychosomatic sequelae	◆ This form of management was appropriate, as it prevented unnecessary usage of healthcare resources. It also reduced Mrs BK's dissatisfaction from the necessary laser cervical treatment after the reporting of dyskaryotic cervical cells in her cytology report

Learning points

Patients with vestibulodynia, which affects their lifestyles become less responsive to management if there are repeat failures in providing symptom relief. This has been depicted in Mrs VC's case, who had repeated unsatisfactory consultations prior to getting effective psychosomatic healthcare. Mrs BK was dissatisfied after the necessary treatment for an abnormal cervical smear and acquired vulval pain that affected her relationship; she was persuaded to accept psychosexual counselling early, and was cured. Referral to a clinic providing psychosomatic specialism can aid the patient in receiving the necessary multidisciplinary care, thereby preventing dissatisfaction and biopsychosocial morbidity that could lead to a quest for more invasive management for pain-relief (see vignette 1, Table 9.1). The inability to obtain a detailed biopsychosocial history (see Chapter 2) can limit effective treatment for an earlier resolution of symptoms of vulval pain.

Management

Current recommendations for the treatment of vulval pain include general advice, e.g. discouraging the use of potential irritants or allergens including soap, sprays, lotions and douches; rinsing the skin with water after micturition; use of cotton underwear, and cotton menstrual pads and tampons. Avoidance of soap powders with biological enzymes, applying hair removal creams, and tight Lycra gym gear may also help.

Treatments for generalised and unprovoked pain include prescribing antidepressants such as amitriptyline, and anticonvulsants such as gabapentin and pregabalin [74–77]. Despite antidepressants being effective in select cases, the basis for their use remains tentative, and further research is warranted [75]. Among the anticonvulsants, gabapentin is preferred by some specialists because of the relative freedom from side-effects; also, the cost of the drug regime is less when compared with the regime with pregabalin, but the latter may be preferred due to better clinical efficacy. An example of a regime for such treatment may start with 300 mg of gabapentin per day, gradually increasing to 2700 mg/day. Patients may be susceptible to the side-effects that can be manifest as loss of proprioception and unsteadiness of gait. This would then require dose manipulation to suit the patient, starting from a smaller dose with gradual increments. Once modification of the pain is achieved, the medication is continued for 2–3 months and then gradually reduced again until it is stopped. Continuing at a lowered dose to help with the symptoms may have to be considered. However, evidence supporting the use of systemic gabapentin is insufficient, thus this requires further appraisal [78].

Treatments for localised and provoked pain include topical applications of antifungals, antibacterials, corticosteroids, oestrogens, local anaesthetics, gabapentin, nifedipine, and nitroglycerine [79–81]. Improvement has been reported with the use of Montelukast, a leukotriene receptor antagonist, which is also being used to treat asthma [82].

Foster et al. [83] have reported from their randomised controlled trial of 133 carefully defined vulvodynia-afflicted women, who were managed with lidocaine cream plus desipramine (a tricyclic antidepressant similar to amitriptyline) tablets; lidocaine plus placebo tablets; placebo cream and desipramine tablets; or both placebo cream and tablets; all treatment arms reported substantial improvement, with reduction of tampon-test pain. They found a 36% reduction with lidocaine cream plus desipramine tablets; 20% with lidocaine cream plus placebo tablets; 24% with placebo cream plus desipramine tablets; but also a 33% reduction with placebo cream plus placebo tablets. Their findings reinforce the powerful effect of managing patients in a trial setting, and with highly organised recruitment and supervision. Their next planned study is to compare placebo with extended release gabapentin [84].

Pelvic floor muscle activity helps with biofeedback, physiotherapy, and botulinum toxin [85–87], and can help in reducing vulval pain. Bachman et al. [88] reported on a sample of 24 patients. They used a multidisciplinary approach with desensitization of the vestibular mucosa, rehabilitation of the pelvic floor muscle function (supervised by a midwife), and psychosexual adjustments (with a counsellor); 19 (79%) of the group were cured or considerably improved.

Vestibulectomy, with various modifications [89,90] has produced high success rates for some [91–94] and low rates for others. Bohm-Starke and Rylander reported 56% complete, or major improvement in women with secondary vestibulodynia but only 17% for those with primary vestibulodynia [95]. Appropriate case selection and counselling when taking a consent is obligatory, as the results after surgery may not be considered as satisfactory by many who sought the operation.

Other treatments include acupuncture, cognitive behavioural therapy, and psychosexual counselling plus various combinations of these [96,97]. The construction of a biopsychosocial model for vulvodynia, and sexual dysfunctions [98] can help with the management. Nonetheless, many women experience reduction in pain over time, regardless of treatment [99]. Management strategies [100] need to be evaluated further.

Vulvodynia remains a major cause of patient referrals [101]. Increasingly, management requires a multidisciplinary approach, with a lead clinician triaging patients towards where greatest expertise is available [24]. Algorithms have been provided to guide referrals for secondary care and appropriate management [102–104]. A study of clinical cases [105] indicates the need for further awareness of the psychosomatic aspects of vulval pain, which requires individualised management. It can be puzzling to the unfamiliar [106] who are in training or in clinical practise (see Case studies 1–3), more so if they encounter a patient who has faced repeated disappointments with clinical outcomes, and expresses her frustration through reticence.

Conclusions

New terminology has attempted to reduce confusion with the classification of vulval pain disorders but will continue to evolve as understanding improves. While the most recent classification of vulval pain disorders appears comprehensive, application to clinical practice could sometimes be problematical. Among the limitations to its application in guiding practice are clinical presentations where a specific vulval disorder and vulvodynia occur concurrently, or where the original clinical picture, and the patient's response to it, have been altered by the effects of repeated treatment failures. In all circumstances where the patient can be extremely disappointed with the

management outcome, a psychosomatic approach could advance progression towards effective cure; this is exemplified in the case studies that add to the theoretical discussions here.

For some clinicians who are unfamiliar with this painful condition, which variously affects patients from diverse biopsychosocial backgrounds, training in relevant patient-centred care would be a useful exercise. While a good history can often facilitate appropriate diagnosis, the diversity of the condition can hamper appropriate treatments that lead to satisfactory outcomes. Effective management can also be hindered by the patient's reluctance to disclose relevant personal/treatment details that are not documented in previous medical records, as illustrated in the three clinical vignettes. Hence, training that encourages a better understanding of the significant facets in the patient's personality and background that have a bearing on the initiation, and that continue to sustain her illness-behaviour, is necessary in order to facilitate cure of these patients. We remain relatively ignorant of the cause(s) of vulval pain, and thus treatment groups are heterogeneous.

In reviewing management successes, it is important to remember the large response to placebo, and the realization that many women will find that the severity of the pain perceived reduces progressively with the passage of time, irrespective of the treatment. Moreover, as the vignettes represent varied clinical situations, adaptations to each scenario could lead towards effective symptom management. Notwithstanding, a gradual spontaneous resolution of symptoms over the years in some patients may call for less aggressive management, where possible, after discussing with the woman/couple. The lack of involvement of the partner could be a barrier to effective management outcomes, and relationship issues may need to be addressed early in some couples.

Further research to better understand the disease, and tailor its management is indicated.

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Chapter 10

Psycho-oncology and psychosocial aspects of gynaecological cancer

Hideki Onishi and Mayumi Ishida

Introduction

Patients with gynaecological cancer daily encounter various problems in their lives, which are related to their family, their occupation, and finances, in addition to the biological effects directly caused by the presence of the cancer itself. They also face problems concerning a loss of femininity, such as problems associated with an earlier menopause, their reproductive function, and sexual activity [1]. Patients, with gynaecological cancer therefore, not only suffer from the biological consequences of the cancer, but also from relevant psychosocial problems that can add to an increase in their stress levels.

Psycho-oncology refers to both the clinical and academic fields [2] that investigate the mental influence of cancer and its treatment. Psycho-oncology is a relatively new academic field, which originated and developed in the USA in the 1960s, to deal with pertinent biopsychosocial issues that arose when patients were first informed of the diagnosis of cancer. It needs wider recognition to enhance the care of patients suffering from cancer.

In this chapter, the complex patient and carer needs, generated by psychosomatic interactions in patients with gynaecological cancer, are discussed along with the measures that have been introduced to cope with the emergent problems.

Biopsychosocial problems with gynaecological cancer

The prognosis of gynaecological cancers is not favourable when compared with other advanced cancers, despite the advances in relevant therapy [3]. Progressive morbidity and eventual fatalities are associated with the uncontrolled growth of many gynaecological cancers. Various aspects of daily living, such as employment and family life, are affected by the disease and its therapy. Participating in the medical consultation for selecting the most appropriate therapeutic method/s for treating the cancer, and undergoing the planned surgery, chemotherapy and/or radiotherapy, is stressful for patients.

In those having an occupation, temporary retirement due to hospital admissions and treatment, besides commuting to hospital for outpatient management/follow-up, and the loss of physical strength due to the disease and its management, may all lead to changes in their occupational status and affect all related tasks. A transfer to an undesirable position at their place of work, and redundancy because of the cancer-related management, can result in the loss of their social roles, which in turn can lower their self-esteem. Moreover, a change of role within the family, due to the limitations imposed by the cancer and its treatment, can lead to a reduction in the patient's self-worth and alter her relationship with her husband/partner [1]. These may serve as stressors and

could progress to psychiatric problems in a patient who has been diagnosed with a gynaecological malignancy. It has been pointed out, that by paying attention to psychosocial difficulties, rather than dwelling only on physical problems, one can significantly improve the quality-of-life (QoL) of these patients [4]. Therefore, providing the means for individualised biopsychosocial support is an essential part of the comprehensive management of patients suffering from the psychosomatic ill-effects of gynaecological malignancies.

Sexual problems can also be an important concern in the management of patients with gynaecological cancer (see Chapter 11).

Outline of normal psychological responses and psychiatric diseases in cancer patients

General reactions to receiving a diagnosis of cancer

General reactions to 'bad news' such as receiving a diagnosis of cancer, recurrence of the cancer, and the discontinuation of curative treatment, are divided into three stages [5]:

1. The first stage is the 'shocked phase': The 'bad news' is received, patients are stunned, they cannot recall or believe anything, and may not remember the explanation given regarding the cancer, which they have developed. This phase continues for about a week.
2. The second stage is the 'anxious/depressive phase': Anxiety and depression are manifest due to the 'sinking in' of the information provided regarding the cancer, and an uncertainty over the future. Concomitant insomnia and anorexia may also occur in these patients.
3. The third stage is the 'adjustment phase': Patients reach this stage after about two weeks from the first consultation regarding the cancer. They accept their situation and are able to become more realistic about the treatment offered. A willingness to go along with further management is expressed.

Naturally, this whole process varies markedly among individuals, depending on their personalities before developing the cancer, and other background social/environmental factors that could affect their coping skills.

Reported psychiatric disorders in sufferers of cancer

To investigate psychiatric problems in cancer patients, various surveys of the prevalence of psychiatric disorders have been performed. In 1983, Derogatis et al., consecutively interviewed 215 patients with cancer at three hospitals in the USA, and made psychiatric diagnoses in 47% of the sample; adjustment disorder and depression were diagnosed in 64% and 13%, respectively [6]. In another survey of cancer patients undergoing treatment, Grassi et al. reported that the prevalence of adjustment disorder and depression was high regardless of the cancer type; dysphoria (anxiety/depression) was noted in 20–40% of patients throughout all stages of the disease, and this persisted irrespective of any cultural differences [7]. In a later report [8] where patients undergoing palliative therapy were assessed at registration (baseline) and at hospitalisation, adjustment disorder (16%), and depression (6%) at registration were predictive of adjustment disorder (11%) and depression (12%) at admission, although there was an attrition to one-third of the original sample size between the two time points. Only the Hospital Anxiety and Depression Scale suggesting dysphoric symptoms was predictive of future adjustment disorder or depression.

While surveying patients who were in advanced or terminal stages of their cancer, Minagawa et al. carried out structured interviews in 93 who were at the terminal stage. Various psychiatric disorders were present in 53.7% of these patients, and 42% were diagnosed with cognitive

impairment [9]. Among these, delirium was observed in 28%, dementia in 10.7%, adjustment disorders in 7.5%, amnestic disorder and major depression in 3.2%, and generalised anxiety disorder in 1.1%. The incidence of delirium rose as the cancer progressed nearer to the terminal stage [10]. Among the pathologies associated with delirium were hepatic failure, prerenal azotaemia, hyperosmolality, hypoxia, disseminated intravascular coagulation, central nervous system damage, infection, and hypercalcemia. Delirium can be one of the side-effects of the medication being administered to these patients.

Psychiatric problems specific to gynaecological cancer

The prevalence of psychiatric disorders in patients with various cancers, including gynaecological cancers, has been clarified in later surveys. Although the methodology, participants' characteristics, and sample size have varied among surveys, the incidences of adjustment disorder or depression were as high [11–14] as those reported for other types of cancer [15]. Moreover, a depressive state was noted in up to 40% of patients with gynaecological cancers. The prevalence of symptoms of depression, and related social problems were reportedly higher in patients with gynaecological cancer than in those without such cancer [13]. Moreover, patients had a significantly higher risk of depression/anxiety if they had metastases or previous episodes of depression/anxiety [14], and were >50 years of age, whereas those with private health insurance had a lower risk of depression, and anxiety. The persistence of psychiatric symptoms in patients who had poor social support was also noted [15,16]. Patients with severe psychological distress complained more frequently of significant physical symptoms [17]. In a survey of 143 patients with ovarian cancer (stage III or IV), 20% had moderate to severe psychological distress, and the level of stress related to the disease and its treatment was high in more than half of these patients. Nevertheless, 60% of the total with psychological distress did not use mental health services or take psychotropic medication [18].

In a survey of 199 disease-free gynaecological cancer survivors many years after completion of treatment, 29% showed clinical-level anxiety, 24% feared recurrence, and 19% developed symptoms suggestive of post-traumatic stress disorder (PTSD), which rose to 29% in those with advanced disease [19]. In another study [20], 57% of patients with gynaecological cancer sought support for emotional problems, and 73% wished that they had been asked about emotional problems by their physicians. Emotional problems expressed by many included feeling nervous (40%), worrying (34%), fear (25%), sadness (21%), and loss of personal control (17%). They (59%) also felt that physicians should ask about whether they needed any help to discuss relevant spiritual matters. Also, 61% wanted physicians to ask them whether they needed help to broach difficult topics with their families, such as the possibility of dying, or discussions about living wills, and other psychosocial concerns related to their cancer.

Social problems

The development of cancer can lead to social problems, such as those related to redundancy, demotion, unwanted changes in tasks, changes in the relationship with supervisors, and colleagues at their workplace, in addition to an inability to cope with occupational commitments due to a loss of physical stamina [21]. In addition, this sample of women felt that there was a need for discussion with health professionals about the impact of the cancer on their jobs, and any problematic issues after they had resumed employment.

Regarding working conditions after the development of cancer, about half of the patients inevitably lost their jobs or experienced a change in working conditions. The changes related to their jobs were associated with an advancing age, while undergoing the complex treatments for the cancer, more than one comorbid health condition, undertaking chemo/radiotherapy, and having

to undergo further treatments for other specific symptoms linked to the progression of their particular type of cancer [22]. Although work-related changes led to lower physical functioning, patients also reported positive social functioning after resuming work, which suggested a need for organisers of rehabilitation programmes to consider these issues when promoting a return to work after cancer treatment.

In a quality-of-life (QoL) survey, the QoL of patients with gynaecological cancer improved six months after starting therapy, but the improvement remained at a similar level for two years thereafter. The level of the response to treatment was a predictor of the later QoL [23]. In another survey of the QoL of patients with gynaecological cancer (n = 85), who were under follow-up at a median time of 39 months since completion of treatment, no overall difference was observed in how they rated their emotional health when compared with controls (n = 45). Positive emotional health was high in those who had survived following treatment for gynaecological cancer but long-term treatment reduced physical well-being. Moreover, significantly lower QoL was associated with those who had ovarian cancer, if they had received radiation or multimodal therapy, or if they had less than high-school education, and if they were receiving less help at home [24]. Accordingly, such patients would need additional support.

In patients with advanced recurrent ovarian cancer who were receiving palliative therapy, having hope, having days when they felt happy, and developing a strong social support system, enhanced their QoL, whereas fear of the disease (90%) and worrying about family and friends (100%), reduced their QoL. These patients felt that psychosocial issues had a greater impact on their QoL than physical issues [4].

Furthermore, the QoL was reduced in patients with advanced cancer compared with those who were disease-free. A low QoL in those with advanced disease, and a predicted survival of ≤5 years, has been reported [25]. In a more recent publication [26] there was no significant difference in the health-related quality-of-life (HRQoL) between short-term (<5 years since diagnosis, YSD) and long-term (5–10 YSD), or very long–term (>10 YSD) cancer survivors other than for fatigue and appetite-loss, which had a higher prevalence rate in short-term survivors. Nonetheless, when compared with controls, the majority of the HRQoL scales were poorer in the short-term survivors, whereas a significantly reduced global QoL, physical function, social function, and fatigue, were observed in long-term survivors.

Why is mental healthcare necessary during cancer therapy?

Previous studies have clarified that psychiatric symptoms have negative influences, not only on day-to-day activities of patients with cancer but also on their treatment outcomes. The negative influences of psychiatric symptoms on cancer therapy are discussed next.

Distress of mental disorders

Anxiety and a depressive state cause not only mood-related symptoms but also lead to anguish [27], so clinicians and carers looking after patients suffering from cancer should also appraise their psychosocial and spiritual health needs [28]. Delirium is also a distressful experience for patients [29]. This was observed in a systematic examination of a sample where delirium was rated using the Memorial Delirium Assessment Scale to measure its severity, phenomenology, and resolution.

Reduction in quality-of-life

The QoL of cancer patients decreases when a depressive state, psychological distress, and maladjustment to the management of cancer are present [22]. The QoL of patients in a depressive

state is reduced by its effect on aspects of social, emotional, cognitive, and physical functioning [30]. In a study [31], which investigated the QoL and sleep disturbances along with manifestations of depression and anxiety in patients with ovarian cancer, assessments were carried out before surgery for the pelvic mass, and then at six months and one year after surgery. In the majority, global sleep disturbances occurred at all three time points along with depression, and affected their QoL with no relief from the pharmacological treatments provided; a need for screening for sleep disturbances, and an appropriate management strategy was advocated. Recently, a report on the assessment of HRQoL following radiotherapy for gynaecological malignancies indicated that patient-reported HRQoL worsened during radiotherapy but improved subsequently [32]. Additionally, a need to evaluate the potential beneficial effects of clinically-recommended psychosocial interventions during radiotherapy was advocated.

Impaired decision-making

Decisions made by the patient regarding their therapy are also influenced by their mental health. For example, when breast cancer patients were compared using a control group who were not depressed, with a group who were depressed, 92% of patients in the control group underwent postoperative chemotherapy for breast cancer, but only half of those in the depressed group did so ($P<0.001$) [33]. The authors concluded that the treatment of depression would enhance patient acceptance of adjuvant treatments along with chemotherapy.

Suicide

The suicide rate is about twofold higher in cancer patients than in the general population, and risk factors are physical pain, despair, a poor prognosis, and a depressive mental state [34–36]. There is a higher rate (30% greater risk) of suicide in women with gynaecological cancer when compared with those with other malignancies [37], particularly during the first four years of receiving their diagnoses. In another survey regarding the suicide rate among patients with cancer [35], 80% were in a depressive state, and this was similar to the frequency (82%) of non-cancer suicides in this Finnish sample studied. The majority of cancer suicides were carried out by those who had concurrent mental disorders. Again, suicide was reportedly more common [36] at a younger age and within the first year of receiving their diagnosis, and more likely in those with ovarian cancer or those with high-grade disease, and in those who did not have surgical intervention.

Suicide ideation is also high in patients with gynaecological malignancies, in particular among those with ovarian cancer [38]. Coping strategies to deal with the associated acceptance/resignation, depression, chemotherapy, and further improvement in care provision could prevent suicide ideation. The families of cancer patients can also have severe mental distress [39].

Measures to treat the psychosocial problems of cancer patients

Patients with cancer can have serious psychosocial problems, and the psychological distress of patients can be reduced by timely and appropriate intervention. In order to reduce cancer-related distress, biopsychosocial problems associated with cancer are approached in an interdisciplinary fashion, with various fields, such as medicine, psychology, sociology, thanatology, and philosophy, being addressed as required, to help reduce any of the contributing problems that can affect patients contemporaneously.

Psycho-oncological treatment of cancer patients

The need for and efficacy of psychiatric treatment

Psychiatric symptoms distress patients and their families, and negatively influence cancer therapy. However, these symptoms can be minimised by a combination of appropriate psychotherapy and drug therapy [40]. Psychiatric intervention reduces distress, and improves the QoL of patients which in turn can help them make appropriate decisions regarding their preferred choice of cancer treatments. Subsequently, this reduces some of the burden on family members, who continue to provide supportive care to cancer sufferers worldwide.

End-point of cancer therapy

When curative medical care focuses only on the physical aspect of disease manifestations, even though it aims to cure by preventing further progression of the ailment, with specialised treatments of the affected organs that has markedly advanced, it often does not meet the overall expectations of the patient, particularly when the illness affects both the physical and the psychosocial aspects. Hence, the impact on treatment outcomes using a 'reductionistic' approach applied only to the management of the physical manifestations remains limited for all patients who are suffering from the biopsychosocial effects of cancer.

In 1977, George Engel [41] proposed a biopsychosocial model to address not only the physical condition but also the psychosocial aspects of disease in all patients who were receiving medical care. This is also the end-point of effective cancer treatment. Accordingly, when planning suitable interventions at the start of cancer treatment, the physical condition of the patient should be assessed, and problems requiring attention should be identified, any concurrent psychiatric problem should be evaluated, and liaison with physicians specialised in the relevant fields should be carried out. After carrying out the initial psychosocial evaluation of patients, and addressing any emergent problems, an improvement of the QoL by such collaborative interventions is to be expected. The creation of an effective support system to match each patient's particular biopsychosocial needs along with attention to their specific requests regarding informed treatment choices will also contribute to an improvement in their QoL [5]. Consequently, developing an optimal support system tailored to each patient is important.

Mental disorders frequently noted in cancer patients

Adjustment disorder

Adjustment disorder is a stress-reactive disease and refers to those conditions that manifest as symptoms of intense psychological stress, which induce anxiety and a depressive state of greater severity than might be expected. Consequently this leads to a disruption of day-to-day activities. It can present as insomnia, reduced work efficiency, a lack of desire to perform housework, and other behavioural changes such as suddenly bursting into tears.

Incidence

In a survey of hospitalised cancer patients, of the 47% who suffered from psychiatric conditions, 54% had adjustment disorder [6]. In another survey of terminal-stage cancer patients, in whom 53% had psychiatric conditions, adjustment disorder was present in 13% [9].

Cause

Adjustment disorder occurs due to a change in the response to certain psychological stresses. During the treatment of cancer, the disorder can occur when the patient is informed about the

diagnosis of cancer or when it recurs after a probable cure. It can manifest as a response to changes in the course of treatment, or if there are changes in the patient's family relationships, her job, or her finances [42].

Diagnosis

Elements assumed to be stressors appear during the treatment of cancer, and anxiety and a depressive state occurs in response to these. However, these states do not fulfill the diagnostic criteria of major depressive disorders. When the condition is more severe than expected for the stressors, and disrupts one's daily living activities and work, a diagnosis of adjustment disorder is confirmed.

Differential diagnosis

Although the symptoms of anxiety and a depressive state may be similar to those of depression, adjustment disorder can be differentiated from depression by excluding the other symptoms of depression. Thus, adjustment disorder will not meet the diagnostic criteria for depression are not met other than feeling low. The depressive symptoms are also mild in comparison. Notwithstanding, there may be difficulties in differentiating between depression and adjustment disorder, particularly by those medical personnel who have limited clinical experience of this health condition.

Treatment

No specific treatment is available for adjustment disorder, and general psychotherapy is employed. A moderate therapeutic benefit of psychotherapy on anxiety, and the depressive state in cancer patients has been reported in a meta-analysis [43], which demonstrates the usefulness of this form of management.

The most common treatment for adjustment disorder is supportive psychotherapy, which centres on listening, sympathy, support, affirmation, acceptance, and reassurance. The development of the cancer causes a feeling of loss, and brings about life and role changes, anxiety about the future, and fear. During treatment, therapists listen to patients intently, empathise, support, and confirm without criticising, while giving realistic assurances. Since the levels of anxiety and the depressive state vary among individuals, treatment is highly individualised. When the efforts of therapists to understand and support patients are transmitted over to the patients, these actions become therapeutic, and may improve the depressive state and anxiety, in addition to facilitating self-insight. Thus, it is essential for therapists to maintain an attitude that facilitates effective communication. Crisis intervention, as well as cognitive-behaviour, and problem-based therapies may be combined.

Drugs should be prescribed where indicated by the clinical picture, such as when the patient presents with insomnia and anxiety, but they should be usually given in conjunction with psychotherapy.

Depression

Depression represents a pathology associated with: (1) a depressive mood and reduced interest/avolition, as the main symptoms; (2) other psychiatric symptoms; and (3) somatic symptoms [44]. It is essential that somatic symptoms are included among the symptoms of depression, in addition to emotional symptoms.

In the presence of depression, distress caused by mood symptoms may negatively influence cancer management. Hence, early identification and appropriate therapeutic interventions are necessary.

Incidence

In surveys of cancer patients, the prevalence of depression was 7% in those with recurrent breast cancer; 5% in those with non-resectable lung cancer; 6% in patients undergoing treatment for cancer; 4.7–8% after the resection of lung cancer, and 12% in patients who were in the terminal stage of cancer [6,9,15].

Depression is not rare in cancer patients, and the incidence is reportedly higher than that in the general population [45]. In a study investigating predictors of depression, a depressive state during early treatment, lack of social support, and persisting pain were associated with the prediction of depression [15].

Diagnosis

Box 10.1 depicts the diagnostic criteria established by the American Psychiatric Association (APA) for confirming a diagnosis of depression.

Box 10.1 Diagnostic criteria of depression

Psychological/Physical symptom

1. Depressive mood*
2. Reduced interest/avolition*
3. Guilt
4. Suicidal feeling
5. Anorexia
6. Systemic malaise
7. Inhibition
8. Insomnia
9. Difficulty in concentrating

*Either 1 or 2 is essential for the diagnosis.

Depression is diagnosed when ≥5 of the above nine symptoms persist for two weeks or longer.

Depression is diagnosed when: (1) a depressive mood, or (2) reduced interest/avolition is present, along with the manifestation of ≥5 of the nine items of the diagnostic criteria depicted in Box 10.1, for a period of at least two weeks.

Confirming a diagnosis There can be problems in arriving at a diagnosis of depression in cancer patients. Depression is not always accurately diagnosed or treated, due to symptom overlap with other conditions presenting in patients undergoing treatment for cancer. In a survey of antidepressant administration to terminal-stage cancer patients, it was found that drugs were administered to only 6% and 3% of patients at six weeks and one week, respectively, prior to their demise [46]. In another survey, antidepressants were administered to 10% of terminal-stage cancer patients, but in 80% of these patients the drug administration was started only two weeks before they

passed away. This would not have been a sufficiently long duration for the drugs to take effect, since many antidepressants take 2–4 weeks to exert their effects [47]. However, patients may not be aware of their symptoms of depression, and many medical practitioners may be unfamiliar with these symptoms too, thereby causing a delay in providing effective pharmacotherapy.

The diagnostic criteria of depression include symptoms, such as systemic malaise, anorexia, and insomnia. However, these can also be symptoms directly related to the cancer itself or may develop as a result of the adverse effects of the treatment being given. In a survey of advanced cancer patients, malaise and reduced activity were present in about 80%, and anorexia and weight loss in about 50% [48]. Moreover, of the patients with depression who visited an outpatient clinic seeking treatment for physical symptoms, 69% reported only somatic symptoms at the first consultation. This may have reflected differing levels of awareness or understanding of the presentations by the patient or the clinician, or perhaps a lack of familiarity preventing effective doctor–patient communication, or it may have been due to cultural differences among the patients studied [17]. Symptoms of depression can overlap with milder mood symptoms that appear during cancer therapy, and it is often difficult to identify whether such symptoms are related to depression, or are due to the presence of the cancer or are caused by the adverse effects of treatment [49].

Regarding the ability of physicians and nurses engaged in cancer therapy to accurately evaluate depression, recognition of perceived depression by these health professionals was high when patients had no or minor depression but there was an underestimation of the prevalence, and severity of symptoms when the depression was severe [50,51].

Subsequently, even when a patient develops depression, its differentiation from physical symptoms of general physical diseases is often difficult, and symptoms of depression can be mistaken for those due to physical illness, because of the investigations and management being directed to treating a biomedical disease, thereby missing out the diagnosis and treatment of depression. Even when health professionals manage depression, it is likely that the judgement of its severity is inaccurate by those not familiar with the symptoms, thus leading to inadequate treatment.

Treatment

Drug therapy and psychotherapy are the main forms of treatment provided for depression. It is questionable as to whether depression in cancer patients can be treated in the same way as depression presenting as a separate entity, because in the former case, in addition to the depressive symptoms, the stress of having the cancer is continuously present during the course of treatment.

Regarding drug therapy for depression, significant improvement of the depressive state with mianserin compared to a placebo [52], and alprazolam compared with progressive muscle relaxation [53], has been reported. Similarly paroxetine and amitriptyline [54] have been reported to be useful in the management of depression in cancer patients. However, the evidence is sparse, warranting further investigation [55]. Furthermore, fluvoxamine has been found to reduce distress in cancer patients [56], with particular relevance to symptoms of adjustment disorder, and major depression, which can manifest when the patient is informed of the diagnosis of gynaecological cancer.

When providing further drug therapy, attention should also be given to whether patients have been treated by surgery along with radio/chemotherapy. If they have had treatment that has consequently lowered their capacity to metabolise these drugs, the adverse effects of the drugs are more likely to develop, and the dose should be tailored accordingly. Moreover, many therapeutic drugs are metabolised by liver cytochrome P450, and the actions of drugs may be potentiated or attenuated by drug interactions [57]. Therefore, pharmacotherapy should be given with due care.

For research on multiple drug interactions while providing cancer therapy, a group of Japanese scientists prepared a treatment algorithm for the management of advanced cancer patients, based

on their experience of treating cancer patients, and a relevant literature review. Its application was evaluated when patients undergoing treatment for advanced cancer received antidepressants for major depressive disorder [58]. Other than a high drop-out rate because of delirium due to the antidepressants, anxiolytics had to be added to the regime of a few patients, suggesting that further evaluation of such management is required.

A comprehensive meta-analysis of depression in cancer patients revealed a moderate beneficial effect of psychotherapy as part of the treatment regime [59]. When comparing the usefulness of various methods used for alleviating the symptoms of depression associated with cancer, the authors concluded that psychotherapy is useful not only for treating depression but also in increasing the effectiveness of other treatments. As with adjustment disorders, combinations of cognitive-behaviour and problem-based therapies, crisis intervention, and supportive psychotherapy are reportedly useful. The authors suggested further research to help differentiate between the effectiveness of the various types of psychosocial interventions.

The clinical vignettes 1 and 2 presented in Table 10.1 depict the management of patients who had psychosomatic manifestations after being informed of the diagnosis of gynaecological cancer and also during their treatment.

Table 10.1 Clinical vignettes (1,2) depict the management of patients with gynaecological cancer who had psychosomatic manifestations after being informed of their diagnosis

	Vignette 1: Psycho-oncology; urgent gynaecological outpatient department (GOPD) visit for postmenopausal bleeding: Asian	**Vignette 2: Psycho-oncology; a non-emergency GOPD referral for an abdominal swelling: Asian**
Presentation and management	*Mrs BL, a 68-year-old Asian woman, urgently attended the GOPD with postmenopausal bleeding* ◆ Mrs BL was physically examined and investigated when cervical cancer was confirmed ◆ She was informed of the diagnosis and a follow-up arranged but she did not return to the hospital ◆ After a year she plucked up courage, and attended another hospital for assessment but the cancer had progressed ◆ The cancer was considered inoperable so radiotherapy was given ◆ Three months after the radiotherapy was completed, aortic lymph node metastases were detected ◆ The nodes were treated with local radiotherapy ◆ Five months after the initial radiotherapy, pulmonary and mediastinal metastases were detected	*Mrs MP, a 64-year-old, Asian woman, attended the GOPD with complaints of her clothes getting tighter as her abdominal girth was increasing* ◆ Mrs MP's physical examination and further investigations revealed a pelvic tumour consistent with a right ovarian malignancy ◆ She was shocked initially and felt low in mood, but accepted the diagnosis relatively early and sought treatment ◆ A total abdominal hysterectomy, bilateral salpingo-oophorectomy, and partial omentectomy was carried out ◆ After surgery adjuvant chemotherapy was given ◆ She developed numbness of the limbs ◆ Pregabarin and duroxetin was prescribed but this caused sleepiness without improvement in the numbness in her limbs ◆ She became dysphoric, and attended the GOPD with dyspnoea but no physical cause for the symptoms was detected, and she was referred to a psychiatrist

Table 10.1 Continued

	Vignette 1: Psycho-oncology; urgent gynaecological outpatient department (GOPD) visit for postmenopausal bleeding: Asian	Vignette 2: Psycho-oncology; a non-emergency GOPD referral for an abdominal swelling: Asian
	◆ An interdisciplinary consultation concluded that further aggressive treatment would be of no benefit ◆ Seven months after the first treatment she was admitted to the palliative care ward (PCW) ◆ On admission to the PCW she complained of a lack of appetite and thoracic discomfort ◆ An examination confirmed that she was underweight with bilateral swelling of her lower limbs ◆ Haematological investigations revealed hypoalbuminaemia and slight renal dysfunction ◆ Computed tomography revealed a pelvic tumour measuring 10 cm, which had infiltrated the rectum, besides the periaortic lymph nodes, caused a hydronephrosis, pulmonary mediastinal metastases and bilateral pleural effusions ◆ In the PCW she wanted to lie on the bed all day and did not want to eat meals ◆ At her case conference one week after admission, the attending nurse reported of Mrs BL's constant complaint of throat discomfort, and requested a psychiatric referral ◆ The psychiatrist documented her complaints of malaise, anhedonia, reduced volition, insomnia, reduced concentration, and inhibition besides anorexia; a diagnosis of depression was confirmed ◆ She was started on paroxetine, 10 mg daily, and seven days after initiating treatment her thoracic discomfort disappeared, while after 14 days her insomnia and anorexia were reduced ◆ Mrs BL had acquired insight into her problem, and was motivated to sit up and eat meals ◆ She seemed to be recovering, and comfortable but six weeks after admission she had a massive melaena and passed away	◆ At the consultation with the psychiatrist she appeared nervous and complained of difficulty in breathing, numbness of limbs, and insomnia ◆ A diagnosis of anxiety and adjustment disorder was made ◆ She also complained regarding her previous medical treatments, and so her trust was first gained by active listening ◆ Further treatment was initiated by the psychiatrist with pregabarin, which was increased slowly from a starting dose of 25 mg to 150 mg over two months ◆ Her sleepiness and numbness disappeared ◆ Four months after initiating the psychiatric treatment she became calmer ◆ Long-term control of peripheral neuropathy-related pain led to a stable mental state

(*continued*)

Table 10.1 Continued

	Vignette 1: Psycho-oncology; urgent gynaecological outpatient department (GOPD) visit for postmenopausal bleeding: Asian	**Vignette 2: Psycho-oncology; a non-emergency GOPD referral for an abdominal swelling: Asian**
Biopsychosocial factors modulating the response to diagnosis and compliance with treatment	◆ Mrs BL's past biopsychosocial history was unavailable ◆ Her response to the diagnosis, and non-compliance reflected the shock to her mild-mannered, kind nature when informed of the diagnosis of cancer ◆ She could not attend the GOPD again and had developed dysphoric symptoms ◆ She could only overcome the shocked phase after one year when she went to another hospital for reassessment, and heard of the persisting cancer ◆ She agreed to treatment but the cancer had advanced far and curative treatment was impossible ◆ Palliative care helped her adjust better and she responded well to the antidepressants ◆ She seemed more comfortable in the PCW but succumbed to the malaena, which was terminal	◆ Mrs MP's past biopsychosocial history was unavailable ◆ She was fastidious and prone to anxiety and, responded with dysphoria during the management of her cancer ◆ On hearing the diagnosis of cancer she progressed from the shocked phase to the adjustment phase relatively early, partly due to her finicky personality ◆ Her personality may have also helped her comply with the management of receiving chemotherapy after major surgery ◆ Her personality may have interfered with acceptance of the chemotherapy after there were side-effects from it; anxiety increased her perception of numbness during chemotherapy ◆ The psychiatrist's assessment, management with active listening, and a gradual increase in the dose of pregabarin reduced her anxiety ◆ Gaining her trust facilitated care; the numbness of her limbs was no longer perceived
Impact on the healthcare system in providing patient-centred care	◆ After Mrs BL came to terms with her situation and agreed for intervention to treat her cancer she remained compliant to outpatient, and inpatient care ◆ Case conferences were useful in guiding her interdisciplinary management and were effective for symptom control ◆ The unusual complaint of throat discomfort which was confusing to carers was rightly diagnosed; antidepressants improved her QoL ◆ In Mrs BL's healthcare system additional costs for health and social care were not a hindrance for her treatment, as partially borne by the State	◆ Mrs MP came to terms with her situation relatively early and was compliant with the management of her cancer ◆ The side-effects of the chemotherapy prolonged her treatment as she needed further assessment/support to continue concomitantly ◆ Healthcare would be prolonged with a regular follow-up regime and if there were any recurrences there would be additional costs to the health service ◆ In Mrs MP's healthcare system, additional costs for health, and social care were not a hindrance for the management of her cancer as partially borne by her State

Table 10.1 Continued

	Vignette 1: Psycho-oncology; urgent gynaecological outpatient department (GOPD) visit for postmenopausal bleeding: Asian	**Vignette 2: Psycho-oncology; a non-emergency GOPD referral for an abdominal swelling: Asian**
Reflection: Could any other forms of management have improved the prognosis?	◆ Starting treatment soon after the diagnosis of cancer was made could have allowed for an earlier aggressive management of the cancer for Mrs BL as was possible for Mrs MP ◆ Ethical healthcare was provided to both Mrs BL and Mrs MP by respecting their wishes but it may be that further persuasion by other health personnel after gaining her trust could have influenced Mrs BL to seek treatment earlier ◆ Again whether earlier aggressive treatment would have altered the prognosis for Mrs BL will remain unclear ◆ Although the healthcare system provided tailored treatment to both besides allowing for a comfortable transition for Mrs BL to access palliative care, such care may not be universally available, and failing/underfunded health systems need to develop biopsychosocial care tailored to each cancer patient	

Learning points

Both Mrs BL and Mrs MP were provided with patient-centred, ethical care that was appropriate palliation. However, Mrs BL's delay in coming to terms with the diagnosis, and accepting treatment would have made her succumb earlier to the cancer while Mrs MP continued with symptom relief through palliative care. Psychosomatic management of both patients required individualised physical, and psychosocial support that was suitable to each one's circumstances.

Delirium

Delirium is frequently encountered in cancer treatment, and it is related to a reduced level of brain function due to various causes. Since delirium is associated with an increase in complications, long-term hospitalisation, and a rise in mortality [10], accurate diagnosis and appropriate treatment are of great significance.

Incidence

Delirium can occur at any stage of cancer treatment; an incidence of about 25% in inpatients has been reported [60]. The incidence is particularly high in the advanced and terminal stages, and the incidence increases as the condition progresses closer to death. It ranges between 28% and 44% among inpatients who are in palliative care wards, and in 68–88% just prior to their demise [9,10].

Clinical presentation

A disturbance of consciousness is the main symptom. This reduction of the consciousness level varies from a clear reduction to that detectable only by interview. In addition, psychiatric symptoms, such as visual hallucination, delusion, and excitement can be associated. Symptoms can vary within a day, from the patient appearing as almost normal to a presentation indicating an apparent delirium. Early symptoms may manifest as anxiety, a depressive state, anger, or other emotional symptoms. These symptoms persist for 2–3 days, and then may evolve to apparent symptoms of delirium in many patients.

The reduced consciousness level mainly consists of external cognitive disorder and disorientation. It is usually not accompanied by a severe disturbance of consciousness, such as coma. Clinically, there is hyperactive delirium with apparent abnormal behaviour, hypoactive delirium with discreet anomalous behaviour, and a combination of both [61].

Causes

The cause of delirium is multifactorial. It is believed that the interaction between various factors induces it. Factors are divided into predisposing factors, exhibited by patients before hospitalisation [62], and precipitating factors associated with admission to hospital, and their exposure to detrimental stimuli [63].

Predisposing factors include visual loss, severe illness, cognitive disorder, and renal dysfunction; precipitating factors include physical restraint, malnutrition, uses of three or more drugs, urethral catheterisation, and certain iatrogenic events. Direct causes include those associated with drugs being administered, altered metabolism from the cancer and its treatment, and infection [10,64].

Investigations

Since delirium is a functional disorder of the brain, when a symptom suggesting delirium is noted, the relevant investigations should be performed. In addition to evaluating the mental condition, the physical condition, including vital signs, should be examined, and haematological, biochemical, and imaging investigations carried out as indicated, as well as other specific tests suggested by the gradually evolving clinical scenario.

Drug-induced delirium can account for up to 40% of cases in patients with cancer. The time when the drug treatment was initiated, and the time-line that depicted the appearance of the symptoms of delirium, need to be analysed. Doses of suspected drugs which could have triggered the delirium, such as benzodiazepines, opioids, and anticholinergic drugs, should be reduced or discontinued, where possible.

Diagnosis

In assessing the symptoms, the DSM-IV diagnostic criteria and the Delirium Rating Scale (DRS) are used to reach a diagnosis of delirium [65]. When the consciousness level is reduced with various accompanying psychotic symptoms, the diagnosis is straightforward but in other situations, where symptoms are masked, as in hypoactive delirium, confirming the diagnosis can be difficult.

Therapeutic policy

Identification and treatment of the primary disease causing delirium and environmental adjustment are important [10]. Since multiple causative factors are implicated in many cases, it is necessary to carefully investigate to detect other causes, even after a cause has been identified [10]. Environmental adjustment is necessary for treatment because sensory blockage induces delirium.

In drug therapy for delirium, antipsychotics are the first choice. A commonly used drug is haloperidol, which is effective for various symptoms of delirium, and stabilises symptoms even before the treatment has produced its pharmacological effect on the causative factor/s. Other psychotropics, such as risperidone [66], and olanzapine are also used for the treatment of delirium [67]. As with the other drugs being administered, those selected for the treatment of delirium should be chosen after weighing their benefits against their adverse effects.

Extending psycho-oncological care to families of cancer patients

Burden on families

Cancer affects not only patients but others close to them, and its burden on close family/friends has an influence on the course of the disease, as well as on relevant social, and economic aspects of management. These in turn impact on the various daily living activities of these individuals who support the patient with cancer [68]. Although the finer details of such family care vary according to the local provision for each region, the overall burden on those close to the patient who officiate as their caregivers, are comparable.

Social effects

It has been reported that when a patient requires assistance from his/her family, 20% of families stop working or change their direction in life, and caregiving may become their main occupation [69]. It is estimated that 30% of families lose their main income bearer. Patients' families, particularly family carers, bear a heavy social and economic burden, such as abandoning their previous social lives, and occupations; hence, their liability increases.

Psychological effects

The patient's family takes on the care of the patient in many cases. However, they may also suffer from mental distress, since one of their family members has cancer, and consequently they too may develop anxiety, and a depressive state. The severity of the depressive state of the patient's family may even be comparable with that of the cancer patient. The depressive state in the caregiver usually persists, exhibiting ingression, and progression at various phases, such as when the patient is being investigated, when the diagnosis of cancer is confirmed, or when the disease recurs [70]. However, the distress of the families of patients tends to be underestimated [39].

In a survey of families of advanced cancer patients, 13% of caregivers were diagnosed with psychiatric conditions, but only half of them underwent any psychological intervention [71]. In another survey of caregiving family members of terminal-stage cancer patients, depression was noted in about one-third within one month of the patient's death [72].

Physical effect

In a survey of physical conditions in families of cancer patients, reduced immunity [73], heart disease [74], and chronic sleep disorder [75], were reported. Caregivers may also be suffering from cancer [76]. It has been reported that the mortality of spouses feeling the burden of caregiving increased by 63% compared with that in non-caregiving spouses [77].

Second order patients

The overall prevalence of psychiatric conditions in families ranges from 10% to 50% [78]. Caregivers bear a mental burden, and their psychological distress should not be underestimated. Families have been increasingly recognised as requiring treatment and care, and should be regarded as 'second order patients' [39].

Nevertheless, in a survey of families of patients treated at cancer centres in hospitals in Japan, only 2–3% of all families consulted the Department of Psychiatry, which was markedly lower than the number of patients treated for cancer [79,80].

Psychiatric intervention for families

For family intervention, multifaceted approaches, including paying attention to their physical, psychological, and social aspects of health are necessary [41]. A recent meta-analysis of families of cancer patients reported that early intervention is effective for stress relief [68], which supports the need for such healthcare provision. However, many families do not complain even if distraught, so attention should be given to enable the caregiver to talk about their anguish in order to avoid underestimating it [39].

Implications for bereaved families

Burden of bereaved families

Bereavement is a stressful life-event, and the death of a spouse is considered in most cultures as being the most stressful event in life [80–82]. The stress of bereavement affects members of the patient's family both physically and psychosocially.

Impact of bereavement

Physical impact

Bereavement can have a biological effect on a family member. Parkes et al. initially reported that the mortality rate of a 54-year-old or older men within six months after the death of their spouses was increased by about 40% compared with that in men with surviving spouses [82]. An increase in the mortality of women partners within three months after bereavement due to the demise of their spouses has also been reported [83]. The mortality of other members of the bereaved family soon after experiencing bereavement is also high [84,85].

After bereavement, the incidence of diseases due to physical ill-health increases, and there is aggravation of already existing diseases. There is an increase in the prevalence of heart disease and hypertension [72] in those who are bereaved, along with changes in eating habits, and an increase in alcohol intake besides cigarette smoking, which are risk factors [86] for various illnesses. However, the opportunity to visit a medical institution for an assessment decreases as they grieve [73,87].

Psychological impact

Bereavement also has a psychological impact. In a survey of the prevalence of depression after bereavement, reported by Clayton and colleagues, 42% and 16% of patients met the criteria for depression one month and one year after bereavement, respectively. In total, 47% of bereaved families experienced symptoms which met the criteria for depression, while this was 11% overall in the control group, showing that the incidence in bereaved families was very high [88,89]. Zisook and Shuchter also reported from a survey that the prevalence of depression in bereaved families was high, being 24%, 23%, 16%, and 15% at 1, 7, 13, and 25 months after bereavement, respectively [90]. In a meta-analysis, bereavement has been identified as the main cause of depression in elderly persons [91]. The risk of suicide increases within one year after bereavement [92–94].

In a survey of patients at psychiatric outpatient clinics, about 20% of patients retained the unresolved grief of bereavement [95]. Caution is particularly necessary for evaluating male partners for psychosocial problems because they visit medical institutions less frequently than women [95].

However, the bereaved can get distressed, particularly when the cancer trajectory of the sufferer who passed away is unclear to them, and further consultations to explain this along with medical counselling can be helpful [96].

Social difficulty

Bereaved families are also affected socially. The effect of social stress on bereaved families includes a negative impact on family members, difficulties in both social and family roles, changes in the living environment, inappropriate support, and economic difficulty [97]. Men do not ask for help, even though they are affected by bereavement and are aware of their difficulties [98,99]. Men aged ≤65 years were reported to be more likely to have problems, such as a depressive state, anxiety, and impaired social health when compared with older men [100].

Psychiatric intervention for bereaved families

Assessment

Bereaved families have medical problems related to both psychological and physical conditions. In addition, they have social and economic problems. Therefore, to assess the requirements of bereaved families, the assessment of all these aspects is necessary in order to organise adequate support.

When considering the psychological aspect, confirmation of the presence or absence of morbid grief, and depression in the bereaved is necessary. In a survey of patients at psychiatric outpatient clinics, in 17% of family caregivers, the unresolved grief of bereavement lingered on [95], suggesting that asking about bereavement-related problems when recording past medical histories is useful. Pharmacological treatment of bereavement-related depression is effective [101]. The grief from bereavement needs a different treatment approach than that followed when depression is being treated. Since a depressive mood, sadness, and social withdrawal are common to both depression and bereavement, careful assessment is necessary in identifying each type [102,103]. Additionally, caregivers experience psychological distress, particularly when the cancer progresses towards impending death. Effective interventions to increase the caregiver's strength and perceived social support could reduce the development of depressive symptoms in those supporting the dying process in cancer patients [104].

Regarding evaluation of the physical aspect, it is necessary to confirm whether an existing disease has been aggravated, whether the caregiver is continuing to visit a hospital for the treatment of an underlying disease as advised, whether a new disease has developed or whether the alcohol intake for helping cope with the grief of bereavement is within sensible limits.

In relation to the social and economic aspects, the relationship with family members, social relationships, any changes in the living and one's occupational environment, and the presence or absence of social support should be examined to plan further healthcare support with its economic implications. The confirmation of problems, such as job loss and financial difficulties, is also necessary. Spousal caregivers may need support, as they are psychologically connected to the patient who is receiving palliative care until their demise, and this may have generated psychosomatic symptoms, along with any financial difficulties [105].

Vignette 3 (shown in Table 10.2) elaborates problems experienced by a bereaved spouse caregiver.

Table 10.2 Vignette 3: Psycho-oncology—Problems of spouse caregiver and their management

	Vignette 3 depicts the management of the of the bereaved spouse caregiver
Presentation and management	*Mr CM, a 75-year-old Asian ex-President of a company, whose wife was a patient with gynaecological cancer and had passed away, consulted the Outpatient Service for Bereaved Families (OSBF), Department of Psycho-oncology, to discuss his wife's management* ◆ Mr CM suffered from diabetes and hypertension and his examination on the day confirmed findings within the normal range ◆ Regarding his wife's medical history, he mentioned that his wife had been diagnosed with cervical cancer five years back and that she underwent Wertheim's hysterectomy and radiotherapy ◆ She developed anorexia, general malaise, pain and then delirium and succumbed to metastases with pleural effusions and ascites ◆ Three months after his wife's death Mr CM consulted medical staff at the OSBF angrily and with distrust ◆ Mr CM felt that inadequate care by medical staff had accelerated his wife's death, and was dissatisfied with their management; he submitted a letter of complaint to the attending psycho-oncologist ◆ Although he expressed anger about his wife's cancer management, medical staff considered his behaviour as an adverse reaction to his wife's death. ◆ A diagnosis of symptoms of bereavement (DSM-IV-TR) was made ◆ Active listening regarding his thoughts about his late wife's cancer, and her nursing care was initiated ◆ Four months after his wife's death, he returned to the OSBF and consulted his wife's attending gynaecologist, Dr AS ◆ Mr CM had believed that his wife would get better after being treated by the gynaecologist, and had never accompanied her to the hospital visits ◆ Dr AS explained about the relentless course of his wife's aggressive cancer, which reduced Mr CM's suspicion, and his anger resolved ◆ Six months after his wife's death, he returned to the OSBF and consulted Dr AS saying that his absence at his wife's gynaecological consultations may have delayed the diagnosis of cancer but this was countered gently to change his way of thinking; instead his nursing of his wife was praised ◆ Seven months after his wife's death, he sent a letter of thanks to the medical staff saying that his wife received the best treatment from them ◆ Eight months after his wife's death, he spoke about having things to do in the future although with some regret about his wife's passing away
Biopsychosocial factors modulating his response about his wife's cancer management	◆ Mr CM's past biopsychosocial history was unavailable ◆ He had looked after his wife following his retirement but did not accompany her to her hospital visits so he had remorse ◆ He seemed to have guilt regarding this and wanted to vent his anger on the medical staff who looked after his wife ◆ 'Replacement' was used to stabilise him psychologically ◆ After several medical consultations he realised that he had not tried to understand cancer but was able to do so after his medical consultations ◆ Although he had some regrets about his nursing of his wife, the consultations at the OSBF were helpful, and his regret was minimised by the medical consultations
Impact on the healthcare system	◆ Several visits to the OSBF were needed to prevent Mr CM's regret turning into permanent guilt ◆ In his healthcare system there was no economic hindrance to the apt management of the symptoms of his bereavement but in many other healthcare systems worldwide this approach may have to be developed

Table 10.2 Continued

	Vignette 3 depicts the management of the of the bereaved spouse caregiver
Reflection: Could any other forms of management have reduced the impact of bereavement on this caregiver?	◆ Mr CM's regrets may have been minimised if he had been able to accompany his wife for her hospital treatments. Perhaps, there could have been correspondence from the hospital (with reminders) encouraging him to accompany his wife for her hospital visits; discussing about the prognosis with hospital personnel as the cancer progressed may have helped so that he did not cling to false hopes that the cancer would be cured

Learning points

Vignette 3 clearly reflects the doubts/uncertainties of Mr CM, the spouse care-giver who also feels that he did not give adequate support due to a lack of understanding of the prognosis of his wife's cancer; he blames the health-carers for her demise. He is only able to understand about his bereavement after discussing about his sense of loss, and then receiving psychotherapy from the oncologist who had treated his wife. Such specialized management is taught in psychosomatic training, and would benefit all bereaved individuals who have lost their partner to cancer.

Intervention

Concept and importance of intervention The demise of a family member due to gynaecological cancer impacts on the physical, psychological, and social health of bereaved family members. The bereaved require a certain type of intervention which is termed 'postvention'—a word coined from prevention and intervention. Postvention means 'appropriate support after a difficult event' and this was initially introduced by Schneidman [106]. Postvention aims at promoting the productive lives of bereaved family members by helping with reduction of their distress, and helps cope with the sequelae due to the demise of their family member who was suffering from cancer. This potentially results in increased longevity for the family caregiver. The concept of postvention is applied to intervention for bereaved families because bereavement is 'a difficult event'—a major life stress.

The end-point of intervention Regarding the end-point for intervention when providing healthcare to the bereaved family member/s one must keep in mind that grief resolves naturally in many. Therefore not all individuals providing care to the cancer sufferer benefit from postvention after they are bereaved, but such support should be available for those who seek it [107].

Conclusions

The psychosocial problems of gynaecological cancer patients have been highlighted. Many patients with gynaecological cancer have not only disease-related physical problems but also psychosocial distress due to psychosomatic interaction after acquiring the disease, and undergoing its complex interdisciplinary management. The early detection of their distressing biopsychosocial problems and appropriate timely patient-centred intervention is reportedly useful in improving the QoL of these patients. Family members caring for the patient, particularly the patient's spouse, can experience biopsychosocial distress during treatment, and if bereaved can be at increased risk of developing a malignancy. Therefore, the needs of the caregiver should be evaluated and support given if requested along with the tailored care for the patient with gynaecological cancer.

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Chapter 11

Psycho-oncology: the sexuality of women and cancer

Reiko Ohkawa

Introduction

Female patients who undergo treatment for cancer often experience significant changes in their sexuality due to the disease and its treatment. The term *sexuality* in this chapter relates to the sexual habits and desires of a person that includes sexual intercourse. Lack of interest in sexuality can occur in women when diagnosed with cancer or after its treatment, and it could present as sexual dysfunction. Although sexuality is considered an important component of well-being, progress in the treatment of sexual dysfunction among cancer survivors has lagged behind the advances made in other aspects of quality-of-life (QoL) for these patients [1,2].

Cancer survivors comprise a vast age range, and in addressing sexual dysfunction, it is important to consider problems specific to different age groups as well as individual differences. In adulthood, sexual function may be central to a patient's well-being. In some elderly patients, however, sexuality may become less important as intimacy with one's partner is achieved without the need to carry out sexual activity [3]. For young or preadolescent patients with cancer, preservation of fertility as well as sexual function is of considerable significance, and can be a challenge both for the patient and for her carers. A child would be unable to decide on what will be significant for her sexuality when she becomes an adult. Hence, a decision has to be taken based on the presumption that her parents, or the adults who care for her, can decide for her, and are cognisant of her future sexual needs. Moreover, for the female child or adolescent who is a cancer survivor, pubertal development may be closely linked to the shaping of gender identity, and her experience of the management of her cancer can modulate her sexuality.

Sexual dysfunction in cancer patients

Studies [3–6] have demonstrated that many patients, who have been sexually active, abstain from sex or have decreased sexual enjoyment following the diagnosis and treatment of cancer. Although, patients may indicate that sexuality is an important aspect of their well-being, their oncologists or other healthcare providers may not provide them with enough information about sexuality in relation to cancer therapy [3,4,7,8], thereby hampering their contribution to informed decision-making.

While cancer survivors may be free from many of the major side-effects of treatment within months of completing therapy, certain types of sexual dysfunction may persist following treatment, and can have long-term sequelae. Management of sexual dysfunction following cancer treatment is determined by the location of the cancer, its stage when treated and by the type of treatment given, and the patient's response to the management. More work [1,5,7,9] has been

done to study sexual dysfunction following the treatment of gynaecological cancer, including the management of breast cancer, compared with studying female sexuality after other cancers. One mechanism of sexual dysfunction following gynaecological cancer involves hormonal deficiencies, which can be remedied with pharmacotherapy but side-effects of such treatment can limit prescribing. Information regarding the pathophysiology, diagnosis, and treatment of sexual dysfunction is not disseminated widely, with many providers not making adequate provisions for the health-education of cancer sufferers. Hence, many patients continue to suffer needlessly, without broaching the topic, due to anxiety and embarrassment about their sexual dysfunction [7,10].

Timeline of cancer treatment and sexuality

When patients are informed of a cancer diagnosis, they are often so overwhelmed by concerns about their prognosis, and their early demise, that they do not reflect upon their sexuality. However, because sexual dysfunction can be pre-empted, and could be addressed earlier on during the discussion of the treatment of cancer, oncologists should raise this issue with interested patients when selecting the most appropriate form of cancer management [1,11].

Cancer treatments often lead to fatigue and depression, which can detract from sexual desire [12]. Both surgical treatment and radiotherapy can affect sexual function [13] in patients with gynaecological cancer. Surgical operations can cause pain, limit physical function, and alter the anatomy, with reduction of the vaginal length, which is further shortened by the fibrosis that is associated with healing [13]. Radiation therapy may lead to irritation or discomfort of the treated area, and the patient can have a distortion of the lower genital tract that can be worse than after a surgical intervention [13]. Loss of libido can follow both surgery and/or radiotherapy. Finally, patients can suffer from nausea, vomiting, or hair loss from chemotherapy that could eventually lower their self-esteem. Exhausted by their symptoms, patients may have a significantly reduced interest in sexuality, and may even fear that they will invariably experience sexual dysfunction that is irreversible [1].

From several months to one year after treatment, sexual dysfunction may be a central issue for many cancer survivors. At routine hospital visits during this period, it is appropriate for healthcare providers to ask about sexuality, assess any problems, and offer consultation and further information [1]. Many patients have hypoactive sexual desire disorder, and one of the main causes of this is anxiety due to a lack of information about the problem. This author, is often questioned about sexuality or receives comments from patients such as:

- 'Will having sexual intercourse make my situation worse? Can it lead to recurrence of my cancer'?
- 'I wonder if I have lost my sex appeal'
- 'I am reluctant to have sex after cancer treatment, but I am afraid that my spouse will leave me if I keep on refusing to have sexual intercourse'.

Husbands/partners of cancer patients may also have various anxieties about initiating sexual activity because they often do not receive counselling from physicians. The husband/partner of a female cancer survivor may feel embarrassed about initiating sexual intercourse, or he may abstain out of fear that it will harm her. When counselling on sexuality, the sexuality of the individual couple affected should be considered, and both partners' concerns should be addressed, rather than focusing only on the female patient [14].

At the terminal stages of cancer, a patient's physical status declines, and pain, emaciation, and depression significantly dampen sexual desire, or her sexual responses. However, couples, if interested, could benefit from frank discussions about sexuality even if the patient may be heading

towards the end of her life [15]. Furthermore, many patients could be sexually active if their pain was better managed [16]. In certain couples who were previously well-adjusted, alternative forms of sexual intimacy, even without sexual intercourse, can reduce physical and emotional difficulties that the woman suffering from cancer often faces [17,18].

Gynaecological cancer: surgical treatment and radiotherapy

Simple hysterectomy to treat benign or malignant gynaecological disease generally should have a lesser impact on sexual function [13,19] than more major surgery on the pelvic reproductive organs [20] such as radical hysterectomy. Some patients, however, have the misconception that sexual intercourse is not possible after a hysterectomy performed for uterine (endometrial) or cervical cancer. It is important to address any erroneous concepts during the medical consultations both prior to and after treatment, preferably in the presence of the partner.

After radical hysterectomy with surgical resection of the upper vagina for cervical cancer [5], interested patients would benefit from a discussion regarding how to recommence their sexual lives. They can be advised regarding specific sexual positions to enable intercourse following surgery or about the use of vaginal dilators to preserve the shape and capacity of the vagina. Autonomic nerve injury, and reduced blood supply to the genital area may impair female sexual arousal or orgasm. When discussing the resumption of sexual intercourse after the treatment of cancer, it has been reported that the neurological and vascular injuries associated with surgery that affect underlying physiological mechanisms are more salient in the male compared with that in the female patient [21]. Women are able to overcome autonomic nervous system injury if their tissues are healthy, whereas in the male who has had urological operations for cancer, it can lead to erectile dysfunction, which affects his sexual performance quite early when recuperating from cancer treatment, and impacts earlier on the couple's sexual relationship if both are suffering from cancer (see Chapter 10). Patients may also be reluctant to engage in sexual activity due to lymphoedema in the genital area or urinary incontinence that can also lead to dyspareunia [7,20,22,23], as reported with benign conditions that are related to female incontinence [24].

Table 11.1 Clinical vignette 1: A non-emergency gynaecological referral: British Caucasian

	Vignette 1: A sexually active woman who underwent radical hysterectomy that affected her sexuality
Presentation and management	*Ms RM, 37-year-old civil servant who lived alone was a nulligravida with a new male partner* ◆ Ms RM attended the gynaecology clinic with a general practitioner's (GP) referral because of her complaint of intermittent vaginal discharge for eight months; she had a past history of pelvic inflammatory disease but current investigations at the GP's surgery were negative ◆ She had regular monthly periods, was on oral contraceptives, and had regular smears ◆ Her general examination was normal; her vaginal examination revealed a normal looking cervix, a 1–2 cm granular lesion on the posterior fornix, a normal sized, mobile uterus with no adnexal abnormality ◆ A colposcopically directed biopsy including the entire thickness of the vaginal epithelium at the fornix along with a cervical smear was carried out ◆ A histology/cytology report from the biopsy confirmed: a poorly-differentiated squamous cell carcinoma, grade 2–3; the cervical smear was negative; the cancer was confined to the vagina (stage 1) and was <0.5 cm deep

(*continued*)

Table 11.1 Continued

	Vignette 1: A sexually active woman who underwent radical hysterectomy that affected her sexuality
	◆ Imaging studies, including an MRI scan confirmed no parametrial or pelvic lymph node spread ◆ A multidisciplinary meeting regarding the management was called to decide about surgery and/or radiotherapy ◆ The gynaecologist/oncologist informed Ms RM of the diagnosis ◆ Ms RM had a constellation of emotions; she was hysterical; was initially in denial, then was angry that it had happened to her; she had dysphoria (anxiety and a low mood); she was fearful that her relationship would be impaired by the disease and its treatment; she was afraid that she would lose her new job while on leave for her treatment ◆ At the hospital she had protracted discussions with a multidisciplinary team; she finally accepted a radical hysterectomy with upper vaginectomy and lymphadenectomy without intracavity radiotherapy ◆ Postoperatively she had urinary incontinence and wound problems; no infection was detected on cultures of specimens; the wound healed gradually with dry dressings after she was discharged home ◆ At her first outpatient follow-up visit, she was continent, and complained of a vaginal discharge; a healing granuloma was noted at the vaginal vault, and treated with silver-nitrate after taking routine swabs for culture; level 2 counselling for her continuing fear, anxiety, and mood symptoms was arranged ◆ Major sexual problems impinged on her relationship; her partner seemed unable to comprehend how events took over suddenly, and had doubted that she had been unaware of the cancer prior to starting their relationship; he later agreed to go for sex therapy ◆ There was a six-week wait for sex therapy but for Ms RM this 'wait was agony'; she lost her new job due to her absence for the cancer treatment; her GP prescribed tranquillisers ◆ She began building up her life gradually and became self-employed ◆ She continued with the three-monthly follow-ups required for the cancer surgery; she had persisting sexual problems but was able to cope; she came off the tranquillisers ◆ Her partner attended the couple sex therapy sessions; she felt he had become empathetic, and had learnt alternatives to sexual intercourse
Psychosocial initiating and maintaining factors	◆ Ms RM seemingly had a normal childhood and early adulthood with no records of behavioural/medical problems; she considered herself an 'introvert' who 'kept things to herself' ◆ She had used oral contraceptives since early adulthood as she wanted to remain child-free; her last relationship had been unsatisfactory and she had been keen to end it, and engage with her current friend ◆ Her psychosocial problems were initiated by the diagnosis of cancer while its treatment increased her physical problems; the cancer-related change to her body impacted on her relationship ◆ Her dysphoria after receiving the diagnosis of cancer had increased further after the surgery, and when she was discharged home ◆ Treatment-related body-image problems were evident; an impaired relationship and her job loss had a negative psychosocial impact; the cancer and its treatment had lowered her self-worth, and self-esteem ◆ She appeared very anxious and frightened but the continuing therapy helped her regain her fortitude
Impact on the healthcare system	◆ Ms RM suddenly needed comprehensive healthcare when being evaluated for a routine gynaecological complaint ◆ She was able to recuperate physically after the surgery but her psychosocial, and sexual problems needed considerable attention ◆ Additional costs for health and social care provision were added, and were expected to continue until she felt no further need for this help

Table 11.1 Continued

	Vignette 1: A sexually active woman who underwent radical hysterectomy that affected her sexuality
Reflection: Could any other forms of management improved the prognosis?	◆ The treatment of the physical effect of her cancer was apt. However, its impact on Mrs RM's body image may have been reduced if appropriate psychosexual treatment was provided earlier by the Health and Social care unit.

The clinical vignette in Table 11.1 illustrates the problems faced by a sexually-active woman who underwent radical surgery for vaginal cancer, which then affected her sexuality.

Learning points

Ms RM on a clinic visit for a routine gynaecological complaint was found to have a vaginal malignancy that needed radical surgery. She had to make an informed decision soon, and then learn to accept the changes to her body after surgery, and cope with the complications from the surgery. Her sexuality was affected and it impacted on her new relationship. Besides the follow-ups (3 monthly followed by 6 monthly) necessary after the treatment of her stage 1, early vaginal cancer [25], she needed sex therapy to deal with her relationship problems. She had decided not to bear children, and her sexuality was important for her wellbeing. The psychosomatic approach in the consultations persuaded her to accept the management of her rare cancer (1–2% of gynaecological cancers), come to terms with the treatment-related alterations of her body-image, and overcome her apprehension about her sexual interactions. Ms RM made an informed decision to have surgery instead of radiotherapy to give her a better chance to have intercourse after it healed.

Radiation therapy to the pelvic area can generate fibrosis of the vaginal wall, decrease the vascular supply to the genital organs, and reduce the elasticity along with the capacity of the vagina; these changes can then cause dyspareunia [12,23]. Use of vaginal dilators during the early stages of recovery from radiotherapy is therefore advocated to prevent long-term sexual dysfunction [4,21].

Oophorectomy and pelvic irradiation induce the early onset of the menopause, which can also impair sexual function. Patients and oncologists need to discuss preservation of ovarian function before starting cancer treatment. In the case of radiation therapy, where the preservation of ovarian function is the goal, the ovaries can be moved outside the field of radiation at the time of the operation to avoid damage from postoperative radiotherapy. If ovarian failure does occur, hormone replacement therapy can be prescribed [21] for those who have no contraindication. The discussion about this should begin early when discussing the management plan and probable outcomes with the patient.

Finally, if patients recovering from gynaecological cancer do have dyspareunia, it is important that they (along with their partners) are educated about intimate touching and other alternatives to intercourse until the pain subsides. Alternatives to sexual intercourse can build up trust and intimacy, and encourage further sexual interactions during the course of the disease. This could gradually proceed to painless intercourse.

Mrs RW's urgent, appropriate treatment was necessary but her employers were unsympathetic. Certain employers could do more to retain experienced staff who undergo necessary treatment.

Bladder and colorectal cancer: surgical treatment and radiotherapy

The removal of the bladder, colon, or rectum tends to influence female sexual function less than the loss of the uterus and vagina. Nevertheless, irradiation to the pelvic area for bladder or colorectal cancer may induce ovarian failure and/or vaginal fibrosis similar to that observed during the treatment of gynaecological cancers [21]. When patients undergo cystostomy or

colostomy, they may suffer loss of sexual interest due to poor body-image, anxiety about leakage of urine/excrement or the accompanying malodour. This may lead to sexual dysfunction due to a hypoactive sexual desire disorder that causes insufficient lubrication, and leads to dyspareunia [8].

Breast cancer: surgical and hormonal treatment and radio/chemotherapy

A number of medical practitioners believe that breast cancer survivors do not face sexual dysfunction because their treatment does not involve the pelvic reproductive organs. Such a point of view that is recognised in Japan, is perhaps culturally relevant. Worryingly, it also relates to the view of some oncologists who consider that female sexual function is only related to her ability to have sexual intercourse, and as treatment of breast cancer does not compromise her ability to do so, she should not have sexual dysfunction after lumpectomy/mastectomy and related adjunctive therapy. However, relevant studies, including from Japan [3,26,27], have established that sexual dysfunction among breast cancer survivors is widespread, and can be severe. The main problem lies in the patient's lowered perception of her body-image, and her lack of confidence in her sexual performance after undergoing relevant surgery for her cancer. Moreover, believing that she has lost a symbol of femininity, the patient may be hesitant about becoming sexually active again following mastectomy or lumpectomy [10]; this viewpoint could be promoted by certain cultural concepts with variation among different population groups.

In breast cancers assocciated with oestrogen positive tumour cells, hormonal therapy that suppresses oestrogen production can lead to sexual dysfunction. Furthermore, gonadotropin releasing hormone (GnRH) agonists, and aromatase inhibitors induce temporary ovarian failure [28]. Prescribing of selective oestrogen receptor modulators (SERM), such as tamoxifen, in the management of breast cancer with oestrogen positive tumour cells is controversial. Tamoxifen has actions similar to that of GnRH agonists in premenopausal women, but it shows some oestrogenic effect on the uterus and vagina of postmenopausal patients [29,30]. Although tamoxifen halves the risk of breast cancer, it can increase the risk of endometrial cancer [31], and such a risk reportedly increases during 5–14 years from the start of taking it continuously. Moreover further implications for the management of endometrial cancer that has developed as a result of treatment with tamoxifen need to be considered. Raloxifene, a second generation SERM, has similar effects to tamoxifen on invasive breast cancer [32] but a higher risk (non-statistically significant) of associated non-invasive breast cancer, and a lower risk of developing uterine cancer when compared with tamoxifen; again sexuality could be affected.

Leukaemias and lymphomas: radio/chemotherapy and surgical treatment

In the treatment of leukaemias and lymphomas, whole body irradiation is given prior to bone marrow transplant, and this may result in ovarian failure. Chemotherapy may affect the gonads to varying degrees, ranging from a temporary cessation of menstruation to premature menopause. Additionally, chemotherapy for paediatric malignancies may cause primary amenorrhea or a premature menopause [33,34].

Both whole-body irradiation and graft-versus-host disease after a bone marrow transplant can induce vaginal scarring, adhesions, and fibrosis that can contribute to dyspareunia [23]. Early use of a vaginal dilator can help to avoid this unsatisfactory outcome. Therefore, routine gynaecological visits following cancer therapy may be useful in providing necessary advice regarding interventions to prevent future sexual dysfunction, even for young patients. Treatment of paediatric malignancies may also affect the development of sexuality and sexual identity. Survivors of

childhood cancers suffer from a high prevalence of psychosexual problems, and exhibit a tendency towards delayed psychosexual maturity. When working with paediatric patients with cancer, preservation of healthy sexual development should also be given due consideration [35].

Adolescents and young adults (15–29 years) with malignancy [36] are a group with different/additional needs when compared with older adults or children who have cancer, and understanding their illness behaviour can be challenging. They are particularly at risk of leukaemias, lymphomas, melanomas, and germ-cell tumours (ovarian or testicular), besides cancers of the breast, cervix and thyroid, all of which can compromise sexual health and fertility, for the female and her partner. Also, conveying the diagnosis of a malignancy and its probable treatment can have a profound biopsychosocial impact, leading to anxiety, depression, post-traumatic stress disorder and/or drug misuse, which may prevent compliance with the treatment advised. Loss of reproductive capacity due to the effects of the cancer or its management can further impact on sexuality and well-being. This may lead to great despondency and suicide ideation, which requires considerable attention by healthcare providers.

Hormonal deficiency

Bilateral oophorectomy, pelvic irradiation, chemotherapy, and antioestrogen therapy for cancer treatment may all cause ovarian failure and hormone deficiencies. Testosterone, present both in women and men, has a role in the maintenance of libido, being also an oestrogen precursor. Hypoactive desire disorder and depression after bilateral oophorectomy can be ameliorated by testosterone replacement, although the response varies between individuals [23]. In a 52-week study [37] of postmenopausal women, testosterone patches (150 or 300 μg daily) were provided, and compared with a placebo group. Adverse effects were noted in approximately 82–84%, which were severe in 3%, associated with hirsutism in 10–20%, and irritation at the application site in 50% but withdrawal from the study due to side-effects was required by only 13–19%. Satisfactory sexual encounters occurred when testosterone patches were used but the effect was moderate, and the authors suggested further studies.

Oestrogen deficiency can result in an abrupt onset of the menopause, and the resulting fatigue, hot flashes, and other symptoms of autonomic dysfunction also suppress sexual desire. One immediate and significant result of oestrogen failure is vaginal atrophy, leading to inadequate lubrication and dyspareunia [23]. Oestrogen replacement therapy via various routes of administration is effective for these complaints. This treatment is however, contraindicated in women who have had breast and endometrial cancers that are oestrogen-sensitive. Lower-dose oestradiol and oestriol if applied transvaginally is a safer therapy, and may dramatically relieve dyspareunia [38]. Water-based lubricants, and vaginal moisturisers are also safe and useful approaches to achieve lubrication, and may be used alone or in combination with oestrogen [21]. Nonetheless, such pharmaceutical therapies alone are not sufficient to treat sexual dysfunction. The female sexual response—the cycle of desire, arousal, and orgasm, depends upon numerous factors. Pain, for example, consistently reduces sexual response, and needs to be alleviated satisfactorily. Additionally, sexual counselling of intimate partners to cultivate optimal body touch routines may encourage sexual interactions to a greater degree than hormones or lubricants, and this behavioural approach needs further recognition.

Medication and sexual dysfunction

Under certain circumstances, it is not only the treatment of cancer, but also the medications given to improve the patient's QoL, that contribute to sexual dysfunction. Opiates, antidepressants, and antiemetics may cause decreased libido [21]. Selective serotonin receptor inhibitors (SSRI)

directly induce hypoactive sexual desire disorder by suppressing gonadal production of testosterone, which causes a loss of sexual desire [39]. Moreover, a review of all the medications that the patient is taking, should be carried out at intervals to detect if any drug whether solely or by its interactions with other drugs is resulting in a hypoactive sexual desire disorder.

Fertility preservation

A patient whose fertility is not compromised by her cancer therapy should be informed about the possibility of becoming pregnant after the therapy is over, and advised about the required duration of contraceptive use that would be necessary to prevent any teratogenic effects on a fetus that was conceived. There are many recent advances in methods for preserving fertility following cancer treatment [34,40]. One strategy is to use a GnRH agonist [41] to protect the ovaries during chemotherapy. Cryopreservation of ovarian tissue or oocytes for *in-vitro* fertilisation after cancer treatment is being carried out, although the techniques used are more complicated than those used for sperm preservation [42]. Oncologists need to consider the importance of preserving fertility [20] when planning the treatment strategy for the patient with cancer. There are difficult ethical issues [34,40] to address regarding the use of assisted reproductive technology (ART) besides the preservation, and use of germ cells. Children and adolescents need the support and assistance of their parents when making choices about fertility preservation.

Educating healthcare providers

Ideally, a team of healthcare providers should handle the sexual rehabilitation of cancer survivors, based on the history of their disease, and the timeline of progression [1]. One study has demonstrated improvement in sexual functioning of cancer patients following group education about sexual issues [1]. However, counselling should also be available to patients on an individual basis [11]. If no healthcare team is available for joint consultation to provide sexual rehabilitation for these patients who have undergone treatment for cancer, a medical professional, nurse, or psychologist qualified to provide a sexual health service should address the patient's issues. In the author's experience, a large proportion of medical professionals hesitate in discussing sexuality with their patients. Often, they cite various reasons for this reluctance, including their own embarrassment about the topic, and their busy work schedules; by far the most common reason they give is that they have not been taught about sexual issues related to malignancies [10].

A healthcare provider who is new to sexual counselling may begin by asking patients about their sexual problems, bearing in mind the principle that sexuality is an important health issue [43]. Patients rarely become upset at being asked a frank question about sexuality, as long as the question is put forth in a way that is not overbearing. For any counsellor, it is essential to respect the privacy of patients, and because of this, it is important to conduct the interview in a room where privacy is assured. Another principle of sexual counselling is to maintain an ethically neutral stance, and to refrain from criticising the patient. Sometimes the simple act of listening to a patient can be therapeutic for them. Patients may develop their own strategies to manage their sexual dysfunction merely by having a frank discussion with a health professional.

The PLISSIT model of interventions (Table 11.2) as developed by JS Annon [45] is depicted next.

Table 11.2 The PLISSIT model: a framework to guide interventions for sexual dysfunction

P (Permission)	Giving the patient permission to talk about sexual issues
LI (Limited Information)	Giving the patient basic factual information in response to a question
SS (Specific Suggestion)	Making a specific suggestion to the patient, an intervention that requires a higher level of expertise
IT (Intensive Therapy)	Referring the patient to a specialist for severe sexual problems

'*Permission*', refers to the healthcare provider giving patients the opportunity to talk about any sexual problems when they are visiting for a routine health check-up. Simply asking the patient about their sexual health serves as 'permission' because most patients are unlikely to talk about sexuality if not prompted by a healthcare provider [11,44]. The second level, '*Limited Information*', refers to giving basic information about sexual function and dysfunction. '*Specific Suggestion*' and '*Intensive Therapy*', are sophisticated interventions for more difficult and complicated sexual problems. At these levels, patients are referred to a gynaecologist with psychosomatic expertise or a sex therapist to help resolve such problems.

The model is a framework of interventions to be carried out by health professionals to address sexual problems. It illustrates the skills required to tailor treatment to the range of sexual problems encountered in a patient, ranging from the simple to a complex case scenario. The steps in the management provided by suitably trained health professionals, start from basic help to increasing levels of expertise in the treatment offered [45].

The focus of this discussion pertains to the population of female cancer patients with sexual dysfunction who represent a unique group. Studies on this group are limited compared with those on cancer-related sexual dysfunction in males [7,21]. One reason for this is that the sexual functioning of males is evaluated more easily. Additionally, even scientific research into sexual function seems to assume that sexual intercourse is central to sexual behaviour. It is well-established for many females [46,47] that intimate touching and emotional closeness are more important components of sexuality than sexual intercourse. A recent study on female sexual response demonstrated that sexual desire is not spontaneous, but rather that physical or mental stimulation by an intimate partner produces sexual arousal and desire [47]. This would also be applicable to the management of female sexual dysfunction due to the impact of cancer; time is of the essence in providing an improved QoL for many patients residing at home who prefer to avoid hospital/clinic visits. Again, exercise may be crucial in improving the HRQoL of many patients with cancer, as it has a positive effect on body-image and self-esteem as well as sexuality, emotional health, and social functioning; such evidence nonetheless, is sparse [48].

Conclusions

There is little disagreement that sexuality comprises an important part of QoL for cancer patients, but the sexual health of the female patient with cancer is given comparatively less attention during the medical treatment of her illness. Both medical and surgical treatments, along with adjuvant therapy such as radiotherapy and hormonal treatments, have an impact on the sexuality of the patient. Vignette 1 (Table 11.1) illustrates a clinical scenario where gynaecological cancer affected the patient's psychosomatic health, and impacted on her relationship and her employment.

Moreover, the age-related needs when treating the female with cancer can vary between different age groups. Certain specific requirements of female cancer sufferers vary from when she is a child to growing into the teenager/young adult, and then the older or postmenopausal adult; these require individualised assessment, and treatment. The impact on the male of the female partner with cancer, deserves further attention to help enhance the couple's relationship. Counselling

remains an important aspect of couple therapy. The PLISSIT model can provide a framework to guide interventions.

To promote the sexual health of female cancer patients, it is necessary to explore what females want from sexual relationships. Investigating sexual dysfunction, and its association with specific cancer treatments deserves further attention.

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Chapter 12

Migration, gender, and cultural issues in healthcare: psychosomatic implications

Mira Lal

Introduction

Human migration involves a shift to a new location that is permanent or semi-permanent. It could be on an individual basis, in small groups, or in large numbers, with the populace being driven by economic necessity, sociocultural strife, or due to the effects of war. Population shift and sociocultural strife can contribute to the generation of physical and mental disease, with sufferers making excessive demands on healthcare resources. The breakdown of personal and social support networks in mobile populations [1–4], exposed to constantly changing urban agglomerates [5], can initiate and maintain psychosomatic manifestations that have both individual and collective health implications. These unsettling environmental situations are usually associated with urbanisation when members of a rural populace move to cities [3,6,7], or from one country to another. Consequently, such health conditions would be expected to be more common in emigrants. Besides, resettling can aggravate biopsychosocial health problems by affecting lifestyles [8,9] along with the creation of personal and social rifts in the migrant's emotional support structure, thus compromising the individual's ability to cope with stress—a common feature of contemporary lifestyles. Under these circumstances, a supportive social restructuring has to be configured, once again.

This transitional phenomenon of readjustment associated with migration, fuelled by a need to emigrate to gain economic/social advantage in order to improve one's living conditions [2,6–8], or to flee the effects of continuing warfare [10–14], is usually stressful. Oddly enough this is also associated with migration from urban to rural areas [4]. In this context, populations moving primarily for economic advantage are referred to as economic migrants, whereas those migrating due to continuing warfare are often referred to as refugees. Although the challenges associated with any form of migration may be similar, refugees are at a greater social disadvantage despite international regulations framing resettlement, for they may have experienced greater trauma prior to their unplanned move [10–13], which initiates specific biopsychosocial needs. Many migrants may have undergone long journeys, sometimes perilous, in order to reach their destination, often leaving behind most of their possessions. When planning healthcare for displaced populations however, clear delineation of the characteristics of the migrant populations being served by the relevant healthcare facility, may not always be possible. This unfamiliarity with the population being attended to may be highlighted during medical emergencies, especially those associated with continuing armed conflicts, when a geographical reconfiguration of healthcare provision within and outside borders, referred to as 'therapeutic geography' [14], occurs.

Continuing warfare can also affect functioning of the medical workforce [15], and lead to disruption of health services, with a consequent increase in patient morbidity/mortality due to the inevitable lack of effective medical care.

The health issues related to population shift, as currently occurring in war-ravaged regions [10,14] in Africa/Asia with many migrants trying to reach Europe, are not new to mankind. Mass movements relating to migrations between continents, and also from rural to urban settings [3,5–9], have occurred in the living memory of many, having started in the twentieth century or even earlier, particularly in Europe, North America, and Australia [3,5–7]. This brought with it multifarious effects on the physical and psychosocial health of settlers [16,17]. Latterly (since 1950), this phenomenon of mass migration and its consequences has been observed in Asia, the Middle East, and Latin America, with many facing challenges when moving to an urban township (population of ≥20 000) or a megacity with a population of 10 000 000 or more [8,18]. Settling at an unfamiliar destination entails a necessary modification in the migrants' previous lifestyle in order to suit their new environs, and for it to be acceptable by those already settled there. Such a move can, however, be disconcerting, especially to migrant families, and in particular to those with young children, who could be exposed to health risks caused by congestion, environmental hazards, violence, and other crimes [2,17]. They can also be marginalised if they have a low-income, with lack of access to adequate housing, basic infrastructure, and services [19]. The ease of speedier regional and global travel in modern times, along with more rapid economic upheavals arising from political instability, have magnified the associated health hazards with both diseases of the affluent or of poverty affecting migrants [18]. The overall impact of migration that results in sociocultural rifts, often with economic uncertainty, may generate psychosomatic diseases with implications for global healthcare.

In general, migration driven by economic forces not only leads to alterations in traditional relationships, which maintain health, but also adds a further burden on those migrants who have to endure economic hardship. They may have to wrest with expectations beyond reach, because of unanticipated hazards when adapting to the new environment, along with the higher costs of living in their adopted metropolis that could be economically draining [2,8,9]. Some migrants may become part of an urban underclass [18,19], which can in turn impact on maintaining good physical, mental, and social health. Stress-related health issues can also be exacerbated by the chaotic lifestyle followed by many of the economically constrained [20], and the emotionally vulnerable. Teenagers may be particularly at risk with some becoming the victims of drug and sex traffickers [13–15,20], and may acquire complex health conditions when compelled to work for unscrupulous gangsters out of economic necessity. High-risk behaviours can compromise not only physical but also mental well-being, especially if such behaviour leads the unsuspecting to involuntarily acquire health conditions that need comprehensive healthcare because of enduring detrimental effects. These treatments could be related to the management of hepatitis from drug misuse [21], liver damage from alcoholism, unwanted pregnancies, HIV and sexually transmitted infections (STIs) [22–24], besides other infectious, traumatic, or psychosomatic afflictions. Thus, the multiple physical [23,25] and mental needs [26–28] that are created in migrants by their move merit recognition, to enable reduction of the associated morbidity.

The collateral effects of migration therefore, can in the women exposed to such psychosocial adversity, lead to complex obstetric and gynaecological complaints. This would bring about repetitive help-seeking behaviour, and affect the individual's, immediate and extended family members. The culmination of these issues in various population groups would leave a large disease burden on healthcare providers who would then have to promote not only physical but also mental and associated social health. Consequently, this would have the propensity to create a snowballing demand on the provision of healthcare that affects both local services, and any referrals for more

specialised health advice, outside the region. Such needs could be magnified [9] when migrants acquire diseases that persist, and have long-term effects [25,26,29]. Additionally, global travel could facilitate transmission of an infection such as HIV, when migrants acquire an infection during a temporary visit to a highly infectious area, return infected but unaware, back to their adopted country. They could potentially infect others, while the 'silent disease' eludes early detection, until it progresses to detectable, more lurid manifestations. These complex disease conditions, which require somewhat intrusive investigations with sensitive, individualised evaluations, can benefit from the psychosomatic approach [30] that emphasises this. Health professionals involved in the management of migrant adult women, teenagers, and children with these diverse health requirements would benefit from acquiring relevant expertise.

This chapter attempts to relate mainly to the health problems of economic migrants who seek treatment at large hospitals in megacities. However, there is overlap with the care provided to refugees residing in megacities, who may also need to attend these hospitals. There is inclusion of the case scenario of an adolescent migrant with a serious health condition who was treated in a small hospital in a county town; it highlights the fact that severe clinical conditions can arise as urgent emergencies outside megacities, and appropriate care has to be provided urgently as immediate transfer to hospitals providing secondary/tertiary healthcare may be impossible. Hence, health planning should take into consideration local clinical requirements, which include provision for managing clinical conditions that need comprehensive medical expertise/facilities, as a matter of urgency, even at smaller health facilities. Evidence does not yet confirm that a current trend for hospital mergers to form fewer larger hospitals to centralise services, which inevitably restrict patient access and choice, is necessarily cost-effective, particularly where the population is scattered. Seven vignettes illustrate the relevant theoretical issues being considered.

Global aspects of gender-related health issues

International organisations such as the World Health Organization (WHO), the United Nations (UN), and the International Federation of Gynaecology and Obstetrics (FIGO), have been at the forefront in trying to address the global aspects of gender-related health issues. They have issued directives and guidelines about prevention, detection, and management of such disease conditions, with the WHO initiating 'The Beijing Declaration and Platform for Human Rights' as early as 1995 [31]. Their aim was to enable the global population attain positive physical, mental and social health, with streamlining of finite resources so as to focus on these causes rather than on other competing interests. The Platform for Action [31] included 12 critical areas of concern that are relevant even now, and include the themes of education and training, health, violence, armed conflict, human rights, the rightful place of a female child, etc. Each concern had strategic objectives for detailed action by Governments and stake holders alike. Nonetheless, this has yet to be realised by many nations.

The strategy for promotion of comprehensive health [32], the eight Millennium Development Goals (MDGs), which included directives for specifically improving the health of women and children, was set up in the year 2000, and further subclassified into targets. The MDGs related to goals 3–6, which addressed gender issues, abortion, maternal and child health, were considered relevant for this purpose. Awareness of these MDGs was further increased by discussions at relevant international scientific meetings [33,34], along with a growing body of associated literature published and/or displayed online by interested organisations. A proposed deadline of 2015 to achieve the MDG-targets was agreed upon by all participating nations (n = 192), who were to muster manpower and technology to reach these goals. Although the need to implement these targets was accepted by all participating nations, the large disease burden already existing in many

countries along with inadequate funds, and lack of skilled work force to deal effectively with the problems, delayed steady progression [35]. In addition, the political will to achieve these goals was lacking, especially in those nations that were affected by continuing warfare [14,36] and/or political corruption with poor governance [37], thereby impeding progress. Moreover, attending health professionals felt a sense of disappointment at the less than optimal health outcomes. This was particularly relevant if they had to work in troubled regions, where they could not prevent the negative social influences on the population's health of a continuing migration due to conflicts or natural disasters. Health professionals practising in these areas of sociopolitical turmoil, or with natural calamities due to the effects of global warming, have had to continue to deal with these emergent health conditions [38], even at the cost of their own well-being [15] or perhaps their lives. Provision for migrant populations with specific healthcare needs still needs to be addressed.

This is of particular relevance to obstetrics and gynaecology. Strategies to provide effective healthcare to women, even in countries with continuing social/political upheavals, were included in the manifestos of FIGO, as well as the National Obstetric and Gynaecological Societies of many nations worldwide. Since their first meeting in 2002, 174 nations met again to discuss the progress in the implementation of the MDGs and found the results unsatisfactory [39,40] in certain respects. Despite a three-year independent advisory project being set up by the Secretary General of the UN to identify practical steps to achieve the MDGs, several countries were off-track in their progression. It was observed that progress with certain MDG targets was encouraging in certain countries, such as Sri Lanka, Thailand, Bangladesh, Nepal, Fiji, and southern Sudan, while Malawi was well ahead [41] of the agreed deadline. However, advancement was slower in countries where there have been continuing conflicts such as Somalia, Nigeria, Sierra Leone, Congo, Northern Sudan, Ethiopia, and Afghanistan. The impact on the populations' psychosomatic health due to warring factions in the Middle-East remains to be evaluated. The sociopolitical state still remains fluid in these countries, with continuing political instability.

Member nations of FIGO met again in 2015 to evaluate the progress made [42] in reaching MDG targets by many nations. Based on these evaluations they formulated further measures to promote women's health. During this appraisal, they also addressed issues created by those countries who could not reach the MDG targets. Future plans included reducing maternal and infant mortality further, while following the UN's new strategy [43] of Sustainable Developmental Goals (SDGs). The SDGs also included additional tropical diseases besides the eradication of poverty [44] with a global agenda that were not represented in the MDGs.

Notwithstanding their intentions to advance steadily, more initiative and political will is still required in several countries to overcome the sociocultural and economic barriers to providing services, in order to reduce their biopsychosocial disease burden. There is increasing recognition of the premise that expanding the health agenda by appropriate capacity building can improve the health of women and children. Howbeit the practicalities of contrary competitive outsourcing in healthcare provision is yet to be deciphered.

Gender-related health issues in psychosomatic obstetrics and gynaecology

Among the psychosomatic women's health issues created by the fragmentation of personal/social relationships, gender-related issues predominate. The influence of gender-related issues in the genesis of physical, mental, and social ill-health with comparative disparities among the sexes in many communities are discussed here first [45]; the biopsychosociocultural aspects of female genital mutilation (FGM) [46], is also included in this subsection. Relevant issues related to termination of pregnancy (abortion) [47,48] then follow. These heterogeneous matters impinge on the

health of both apparently settled as well as mobile populations, with greater health risks to those displaced communities who have to reside in temporary shelters [12]. Understanding the intricacies of managing these physical and mental health conditions, predisposed to by the influence of altered environmental factors associated with population shift, would help clinicians in advancing positive health. Relevant psychosomatic training of health professionals would facilitate appropriate management of these gender-related health issues that can affect both the settled as well as migrant populations that seek healthcare.

The following mission statements from international organisations regarding gender-provoked violence emphasise its importance in promoting positive physical, mental, and social health:

- **The UN**—'*Violence against women is a violation of human rights and its reduction is a key strategy for achieving the Millennium Development Goals*' [49], now being carried over to the SDGs.
- **FIGO**—The priority is to '*Address the barriers of clinicians to respond to violence against women through the use of advocacy, training and services*' [50]. Elimination of violence against women continues to be highlighted on commemorative occasions/days such as the International Women's Day (WHO, 8 March 2008) or the International Day for the Elimination of Violence against Women (25 November 2016). Progress in creating awareness and developing support systems has been prioritised in many countries, including the UK, where there is recognition of these issues by the government. Nonetheless, further psychosocial issues continue to evolve, particularly with population shift and changes in the economy, generating recurrent health issues that need to be addressed contemporaneously. The National Institute for Health and Clinical Excellence (NICE), UK, developed relevant guidelines after public consultation, yet more has to be done to educate healthcare professionals [51,52] to deal effectively with women's ill-health created by gender violence. Many women experiencing such violence are gagged by social norms, and health professionals can be unprepared when dealing with the subject matter, thereby ignoring/avoiding the topic in clinical encounters. However, physicians are ethically bound to recognise the physical and psychological effects of violence [52,53], treat victims accordingly, and give referrals for accessing social structures that can reassure/counsel them or facilitate transfer to a refuge (safe house).

The aetiology of clinical presentations of gender-related health issues

Before proceeding further, pertinent definitions, which relate to the subject areas to be discussed are now presented. This facilitates the understanding of the specific topics that contribute to psychosomatic clinical manifestations.

The term '*Women*' is used to refer to one's '*sex*' [54], which can be defined as '*the relatively unchangeable biology of being female or male*'. Nevertheless, a broader more pragmatic view can be presented by addressing '*gender*'. '*Gender*' refers to '*the roles and expectations attributed to men and women in a given society and varies with the roles, norms and values of a given society or era*'. There is an interconnectedness of sex and gender in the generation of clinical presentations, e.g. in victims of assault, who may then go on to develop symptoms of psychosomatic disease.

'*Violence*' in relation to the female gender refers to '*an attack on the woman's physical, sexual and emotional well-being*'. '*Domestic violence*' can be defined as '*the physical assault at home by an intimate partner or a family member*', but may also include '*sexual or emotional assault, and economic abuse*'. '*Sexual violence*' or '*rape*' relates to an offence where '*sex is carried out without the victim's consent*'.

Physical and sexual violence are expressions of gender violence with the victim more commonly being the female; uncommonly males can be affected [55], with the perpetrator being

a female, or another male [56]. Gender issues are increasingly being recognised as important determinants of health and disease [56]. This is especially so for women, whose gender role, still linked with tradition for many, changes over time from that of a daughter to being a wife, then mother and finally, the grandmother. Gender violence expressed as symptomatic physical, verbal, or sexual assault, can prevent a smooth adaptation between the woman's various roles. These cause emotional distress [56,57], with an increased risk of progression to physical and mental illness.

The tendency towards wreaking gender violence, particularly if identified as a human failing earlier on in the perpetrator's life, can be addressed better if tackled early, as it represents modifiable behaviour that has not yet been engrained into the individual's personality. Thus, if recognised early and the concerned person has an insight into the problem with a genuine desire to overcome it, specific referrals can be sent to health professionals who can aid in modifying such behaviour. This is an important public health issue [58,59]. Domestic violence spans continents [60–63], has no geographical boundaries, and is not limited by race, ethnicity, social class, religion, or education. Sociocultural norms, with no deterrents for such odious behaviour, can help propagate domestic violence in certain communities where it is permissible. This reflects the diminutive regard that such a community holds for its female members. Awareness of emotional violence directed towards females by males has been discussed in much anthropological literature [64]. In medieval times, the dignity of women was upheld by chivalrous knights in Europe; this was also addressed by narratives from ancient epics such as the Mahabharata, where the male perpetrators of emotional and verbal violence were punished by other males who considered upholding the honour of the woman as righteous behaviour. Modifying prevalent sociocultural beliefs held by certain communities in order to prevent gender-related incidents that affect the health of females [65], and consequently places them in their rightful place in society, has remained a veritable challenge, worldwide. Violence has been experienced by women from different cultures [66] since antiquity.

Violence, in any society, is not perpetrated equally among members with cultural expressions of inequality, often addressed to women, children, [62,64–67], and the minority community. Current reports on refugees during wars, and also on displaced civilians [37], have documented violence against women besides a gender disparity in prevalence that could be associated with the relationships that they have with their partners/relatives, when displaced. An epidemiology report from 24 countries [68] mentioned that, although 40% of women participants had disclosed the gender-based violence to someone, only 7% made a formal complaint to the authorities, who accordingly documented an underestimate of the actual prevalence. Violence can affect any phase of a woman's life, from adolescence to the menopause [21,68,69], and interfere with the performance of her daily tasks. In health systems where there is a support structure for the necessary advice/counselling, and if the perpetrator feels remorse with a willingness to change such behaviour, violence could be sublimed to more creative outlets (music, drama, art or sport) of energetic expressions. Yet institutions where such management systems with specially trained staff are available, are limited.

Scoping clinical implications of gender-based violence

Gender-based violence has far-reaching consequences on the victim and her family. Domestic violence and sexual violence are two aspects of gender-based violence that can be inflicted separately or carried out simultaneously by the perpetrator. It can affect both the non-pregnant and the pregnant woman, her baby, and any siblings. Although the prevalence of domestic violence can be reduced during pregnancy or the pattern can change, it is reportedly common during

pregnancy, and 95% of women who have been previously abused are at increased risk [23], with 4.3% experiencing serious abuse. The actual prevalence of domestic violence is unknown, as it varies with the sample studied, and its under-reporting can range from 11-fold to 128-fold because women are afraid about reporting it [68]. Personal violence is carefully hidden, and can be self-generating across generations. Children whose mothers have been abused are most likely to be abused [70,71], with some children who are constantly exposed to violence concluding that this is acceptable behaviour. Estimates of domestic violence of 1–27.5% have been reported [71–73] in pregnant women, and it has reached epidemic proportions [74] in some samples.

The variegated presentations of domestic violence make diagnosis elusive, and sometimes clinicians are unaware of the possibility of it contributing towards the aetiology of not only the physical but also the psychosomatic manifestations in the affected patients. This under-recognition is more evident when the victim's complaints are not backed up by physical signs, and the traumatised woman is reluctant to confide in medical personnel whom she judges as being apathetic. The personal cost of non-recognition cannot be quantified and it has wide-ranging effects on children, many (40–71%) of whom may have witnessed the violence [74,75]. As attachment to a caring adult, generally the mother, usually makes the child resilient after witnessing such an event [75], the need for such understanding is paramount in reducing associated biopsychosocial morbidity in exposed children. Hence, early recognition of a psychosomatic element is helpful in formulating appropriate management, and limiting physical and/or emotional harm. If gender violence is managed effectively, economic benefits would accrue from reduction in the usage of medical, social, and legal services by the sufferer, and prevention of related adverse effects on any minors.

Disclosure and the obstetric/gynaecological impact of gender-based violence

Gender-based violence, whether persisting as domestic and/or sexual violence, is usually prevalent in communities that refuse to accept it as a problem. The reticence of victims in coming forward to seek help from the health and social services, if available, is due to several factors, including the fear that if the partner came to know of the disclosure, there would be reprisals by him. In certain ethnic groups, other family members may take revenge on the woman for sullying the family honour by reporting it. Cultural factors may also prevent the victim from accessing help, as she may have been brought up under the misconception that she is expected to live with violence. Conversely, she may be too embarrassed or ashamed of exposing the partner's behaviour, and fear social stigma. Gender violence can persist due to economic and emotional dependence of the victim on the perpetrator. When prevalent in middle–high-income countries, there is also an underlying fear that disclosure would mean that any children would be taken away for fostering. These are major factors, which discourage the woman from coming forward to access any available support services.

Furthermore, it is an under-recognised aetiological factor, not only in the pathogenesis of obstetric/gynaecological symptoms, but also in other forms of presentations such as with physical injuries that could be grievous. Gender violence in pregnancy is a risk factor for maternal deaths, and has contributed to the rise in the psychiatric causes that have preceded other indirect causes of maternal deaths in the UK [76], for the last four triennia. The detrimental effects of domestic violence on the pregnant woman's health may present clinically as symptoms of miscarriage, poor obstetric history, preterm labour, ruptured membranes, placental abruption, a small for gestational age or low birthweight fetus, and stillbirth. Other evidences of physical injury and associated sexual assault may also be evident. Psychological and behavioural manifestations can include: anxiety, depression, post-traumatic stress disorder, panic attacks, irritability, alcoholism,

substance misuse, insomnia, and other behavioural problems. It may also present as general symptoms of nausea, headaches, migraine, backache, nonspecific abdominal pain or irritable bowel syndrome, eating disorders, bruising, or fractures. It can interfere with bonding with the newborn, or there may be a developmental delay, and psychoemotional problems. The baby and other siblings may be abused by the violent partner, thereby losing their self-esteem, and becoming vulnerable to future abuse. This could have implications for reaching their developmental milestones and their personal/social relationships, with ill-health sometimes necessitating repeat hospitalisations. Additionally, complex humanitarian emergencies during natural disasters, and wars, affect the health of women and children [77], considerably.

The exact prevalence of rape or sexual violence is unknown but reports of 27.5% [59] from the UK, 19% (44% for other forms of violence) in US samples [56], and 31% in Latin America [24], have been reported. In addition, adolescents also referred to as the 'young key population' are at increased risk worldwide [78], and have very limited services to address their wide-ranging problems, along with barriers to access that include discrimination at the health system and policy levels. In Britain, the Sexual Offences Act 2003 [79] came into force on 1 May 2004, to strengthen the law on sexual offences, including non-consensual sex or rape, where 'consenting means that the person agrees to participate in sex by choice, and has the freedom and capacity to make that choice'. The aim of the Act is to implement preventative measures, and widen the scope of protection of individuals, including children, from assault by those who are sexual offenders. Rape is an extreme form of gender-based violence reflecting the power imbalance between men and women in various cultures, and during armed conflicts. The symptomatic sequelae from intimate partner violence add to substantial costs at first for immediate treatment [80], and later for expenses that arise from further utilisation of healthcare services by the victim. It has been recognised as a Human Rights issue by the United Nations since 2006, and can be associated with female genital mutilation (FGM), which is another issue related to Human rights.

FGM [81,82] or female genital cutting (FGC), affects more than 125 million girls and women worldwide with >90% having undergone the procedure in countries [83] that promote it as a necessary cultural/religious ritual. Migration has brought women who have undergone FGM to Europe, North America, and Australasia along with the occasional circumciser who has also arrived together with the migrants/refugees. The circumscriber may practise FGM clandestinely. FGM is customarily practised in Africa (30 countries), a substantial part of the Middle-East [84], and to a lesser degree in parts of Asia; also in Columbia and Peru, notably among members of the Muslim community. Where practised, the populace is led to believe that it is a part of religiosity. Islamic scholars [85] however, have discounted this and stated that there is nothing in their religious teachings to support this practise. Despite having long-standing health repercussions, FGM continues to be promoted as a 'girl's rite of passage to womanhood' [86], so there is cultural support where circumcision is prevalent. It persists [86–91] as the relevant communities endorse it in order to make the girl/woman 'qualified' for marriage and childbearing. Hence, those attempting to change cultural practice face resistance, despite regulations/guidelines to stop FGM [87–94]. It is carried out often when the female child is under 5 years of age but this type of mutilation can extend into the teenage years, usually up to 15 years of age. In the UK, it is estimated that 137 000 females have undergone FGM at their country of origin [95], with 10 000 being under 15 years of age.

It is graded into types, with an ascending severity that corresponds to increasing involvement of the female external genital tissues with type 3 (infibulation) being the most severe form; the incision can extend to affect the urethral meatus and the adjacent urethra, besides adjacent areas of the groin and the thighs. The gradation into types, as classified by the WHO [81,83] are:

Type 1: Partial or total removal of the clitoris and/or the prepuce (clitoridectomy).
Type 2: Partial or total removal of the clitoris and the labia minora, with or without excision of the labia majora.
Type 3: Narrowing of the vaginal orifice with creation of a covering seal by cutting and appositioning the labia minora and/or the labia majora, with or without excision of the clitoris (infibulation).
Type 4: All other harmful procedures to the female genitalia for non-medical purposes, e.g. pricking, piercing, incising, scraping, and cauterisation.

Type 3 is exclusively practised in African countries and leads to the most harm, although type 2 can also be harmful, as can type 1 if collateral damage of tissues leads to excessive bleeding, and later a stenosed vagina and/or urethra, along with the psychosocial effects of anatomical damage of these structures in addition to their malfunction.

FGM is a painful, mutilating procedure usually carried out without formal consent or adequate anaesthesia by the non-medical practitioners who perform a large proportion, and continue to remain its advocates. It can lead to haemorrhage, infections, and fibrosis of the introitus, with difficulty in the flow of menstrual blood and/or in passing urine. Severe physical mutilation is particularly relevant to type 3, where a tiny hole may be left thereby obstructing both micturition and menstruation, and increasing the risk of infections due to back-flow of collected urine or blood. FGM can be fatal at surgery or later, due to haemorrhage, trauma to adjacent tissues, tetanus, septicaemia, repeated infections or abscesses, and infertility. Complications from the procedure in 50% of girls has been reported from Somalia [96]; the lower limbs are bound for 2–6 weeks following the procedure to stem the haemorrhage and facilitate healing but it can lead to further physical and mental ill-health. When in a relationship, sexual intercourse may be difficult. It is commonly compromised in Type 3, with the male partner carrying out the de-infibulation or seeking the circumciser's help for it prior to having intercourse when they decide to father children.

Cultural competency in health professionals regarding FGM could facilitate its management. Specific care has to be given antenatally [94–97] and in labour according to the type of FGM. De-infibulation can be carried out as an interval procedure when non-pregnant or until the second trimester when pregnant [95], at delivery or postnatally. Moreover, when teenagers/adults with FGM labour in their country of origin, prolonged labour due to obstruction in vaginal birth can result in vesico-vaginal fistulae [98].

Domestic violence can be associated with FGM [99], thereby raising further physical and psychosocial issues, as both aspects can bring about multifaceted problems, including safe-guarding concerns. FGM is illegal in the UK [100,101] and a few other European countries. There are also legal deterrents for a repeat FGM in the UK. However, when the girl/woman living in the West visits her country of origin after getting de-infibulation, FGM can be carried out again by circumcisers against the girl/woman's wishes during their visit; this would potentially need de-infibulation on their return back to their adopted country. Despite legislation to stop FGM, which includes a global ban by the United Nations in 2012 [93], it continues to be practised, as elders in the concerned societies appear to condone it, with traditional circumcisers and birth attendants being largely involved in performing, and promoting it. It is carried out covertly by unregulated health practitioners even in the West. There is under-reporting of FGM, even in those developed countries who have declared it as illegal. Its biopsychosocial effects are under-recognised along with its effects on the male partner, who could have penile wounds/infections with a potential for further harm [102], though reported evidence is scarce. Young men from a few of these communities have started questioning the practise of FGM so further partner/community involvement could help [103] in preventing FGM along with the procedure-related physical scarring, and the resultant psychosocial harm.

Gender-related issues in generating psychosomatic disease with healthcare needs

Table 12.1 illustrates the impact on healthcare systems of obstetric presentations due to psychosomatic interactions following gender violence. The tabular depictions are subdivided to elucidate the presentation, management, aetiology, and impact.

Table 12.1 Clinical vignettes showing the impact on healthcare systems of managing obstetric presentations with psychosomatic repercussions of gender violence

	Vignette 1: Obstetrics—International migrant (refugee), communicated via interpreter as she could not speak/ understand English	**Vignette 2: Obstetrics—British Caucasian, who migrated with parents to another region of the same country (economic migrant), communicated well**
Presentation and management	*Ms FB, a 20-year-old nulliparous, single, unemployed West African refugee, who requested a female doctor for her assessments came to book her first pregnancy* ◆ Ms FB's fetal movements were good, and she did not have any complaints ◆ She did not have an early dating scan, the first assessment with an U/SS was at 36 weeks when a singleton was confirmed; the growth scan, liquor volume and Doppler studies suggested a small for dates fetus that was functionally uncompromised ◆ The first antenatal clinic visit was at 37 weeks when a type 1 FGM was noted; she declined any treatment for it even after delivery; her assessment indicted that she could deliver vaginally; an episiotomy would be performed at delivery, if indicated ◆ She was admitted at 38 weeks with complaints of headaches, blurred vision, appetite loss, sleeplessness, and feeling unwell ◆ She had a mask-like, expressionless face, a BP of 154/96 mmHg, minimal pedal oedema, and no proteinuria ◆ The results of her fundoscopy were normal, bilateral limb reflexes were normal, and there was no ankle clonus ◆ A neat, non-tender abdomen with a longitudinal lie, cephalic presentation, and a fetal heart rate within the normal range was confirmed	*Miss MM, a 19-year-old para 1, single unemployed, Caucasian, cohabited with her partner* ◆ Miss MM smoked 10 cigarettes daily, and occasionally binged on alcohol ◆ She was hospitalised at 6 weeks' gestation because of abdominal pain and a suspected ectopic pregnancy; an ultrasound scan confirmed a single intrauterine pregnancy; the pain subsided and she was discharged ◆ She had six admissions since 24 weeks' gestation for abdominal pain and reduced fetal movements; maternal and fetal monitoring and observations at each visit confirmed a normally progressing pregnancy ◆ At each admission she appeared anxious and fearful, and resisted returning home by complaining of abdominal pain whenever she was considered fit for discharge ◆ Screening questions confirmed dysphoric symptoms, and midwifery support that included active listening was arranged ◆ She confided to the MW about her current partner as being 'unpredictable', and violent at times; he could be dissatisfied with the attention she gave him ◆ The Tribunal called out ruled State protection (SP) for the unborn fetus, as it appeared that she would be unable to shield the baby from harm if her partner turned violent

Table 12.1 Continued

	Vignette 1: Obstetrics—International migrant (refugee), communicated via interpreter as she could not speak/ understand English	**Vignette 2: Obstetrics—British Caucasian, who migrated with parents to another region of the same country (economic migrant), communicated well**
	◆ Feto–maternal surveillance for her pregnancy induced hypertension (PIH) was started; labour was induced because of severe hypertension that did not respond to antihypertensives ◆ She delivered normally a live, male baby weighing 2650 g ◆ She was discharged on the third day of her puerperium to the community MW's care, with social worker tracking	◆ She had a normal delivery of a live female baby who weighed 3150 g; the baby was to be bottle-fed and was transferred for SP as planned after feeding was established ◆ Counselling and then antidepressants were prescribed for Miss MM after the baby was transferred for SP ◆ Her puerperium seemed to be progressing normally, and she was discharged soon after on her medication ◆ Visiting rights to see her baby would be considered at a future date after a review of her intentions, and ability to parent, with/without her partner
Psychosocial factors increasing vulnerability to psychosomatic disease	◆ Ms FB had missed a period when she experienced the biopsychosocial trauma of physical, and sexual assault by soldiers who killed her husband, a political activist, in Africa ◆ She fled Africa with the help of the Red Cross, and received paternal monetary support to settle in a new country ◆ She had a concealed pregnancy until 36 weeks' gestation ◆ She was a late transfer to a tertiary hospital where she delivered ◆ She was living with acquaintances; had an ineffective social network, and was very worried about her baby and their future ◆ She was re-experiencing the violence in nightmares ◆ She probably had post-traumatic stress disorder with mood symptoms requiring evaluation	◆ Miss MM gave a history of assault by her step-father for seven years ◆ At 16 years of age she was hospitalised for an overdose of paracetamol with suicide intent ◆ She was screened for depression but not treated or followed up when she migrated from one nation to another with a different healthcare structure ◆ She ran away from home in the North to settle in the South of England ◆ The move disrupted her social network ◆ Her current partner was abusive but she found it difficult to leave him ◆ She had vivid and sad memories of her first baby, who was born normally two years before; he was taken away for SP as it was felt that she and her partner would not be able to provide appropriate parenting ◆ She feared for this second baby's welfare, and was anxious when pregnant that this baby would be taken away for SP too; it happened as she had pre-empted and affected her emotionally

(*continued*)

Table 12.1 Continued

	Vignette 1: Obstetrics—International migrant (refugee), communicated via interpreter as she could not speak/ understand English	**Vignette 2: Obstetrics—British Caucasian, who migrated with parents to another region of the same country (economic migrant), communicated well**
Impact on the healthcare system	◆ Ms FB was unfamiliar with British healthcare or the English language, and needed an interpreter; this added to healthcare costs ◆ Late booking limited prevention and identification of health risks ◆ Her behaviour indicated fear and anxiety, which can increase the risk of future psychosomatic disease, and may require further support with incurring costs for healthcare provision	◆ Miss MM had repeated antenatal admissions for assessments, despite negative findings at each visit; this increased healthcare costs ◆ The impact on the mother and the baby of the separation at birth would need monitoring, and add further to the ongoing healthcare expenses for both ◆ Any biopsychosocial intervention would be an additional cost to the healthcare providers
Other forms of presentations and behaviour	◆ Overt presentations of unexplainable physical abuse, e.g. bruises, fractures, behavioural problems, no set pattern, anxiety, depression, post-traumatic stress and substance misuse ◆ Symptoms of STIs, such as herpes, HIV, or hepatitis ◆ Late booking with frequent non-attendances ◆ Aversion to vaginal assessments ◆ Request for stronger analgesia when in labour and even prior to its onset ◆ Repeated self-referrals requiring out/inpatient hospital assessments or attending primary care with minor injuries or psychological symptoms ◆ Refusal of offers for medical or social intervention ◆ Symptoms may go unrecognised by health professionals ◆ The partner may be over-protective or over-involved if accompanying her ◆ Risk of tokophobia in future pregnancies ◆ Requesting an elective caesarean when classified as a low-risk pregnancy, that could end in a normal vaginal birth	

Learning points

Both Ms FB and Miss MM were exposed to violence before reaching adulthood. Ms FB experienced FGM as a child but, being the daughter of an esteemed elder in her community, may have helped her in getting a less severe type of FGM [83] with less severe biopsychosocial effects; its effects on the delivery was minimal. She seemed happy and appeared to care for her baby although unsure of her future; she did not reside with a violent partner, and seemed to be overcoming her rape-trauma syndrome. Ms FB requested and was allowed to keep the baby, which would help with the emotional healing process. However, she would be under close surveillance. Miss MM's childhood experience of the violence perpetrated by her stepfather whom she had trusted initially made her timid, and wary of adults. She also developed a docile personality, which was taken advantage of by her aggressive partner. She was unable to guarantee protection for her baby, so state protection (SP) had to be provided, as safeguarding issues could not be excluded when assessing Miss MM's personal situation.

Sample characteristics of hospital catchment areas and impact on healthcare The obstetric clinical vignette 1 (Table 12.1) was selected from a teaching (tertiary) hospital with a catchment population that included lower middle-class migrant subgroups from Africa, Eastern Europe, and Asia, as well as local British Caucasian citizens. It has an annual delivery rate of 6000. Ms FB, who needed patient-centred care, is representative of a sample of anxious pregnant women, who attended the hospital between 9.00 p.m. and 1.00 a.m. daily. They often overwhelmed the overnight healthcare arrangements, dealing with emergency admissions because of various pregnancy symptoms (abdominal pain, leaking liquor, reduced fetal movements, vague aches, etc.); the symptoms were not necessarily confirmed by signs. Women who attended at night were reluctant to go home. The behaviour of these night attendees was often suggestive of those who have experienced gender violence but despite assurances about confidentiality, they very rarely disclosed this. Disclosure could occur when the partner had left the hospital, as these women were afraid of repercussions and insisted on confidentiality; they could face worse violence or abandonment if the partner knew of their disclosure. Most women needed overnight admissions for feto–maternal assessments. Ms FB was not being exposed to violence by being safeguarded when she entered the UK as a refugee, and she remained in this status during her puerperium.

Obstetric vignette 2 (Table 12.1) was selected from an ongoing audit at a tertiary hospital with an annual delivery rate of 5500, and a largely non-mobile, urban/rural, upper middle-class Caucasian population. It is representative of a depressed (11%) pregnant sample who were exposed to domestic violence (6%), and needed counselling or/and antidepressive medication. Miss MM had to consent for SP but it could be withdrawn later and visiting/maternal rights given her.

Table 12.2 exemplifies sexual assault as an aetiological factor in generating psychosomatic gynaecological manifestations.

Table 12.2 Vignettes (3 & 4) illustrate the impact of sexual assault in generating psychosomatic gynaecological manifestations

	Vignette 3: Gynaecology—An acute emergency admission	**Vignette 4: Gynaecology—A non-emergency gynaecological referral**
Presentation and management	*Miss BO, a 19-year-old British Caucasian* ◆ Miss BO was admitted via the A&E Department with pelvic pain ◆ Her general observations were stable; she was non-pregnant, and transferred to the gynaecological ward ◆ She was underweight with a soft abdomen, and slight tenderness in the suprapubic area ◆ She refused pelvic examination, and analgesia ◆ She was discharged home the next day ◆ She was readmitted with pain as an acute abdomen ◆ She was laparoscoped, and found to have a normal pelvis/abdomen	*Mrs JC, a 37-year-old East-European Caucasian, teacher's assistant, was married to a third partner two years back* ◆ Mrs JC was referred by her general practitioner (GP) because of infrequent intercourse (× 4 times in the last two years) and dyspareunia ◆ She avoided intercourse 'unless tipsy' ◆ She refused routine cervical smears after the first one in her mid-20s ◆ She consented to an examination after a detailed explanation; she underwent a pelvic examination with a lubricated speculum used for nulliparae ◆ She mentioned that her husband felt rejection as she got annoyed at his sexual advances, but was faithful to her

(*continued*)

Table 12.2 Continued

	Vignette 3: Gynaecology—An acute emergency admission	Vignette 4: Gynaecology—A non-emergency gynaecological referral
Psychosocial initiating and maintaining factors	◆ Miss BO left home at 16 as she felt her parents 'put her down', and would 'whack her' for 'no reason' ◆ She had worked as an administrative assistant, and left the job to be with her current partner ◆ She suffered repeated physical and sexual assaults by her partner when he returned from work ◆ She was vulnerable because of low self-esteem, loneliness, and economic dependence on her abusive partner ◆ She appeared very anxious, and frightened	◆ Mrs JC, at consultation, disclosed for the first time about her teenage experience of sexual assaults by a religious leader ◆ Her parents had migrated from Europe; a timid child, she respected elders ◆ She did not confide in anyone as she was afraid that the perpetrator would hurt her or her family; he lived in the same street ◆ She had nightmares about it, and panicked ◆ Her lack of trust of other males prevented steady relationships ◆ Complex thoughts generated psychosomatic disease; she abhorred sex, and experienced dyspareunia/apareunia
Impact on the healthcare system	◆ Miss BO accepted intervention by a social worker who arranged transfer to a 'shelter home' ◆ She moved to an undisclosed location for long-term support and counselling while she built up her life again ◆ Additional costs for health and social care provision were added	◆ Counselling for rape was started; she kept all appointments to be 'fair' to her husband. ◆ Psychosexual support to improve Mrs JC's sexual relationship would be started after rape counselling reduced her abhorrence of sex ◆ Supportive healthcare would be prolonged with additional costs
Other forms of presentations and behaviour	◆ Overt presentations of physical abuse, menstrual problems, vaginal discharge, unwanted pregnancy, anxiety, post-traumatic stress disorder, depression, symptoms of sexually transmitted infections, such as hepatitis, syphilis and/or HIV ◆ Repeated assessments and investigations could be negative ◆ Symptoms of miscarriage, sexual problems, infections, and infertility ◆ May hide facts or refuse social intervention ◆ Unusual problems, such as a vaginal fistula following sexual assault with objects ◆ Inpatient admissions for long periods with vague complaints ◆ Could go unrecognised, as the patient is reluctant to confide ◆ Partner may appear concerned, over-protective, or unconcerned ◆ If pregnant, may request a termination despite emotional sequelae	

Learning points

Miss BO had faced assault as a child and developed into a timorous personality who was vulnerable to future assaults. It is reported that the mother can protect a child from assault [75] at home. However, sometimes both parents can collude in violence directed at the child; the child may then decide to leave home while still yearning for affection. This can lead to rash decisions such as selecting a partner who appears to be supportive but is later found to have a personality similar to her violent father. Miss BO began perceiving symptoms created by her emotional triggers, but no diagnosis was confirmed after medical examinations and investigations. Her discussions with the psychosomatic-oriented physician persuaded her to seek social worker support for moving to a 'safe haven'. Mrs JC had faced sexual violence as a teenager with psychosomatic sequelae and developed apareunia when trying for steady relationships. Reticence due to social constraints

prevented help-seeking until adulthood. The psychosomatic approach in the consultation made her seek help to overcome her apprehensions about coitus.

Sample characteristics of hospital catchment areas and impact on healthcare The gynaecological vignettes 3 and 4 depicted in Table 12.2 were selected from presentations at a hospital in a large township. The catchment population for the hospital belonged mainly to the middle-class and were of Caucasian ethnicity. It was a stable population with most having stayed there for generations. Patients who visited the hospital seemed relatively well-off, and maintained a culture that respected privacy, and tolerance. They could 'take a lot' with a 'stiff upper lip' before discussing personal problems. Hence, many would live with their biopsychosocial problems, and even avoid hospital consultations. Managing patients is facilitated if the attending professionals understand the aetiology behind their patients' presenting symptoms by using a psychosomatic approach in their assessments. Individualised case-finding has been recommended as a method of detection for domestic violence rather than universal screening [104] until more supportive evidence to apply the latter method is available; this would prevent the harm from hastily using tools that can over-diagnose, thereby resulting in false-positive cases.

Although domestic and sexual violence are widely prevalent and preventable, and their health repercussions are known, the familial/social hierarchy may be unable to prevent it entirely, even with built-in social and legal deterrents. Vignette 5 (Table 12.3) is an illustration of this.

Table 12.3 depicts the hospitalisation and prolonged after-care for a life-threatening morbidity, in the daughter of an economic migrant. The county hospital was in a small, picturesque town in an area of natural beauty that attracted tourists. The family of the patient had moved there six months before the incident.

Table 12.3 Vignette illustrating a life-threatening emergency admission with psychosomatic sequela

	Vignette 5: Assaulted British teenager with severe injuries and psychosomatic sequelae
Presentation and management	*Miss MC, a 15-year-old British Caucasian schoolgirl, when out with a 36-year-old Caucasian acquaintance, was sexually assaulted by him under threat of physical harm; she was distraught, and unclear about the sequence* ◆ She presented as an emergency admission who came via ambulance (a 999 call) at night ◆ She complained of sudden, excessive vaginal bleeding, vulvovaginal, and abdominal pain, and faintness; she had pallor, hypotension, and tachycardia with a thready pulse. Urgent procedures for acute hypovolaemia were instituted and a call sent for an anaesthetist, a second gynaecologist, and a junior resident ◆ Intravenous infusion, a blood cross-match, relevant investigations and antibiotics were started; her BP plummeted repeatedly despite infusions of O Rh –ve blood ◆ She was in severe pain so was consented for appropriate operative procedures (including major uterine surgery) in theatre; she had an examination under anaesthetic with good visualisation ◆ Bruises over her vulva and right thigh were noted, along with two labial lacerations, which were actively bleeding, besides excessive blood loss from a lacerated left vaginal fornix, and the adjacent cervix. Repair of lacerations and insertion of haemostatic sutures were carried out using a combined abdomino-vaginal approach. Forensic samples had been taken, and an intravaginal pack was left *in situ* to be removed after 24 h ◆ Postoperatively, when Miss MC awakened she received analgesia, emergency hormonal contraception, and antibiotics; an explanation about her management was given ◆ She was discharged on the fourth postoperative day after arranging for ongoing counselling, and a follow-up

(*continued*)

Table 12.3 Continued

	Vignette 5: Assaulted British teenager with severe injuries and psychosomatic sequelae
Biopsychosocial impact and continuing psychosomatic symptoms	◆ Initially, Miss MC's parents who accompanied her wanted her to be discharged soon after the operation because of fear that their neighbours, and her school contacts would come to know of the physical and sexual assault, if she was an inpatient. After detailed explanations, they understood the seriousness of her condition, and that she could have exsanguinated or lost her womb if the surgical procedure did not stop the bleeding. They were economic migrants who wanted respect from their neighbours and the new community that they had moved into. *At the two-month follow-up* ◆ Miss MC disclosed how the perpetrator subjugated her to violence. He had used an empty wine bottle to threaten, and bruise her as she did not consent to have sex and the 'sniff' ◆ After the hospital discharge, she had continued to need sedation for disturbed sleep, with repeated nightmares, and was initially terrified of another assault by him ◆ She could not relax and was hypervigilant ◆ She could not use a tampon, as was her practice, during her only menstrual period since the incidence ◆ Although the wound had healed, the vulva was tender so sanitary protection had been painful *At six months after the incident* ◆ Miss MC still had intermittent vaginal and vulval pain, the vulva remained slightly tender, and she had been unable to use tampons ◆ She consented to the examination, which confirmed a healthy vaginal vault ◆ No additional treatment was advised ◆ Her sleep was disturbed with occasional nightmares ◆ Her schooling, social networking, and leisure activities suffered ◆ In accordance with her request, she was discharged from hospital care to her local GP's care as this was more convenient for her *At 14 months after the incident* ◆ The case came to court and Miss MC collapsed during the cross-examination; her statement, the medical evidence, and the forensic report convicted the perpetrator ◆ Complex thoughts evolved to generate fear, anxiety, and post-traumatic stress disorder in Miss MC ◆ She complained of intermittent vaginal and vulval pain; she could not bear to use tampons although the lacerations had healed ◆ She could not think of having a future relationship, and refused to go out with any male acquaintances ◆ At 16 months after the incident she started back to school
Impact on the healthcare system	◆ Initially, Miss MC accepted sedation prescribed by her GP but declined counselling saying that she had enough family support, and was uninterested in any relationships; she accepted psychological intervention after three months of the incident ◆ Long-term counselling, and additional support with relationships was pre-empted because of her psychosomatic problems, and continuing low self-esteem; these would add to healthcare costs ◆ Her mother became very anxious, feared for Miss MC and had sleeplessness so also needed the GP's attention including an occasional hypnotic prescription—an additional expenditure

Learning points

The clinical scenario of Miss MC, a teenager, has been presented to create awareness of life-threatening morbidity after a single exposure to physical and sexual violence. A date rape [105] had been planned by the perpetrator—her new 'friend'. He became impatient and violent when she would not take 'sniffs' of cocaine or allow him to have sexual intercourse. At admission, urgent treatment included repeated transfusions to prevent exsanguination from the continuing blood loss due to trauma inflicted on the descending cervical branch of the uterine artery. Again, immediate expert surgical help was needed for repair, both abdominally and vaginally, to stop the bleeding. The assault caused intense fear (see Chapter 1) and progressed to physical, mental, and social ill-health. Miss MC was naive in trusting her new friend but appropriate prolonged psychosomatic healthcare provision at the hospital/clinics and the conviction of the perpetrator by the judiciary helped with her recovery.

As cocaine use has been discussed in Chapter 4, it suffices here to say that it is an addictive drug, particularly if introduced to a subject when she is despondent. It is known to be used by women who have experienced sexual assault [106], particularly in their adolescence; a life-long dependence develops. Miss MC was principled, and resisted overtures from the friend who had planned assault. Good communication with supportive parents, and counselling could prevent any future tendency towards errant behaviour.

Sample characteristics of hospital catchment areas and impact on healthcare: The hospital was in a shire town with historical connections to medieval times. It attracted tourists. It benefited from visitors but the residents maintained relative community/family values that had lasted generations; it ran on trust. However, occasionally human 'predators' can reside in such areas, and inflict unexpected violence. The family of Miss MC had emigrated from a quiet village, so were strangers to the town, and less familiar with the inhabitants' lifestyles. The county hospital prided itself in providing all hospital services, from the basic to the specialised, for those residing in the surrounding large rural area; the clinical acumen of the doctors/staff employed there was remarkable. Although the annual delivery rate was 2500, all aspects of obstetric and gynaecological healthcare were provided assiduously. It benefited the local population, as the tertiary hospital was further away and the terrain made transportation of a patient difficult, particularly during the winter.

Termination of pregnancy and sociocultural factors

Termination of pregnancy or abortion is legally carried out in the UK for up to 23 completed weeks and 6 days. Both medical and surgical methods are used, with the former method being licensed for early abortion (up to 13 weeks' gestation) in 1991, and subsequently for late abortion. The medical method uses mifepristone, an antiprogestogen, which results in a complete abortion in approximately 60% of women. If used along with a prostaglandin [107], the complete abortion rate is increased to over 95%. Surgical termination can be carried out by manual vacuum aspiration as an option when the pregnancy is under seven weeks but this is usually not encouraged. The other method of surgical termination is carried out by dilatation of a cervix already primed with prostaglandin. Evacuation of the uterine contents is next carried out under a local/general anaesthetic. Although both methods are highly effective, surgical evacuation may ultimately have to be carried out if the medical procedure does not end in a complete emptying of the uterus. While haemorrhage and infection are known risks for both procedures,

the surgical method is more definitive, with only one visit for the patient. During the surgical procedure there are additional risks of uterine perforation or cervical damage with the latter resulting in cervical incompetence in a future pregnancy. These complications can be avoided by well-trained gynaecologists, and the priming of the cervix with pharmacological cervical dilators beforehand. Pre-/post-termination counselling is available in many healthcare facilities and includes contraceptive advice to prevent unplanned conceptions in the future, besides advice on family spacing when intending to start a family.

According to the WHO, although deaths from abortions have declined overall, the percentage from illegal abortions has persisted, and this mainly involves under-resourced countries. Illegal abortions can be unsafe. An abortion is considered to be unsafe when a procedure for terminating an unwanted pregnancy is undertaken by a person/s lacking the necessary skills, or is carried out in an environment lacking the minimal medical standards, or both. The MDG3 was to have addressed this problem but targets in some countries never reached this goal. There is a variation in the legal framework relating to abortions from country to country, and this can be an important factor in those trying to access abortion services. It is widely known that in countries such as South Africa, Peru, certain regions in Europe, and in the USA, the reluctance to provide/access legalised abortion services persists. This promotes recourse to expensive medical tourism or unsafe practices related to abortion that can have high morbidity, and may be fatal.

Sociocultural, and religious factors can influence lack of uptake of relevant legalised contraception/family planning services thus preventing optimal outcomes. This leads to unwanted pregnancies or complications, including fatalities, from septic abortion. There is WHO data [108], which reports that 21.6 million unsafe abortions took place worldwide in 2008, almost all in developing countries. This was an increase from the previous figure of 19.7 million in 2003, and was at a rate of 14 unsafe abortions per 1000 women aged 15–44 years. Some countries have become committed, e.g. Bangladesh, took a proactive stance by enacting legislature to prevent illegal abortions; this reduced their incidence of illegal abortions during the last decade, and prevented potential morbidity with fatalities.

Table 12.4 regarding termination of pregnancy (abortion) resulting from conceptions following sexual assaults demonstrates the impact of sociocultural factors in modulating access to planned appropriate care, which resulted in contrasting outcomes.

Table 12.4 Vignettes illustrating the impact of sociocultural factors in modulating access to care regarding termination of pregnancy following sexual assault

	Vignette 6: Gynaecology—Routine hospital admission in a large British city	**Vignette 7: Gynaecology—Emergency hospital admission in a small Indian town**
Presentation and management	*Miss BC, a 16-year-old unmarried primigravida, with an amenorrhoea of 11 weeks presented for a termination of pregnancy (abortion)* ◆ Miss BC left home after a quarrel with her mother and was staying at a female friend's flat where she was sexually assaulted by a 'male friend' and two of his accomplices, and got pregnant	*Miss AI, a 19-year-old unmarried primigravida, with an amenorrhoea of 12 weeks presented as a hospital emergency* ◆ Miss AI mumbled about being 'assaulted' by a relative, and about 'cleaning' her uterus ◆ She became moribund soon, and haematological tests confirmed a septicaemia with a preliminary report indicating Gram-negative faecal flora infection

Table 12.4 Continued

	Vignette 6: Gynaecology—Routine hospital admission in a large British city	**Vignette 7: Gynaecology—Emergency hospital admission in a small Indian town**
	◆ On hospitalisation, she received routine clerking, and underwent relevant investigations including screening for STIs ◆ She consented to a termination but was extremely upset and needed an extended consultation as she had been in a dilemma about the abortion ◆ She was started on antibiotics and the uterus evacuated as a day surgical procedure, which she had opted for ◆ Her blood group was Rhesus –ve, so the appropriate dose of anti-D injection was given ◆ She was discharged following the abortion with contraceptive advice and a follow-up appointment was given for two weeks after her discharge ◆ Her parents accompanied her and were upset but supportive and sensitive to her needs whether in hospital or at home	◆ She was started on parenteral triple antibiotics but the pyrexia was not responding to it; she appeared moribund ◆ Abdominally there was a persisting peritonitis, and scant bowel sounds; nasogastric suctioning brought out bile-stained fluid ◆ A U/SS revealed an empty uterus with a collection in the pouch of Douglas ◆ Hence, a decision was taken to carry out a laparotomy, and proceed surgically as indicated; surgical drainage of purulent abdominal fluid and a repair of a uterine fundal tear was carried out ◆ Postoperatively she was kept under intensive care but succumbed to a septic embolus, despite heroic medical efforts ◆ Her relatives seemed relieved rather than concerned; they commented insensitively to the healthcare personnel treating her that the 'Almighty' had punished her for her sins ◆ After a post-mortem, the body was returned to the relatives for her last rites
Similarities in psychosocial factors increasing vulnerability to psychosomatic disease	◆ Both were vulnerable teenagers ◆ Both had been forced to participate in unprotected non-consensual sex ◆ Both could not access emergency contraception ◆ Both were at risk of acquiring STIs ◆ Both had an unplanned conception and were traumatised ◆ Both did not confide in supportive confidantes ◆ Both underwent a surgical abortion at 11–12 weeks ◆ Socioeconomically, both belonged to the middle-class ◆ In both cases, the male perpetrators were not involved in their hospital care	
Dissimilarities in psychosocial factors	◆ Miss BC had been assaulted by an acquaintance, whereas Miss AI had faced incest ◆ Miss BC belonged to a community/faith, which did not forbid abortion, whereas Miss AI belonged to a community/faith which did ◆ Miss BC's parents arranged the abortion through her GP but Miss AI's father and brother arranged for a non-registered practitioner to carry out the procedure at a private location, and not at a private hospital or the local government hospital ◆ Miss BC's parents were very supportive and availed of the legal abortion and aftercare but Miss AI's father and brother arranged for an illegal abortion, and seemed aloof with little sympathy towards Miss AI's predicament ◆ There was an opportunity for Miss BC to discuss with health professionals about her decision for abortion but Miss AI was unable to do so as the elder males in the family had decided for her; later she was too ill to convey her wishes	

(*continued*)

Table 12.4 Continued

	Vignette 6: Gynaecology—Routine hospital admission in a large British city	Vignette 7: Gynaecology—Emergency hospital admission in a small Indian town
Impact on the healthcare system	◆ Miss BC had appropriate care for her legalised abortion with adequate support, and could access counselling for as long as required ◆ The healthcare system would bear the costs	◆ Miss AI was managed outside the legalised healthcare system so the only cost to the health service was when she was admitted as an emergency ◆ The septic abortion, and uterine perforation with septicaemia was fatal

Learning points

Vignettes 6 and 7 (Table 12.4), depict the physical and mental plight of pregnant teenagers from different countries who had been impregnated through assault. The influence of sociocultural and religious factors in the decision-making for females with unwanted pregnancies wanting termination are compared in Table 12.4. Emergency contraceptive services, although available locally were not accessed initially by the teenagers, as they were afraid that this would mean confiding in a family member; these victims were not ready to do so for fear of repercussions from their families. Hospital care has to be tailored to the individual users and often, psychosociocultural aspects need to be considered in formulating healthcare. Over the years, the views of service users have gained importance, and this has been possible in the UK, where health education has been promoted among the literate clientele. This was taken into consideration for Miss BC's management and although she was distressed, an optimal outcome was obtained. Miss AI unfortunately was brought too late for appropriate hospital care. She succumbed to infection acquired at the unlicensed healthcare facility. Besides lacking health education, her family represented archaic/partisan views about the woman's place in society; the responsibility for impregnation lay squarely on the assaulted victim. Awareness of emergency contraception to avoid having to terminate a pregnancy, needs more publicity to be acceptable by communities, and prevent future morbidity or fatalities.

Sample characteristics of hospital catchment areas and impact on healthcare The gynaecological vignettes 6 and 7 depicted in Table 12.4 were selected from presentations at hospitals in large cities from the UK and India, with 25% of the catchment population being mobile. In the UK, it was a NHS teaching hospital which served both middle- and working-class populations (equally proportioned) composed of Caucasian ethnicity (70%) and ethnic minorities (30%). In India, the catchment population was 90% of South Asian origin, Caucasian (1%) and 10% of mixed ethnicity, with the hospital being a teaching hospital. Both hospitals provided all patient services free at source but the type of care provision was biopsychosocially tailored in the UK, which facilitated appropriate care for the termination. The differences in the vignettes highlighted in Table 12.4 indicate how earlier appropriate management gave a better prognosis for Miss BC.

The vignettes discussed in this chapter confirm that gender violence has no boundaries of social class, race, ethnicity, or religion, and may have symptomatic psychosomatic effects requiring attention. Reluctance or evasiveness to questioning at history-taking or the constant presence of a domineering partner should also raise suspicion. Repeated medical assessments may be needed to attend to symptomatic women who make excessive demands on healthcare provision because of the physical and mental diseases resulting from gender-based violence sometimes without

supporting signs. When examining the patient, medical staff who are uncomfortable in dealing with such problems, would benefit from developing psychosomatic skills.

Termination of pregnancy and emergency contraception

The last death from illegal abortion (termination of pregnancy) in the UK was in 1982. Termination of pregnancy in the UK was legalised in 1967, and illegal abortions have disappeared in its wake. The Abortion Act [109] states that two registered medical practitioners have to agree in good faith as follows:

'(a) that the pregnancy has not exceeded its 24 weeks and that the continuance of the pregnancy would involve risk, greater than if the pregnancy were terminated, of injury to the physical or mental health of the pregnant woman or any existing children of her family; or
(b) that the termination is necessary to prevent grave permanent injury to the physical or mental health of the pregnant woman; or
(c) that the continuance of the pregnancy would involve risk to the life of the pregnant woman, greater than if the pregnancy were terminated; or
(d) that there is a substantial risk that if the child were born it would suffer from such physical or mental abnormalities as to be seriously handicapped.'

Termination of pregnancy was legalised in India in 1971 [110] but illegal abortions continue and mainly involve less educated women in rural areas, or the socioeconomically underprivileged. Globally, there are roughly 4700 maternal deaths per year from unsafe abortions, which represent 13% of maternal deaths. Of the 21.6 million unsafe abortions per year, 98% are in low-income countries [111–113]. This represents 218/100 000 deaths in low income countries, whereas in the USA, it is 0.7/100 000. Around 22 million women undergo unsafe abortions [113] and a major proportion of these (3.2 million) are undergone by teenagers (15–19-year-old girls). Deaths due to mid-trimester abortions are 30 times higher [114] than if the abortion is carried out at eight weeks. These factors should be taken into account in the prevention of unwanted pregnancies, and initiating earlier action by heath education and improving the literacy of population groups where there is a gender divide. Various studies have investigated the causes behind reduced uptake of legalised abortion; the subject remains controversial with pro-choice and pro-life groups contending in debates where seemingly there is no clear winner. Hence, women continue to suffer the misery from unwanted pregnancies, and illegal abortions are thus promoted by the absence of provision of legalised termination procedures in local hospitals besides the discouragement in opting for abortion in various populations. Nonetheless, among certain groups, there is more acceptance of legal abortion under traumatic conditions, such as rape, health problems, or fetal congenital deformity.

There is a need to gain a better understanding of the nature of attitudes towards abortion but studies on abortion attitudes are limited, with variations affected by culture, and often, country specificity. For example, in the USA, although abortion was legalised in 1973 and the State acknowledges the right of a private person to access it, the State is not committed to do so, thereby making it unrealistic for many [115]. When comparing American and Japanese University students' attitudes towards abortion [116], it was concluded that among American students, symbolic predisposition of religiosity, conservatism, moral traditionalism, and gender-role attitudes were stronger. In another publication when comparing Greek and American samples [47], a difference in attitudes in the samples was found. This was more applicable in explaining the social model than the physical model, and was related to religiosity and sexual liberalism. Religiosity had a smaller impact on sexual liberalism in Greece, and was more strongly related to abortion attitudes whereas education had a weaker influence in Greece than in the USA. Gender attitudes are an important factor [117] as black women support there abortion whereas black men do not.

This was in accordance with traditional gender role attitudes, although with the passage of time, some white women were showing a trend towards traditional conservatism that opposed abortion, after previously being more liberal and supporting it.

More South African male students than females [118], felt that the father should have the right to prevent the mother from having an abortion, and most disagreed that having an abortion should be the woman's decision. It has been reported that there has been no reduction in the unintended pregnancy rate, which has been around 49% since 2001 [115] in the USA. The probable reasons for abortion have been that childbearing would interfere with education, work or caring for relatives, socioeconomic constraints, and a lack of partner support [119]. Unknown to many of their parents, Greek adolescents have sought abortion [120] citing socioeconomic reasons for it, despite knowing that their Church leaders forbade it; this increased their psychosociocultural dilemma. In Latin America, women chose medical abortion, and were satisfied with it [121] other than when it failed, and they had to undergo the surgical procedure for evacuating the uterus subsequently.

In recent years, various forms of contraceptive techniques have emerged but many women exposed to unprotected sex have been unable to access these because of lack of health education, sociocultural stigma, and religiosity. Hormonal contraception, or that obtained by inserting an intrauterine device needs promotion as acceptable methods. Levonorgestrel in the appropriate dose can be given within 72 hours of an episode of unprotected intercourse. It can prevent around three-quarters of pregnancies, and can be used on more than one occasion in a short span of time. The precise mechanism of action is not known, although it is said to act by disrupting ovulation or corpus luteal function. A progestogen receptor modulator (ulipristal) can also be used for up to 120 hours following intercourse. Similarly, a copper IUD can be inserted for up to 5 days following unprotected intercourse, and can be removed once the next period has started or it can be left *in situ* for contraception. It prevents implantation and has an embryotoxic effect. Antibiotics will be needed if there is a risk of sexually transmitted infection at the time of insertion.

Many assault victims hope that they will not get pregnant, and if they find out that they are pregnant can turn to illegal abortion if they find legalised healthcare is inaccessible. Illegal abortion contributes most to the maternal mortality worldwide, with the recent global figures being 387 per 100 000. The risk of procedure-related mortality increases as pregnancy advances. The reduction of stigma to obtain emergency contraceptives, along with stigmatisation of rape victims needs to be discussed with community representatives for wider implementation among different population groups.

Ethical issues

Ethics is a minefield, with the pro-life and pro-choice factions debating the abortion controversy. Familial and sociocultural pressures may influence the decision for termination. Even after a sexual assault, a female may not be allowed to participate in the decision-making regarding her relevant management issues, and can be compelled to accept decisions, which are not freely made by her. The resulting psychosomatic symptoms progressing to a disease can be minimised by early identification, and support in reaching a decision about a suitable method of termination. Can the sociocultural, and familial interconnections be wholly ruled out from the calculations of the right decision about termination of the pregnancy resulting after an assault? Such questioning and certain other issues related to abortion remain unclear, and are likely to remain so because of the complex biopsychosocial associations in each individual contemplating an abortion. Further research is called for which may clarify pertinent ethical issues regarding the mother's feelings about termination, and her attitudes towards her unborn fetus.

Relevant issues in abortion, contraception, and family spacing

In clinical practice, unwanted pregnancies are seen both after sexual assault, and unprotected intercourse in a normal relationship. This has led to a total of induced abortions of 42 million in 2003, an annual abortion rate of 12 per 1000 women in Western Europe, and 21 per 100 women in North America. Of these 48% were unsafe, with 97% of the unsafe abortions being carried out in low-resource countries [122].

Access to emergency contraception should be available for all women who have been sexually assaulted. Even where there is provision of contraceptive services, there is less/ineffective usage of contraception by those who are less knowledgeable about contraceptive measures, particularly teenagers and young adults. Again, there are those who are unable to use contraception or decide about abortion because of the male partner's wishes [123], or other religious/cultural beliefs that denounce abortion. The reasons behind reduced uptake of contraception for family spacing in certain population samples remains under-researched. The view towards a pregnancy can change from unwanted to wanted and vice-versa, with some experiencing ambivalence later on, even if they were wanted pregnancies initially. This needs further investigation.

Training

Training of health professionals to deal with these matters sensitively and efficiently should continue, and be prioritised to reduce the associated maternal mortality rate. Thailand has managed to promote usage of contraception, and now has a larger young workforce, thereby bringing about a more positive economic revolution, and progressive health promotion by building human capital.

Training of healthcare professionals to reduce obstetric and gynaecological morbidity from gender violence needs greater attention globally. The Royal College of Obstetricians and Gynaecologists (RCOG), UK, developed an AT Module for training, based on the recommendations of their study group on 'Violence Against Women' (December 1997), which can be applied for training. The Department of Health's Report, UK, also advocates training and education of all health professionals in routine screening for identifying cases of domestic violence.

Management and support pathways for managing gender-based violence

There should be meticulous and confidential reporting of domestic violence and/or sexual violence with specific advice being given to the victim about informing the police. The same health professional should follow-up the patient, and they should have an exit plan in place in case the violence escalates. Health practitioners should ask simple questions in screening for domestic and/or sexual violence, and should be non-judgemental with added empathy, if the answer is in the affirmative. The patient's safety should be assessed, and hospital admission may be needed when the condition escalates. One should not be taken up by the apparently caring person/partner who is perpetrating the violence. Victims should be given information about local support groups, such as Women's Aid Federation in the UK, and other relevant region/country specific support networks.

Prevention of gender-based violence

Role of the partner

Partners should be persuaded to participate in the prevention of violence, and its impact on the victim and any children. They should be given relevant information and supported in behaviour

change, besides being given the option (if possible) to move away from fraternal groups who promote gender violence as one of the characteristics of masculinity.

Role of the community

A community should show zero-tolerance to gender violence, and shame perpetrators rather than stigmatise victims. Community and religious leaders who have an influence on the local population could bring about changes in attitudes in this respect, so that the perpetrators of violence change such behaviour. Perpetrators should be made to take a greater responsibility regarding their actions and encouraged to seek help for behaviour modification. Help should be available for both partners, and they should be encouraged to join support groups to help cope with the problems of abusive relationships.

Role of the obstetrician/gynaecologist

- Using a traditional approach, an obstetrician/gynaecologist can influence symptomatic care but has a marginal/no influence on repeat hospitalisation of vulnerable patients.
- Non-recognition of the impact of aggravating/maintaining biopsychosocial factors will worsen outcomes. An obstetrician/gynaecologist cannot largely influence sociocultural propagating factors or political will, so many will have to contend with managing victims who seek help during patient encounters.
- Routine screening for abuse and appropriate intervention strategies that include case management and multi-agency collaboration during pregnancy are essential to prevent escalating abuse, and further trauma. In the health sector, interventions have to go beyond training and curriculum reform to a systems-wide approach, where providers also work at the community level to support victims. This would also conform with our improved understanding of the causes of violence that are suggested both clinically and in anthropological studies [64]. This could create a more acceptable and sustainable management policy tailored to different populations globally.

All these measures would facilitate ethical, cost-effective medical practice by health professionals, and prevent harm to both the patient, and the attending clinician. Health professionals can feel inadequate if unable to influence the pertinent gender-based issues that perpetuate violence with a psychosomatic impact, globally.

Conclusions

Social and environmental determinants, often associated with population migration, whether for economic gain or for reaching a safer environment when in a war zone, can bring about a break-up of traditional support systems. This can lead to gender-related issues, including domestic, and sexual violence that are of particular relevance to the health of both adult women, and adolescents. Gender violence can lead to biopsychosocial distress, which can impair obstetric and gynaecological treatment outcomes. Hospital care is needed for many who suffer not only from the direct physical effects but also from diseases generated by mind and body (psychosomatic) interactions. It has varied presentations, many of which may be due to the individual victim suppressing facts when feeling less secure in divulging the trauma from physical and psychological abuse. Continuing wars restrict movements in war zones preventing access to the limited healthcare available. This lack of appropriate healthcare provision continues when refugees migrate to settle elsewhere. Nuclear families, and the loss of social deterrents when moving to new surroundings after migrating, may increase the likelihood of gender violence in susceptible relationships, or in

the midst of warring factions. Early recognition and disclosure could be facilitated by the non-judgemental, caring health professional, who can communicate with cultural sensitivity. This is promoted in psychosomatic training. The seven vignettes have illustrated the effects of physical and mental ill-health in emigrants, and refugees.

The economic burden on the healthcare system caused by gender-related issues could be reduced by the early recognition and the channelling of support services according to individual need. Research is scarce and partners can discourage participation for fear of being exposed as perpetrators. Hence, involvement of the partner in reducing the prevalence of gender-related issues is a challenge. FGM, a special form of gender-based violence, which is widely prevalent in Africa, parts of Asia, and South America, has physical, mental, and social sequelae. Affected women have migrated worldwide, so its health consequences need to be treated in the countries where these women/girls reside.

Development of, and easier access to, support groups along with the involvement of community leaders could reduce the incidence of assault in affected populations. Where required, access to information about contraception both for emergencies, and if needed for family spacing, should be part of universal health education. More media involvement is needed to support community incentives to reduce the prevalence of gender-related issues for they have dire consequences on adolescent and women's health. Sizeable numbers in the medical profession have been reluctant/uncomfortable in addressing these issues, even if encountering such problems on a regular basis. Further training for a pro-active medical role would not only help reduce morbidity, and mortality from gender-based violence but reduce any impact on infant, and family health.

Hospitals worldwide face a disease burden due to the effects of migration and gender-related issues. It would therefore be economically sound to prevent/stop the gender-related violence so that treatment-associated expenses can be channelled to manage less-preventable diseases.

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Appendix

Self-assessment and reflection—Clinical scenarios from real-life encounters

Practise of psychosomatic evaluation and applying a 9-field matrix

1. Mrs PW, a 24-year-old Caucasian primipara, complained: 'My experience of childbirth was devastating. Urgent events overtook my labour plan. I was very shocked and scared. I had a placental "bleed" at home. I suffer from a feeling of intense fear even now'. She had a normal vaginal delivery (NVD) of a male baby after an abruption 8 months prior to being interviewed. She continued, 'I am anxious and very frightened that it may recur with another pregnancy. I have had intense distress for months with nightmares. I keep on thinking that it will happen again. It has put me off having another baby'.

Assessment questions:

   a. What is your provisional diagnosis about Mrs PW's problem/s? Would you be able to manage her problem/s effectively using the routine (non-psychosomatic) approach?
   b. What should be added to her history that would facilitate applying a psychosomatic approach?
   c. How would you carry out a psychosomatic assessment to evaluate relevant biopsychosocial factors (with necessary investigations) after obtaining the complete history?
   d. How would you manage her problem/s using the psychosomatic perspective?

2. Mrs AR, a 28-year-old Caucasian primipara, who lived with her husband, a busy accountant, had delivered a female baby by emergency caesarean delivery 10 months previously. She felt her delivery and postnatal experience were horrendous. She had mood swings. Her health visitor thought she was depressed, and informed her GP regarding screening her for depression. Mrs AR refused such an assessment for fear of stigmatisation if any of her acquaintances came to know of her problem. Her previous friends did not have young children, and did not make allowances for Mrs AR's maternal tasks.

Assessment questions:

   a. What is your provisional diagnosis about Mrs AR's problem/s? Would you be able to manage her problem effectively using the routine (non-psychosomatic) approach?
   b. What should be added to her history that would facilitate applying a psychosomatic approach?
   c. How would you carry out a psychosomatic assessment to evaluate relevant biopsychosocial factors (with necessary investigations) after obtaining the complete history?
   d. How would you manage her problem/s using the psychosomatic perspective?

3. Mrs MA, a 23-year-old immigrant primipara, who had a NVD of a live female baby began feeling low, and very anxious after childbirth. She felt she looked after her baby well, and prevented any infection by keeping things clean, besides washing her hands several times before carrying out baby-related chores. Yet, her baby was not gaining weight, and cried a lot even though she fed her well. Mrs MA looked after an extended family. She was not allowed to go out, other than once a month when the family visited their place of worship. She was a University graduate, and had felt respected prior to her marriage. She did not seek help for fear of reprisal from her family, and of being ostracised by her community. Repeatedly washing hands, and maintaining cleanliness would not harm her.

Assessment questions:

   a. What is your provisional diagnosis about Mrs MA's problem/s? Would you be able to manage her problem effectively using the routine (non-psychosomatic) approach?
   b. What should be added to her history that would facilitate applying a psychosomatic approach?
   c. How would you carry out a psychosomatic assessment to evaluate biopsychosocial factors (with necessary investigations) after obtaining the complete history?
   d. How would you manage her problem/s using the psychosomatic perspective?

4. After an elective caesarean, Ms JB, a 28-year-old woman, had been suffering from reduced bladder control, and sometimes faecal urgency, which was interfering with her daily commitments, and her relationship with her partner. This caused her to feel downcast most of the time but she was too embarrassed to seek help. She had a mild loss of urinary control before pregnancy but her symptoms worsened during pregnancy, and after delivery. There was no sign of symptomatic relief after a year, causing her to wear a pad constantly. She was referred by her health visitor for further assessment and advice.

Assessment questions:

   a. What is your provisional diagnosis of Ms JB's problem/s? Would you be able to manage her problem effectively using the routine (non-psychosomatic) approach?
   b. What should be added to her history that would facilitate applying a psychosomatic approach?
   c. How would you carry out a psychosomatic assessment to evaluate biopsychosocial factors (with necessary investigations) after obtaining the complete history?
   d. How would you manage her problem/s using the psychosomatic perspective?

5. Miss RM, a 19-year-old woman, had a history of provoked vulvodynia since her first attempt at intercourse at the age of 15. In the last year, she had undergone vestibulectomy, privately, and was now referred for a second opinion because there had been no improvement in her symptoms.

Assessment questions:

   a. What is your provisional diagnosis about Miss RM's problem/s? Would you be able to manage her problem/s effectively using the routine (non-psychosomatic) approach?
   b. What should be added to her history that would facilitate applying a psychosomatic approach?
   c. How would you carry out a psychosomatic assessment to evaluate biopsychosocial factors (with necessary investigations) after obtaining the complete history?
   d. How would you manage her problem/s using the psychosomatic perspective?

The provisional diagnosis and management of each clinical scenario presented above could be pondered upon/discussed by a reader/learning group.

Postface: gender-related social constructs and fertility

Mira Lal and James Drife

At the start this book, the evolution of the scientific basis of psychosomatic interactions in health and disease was discussed. As food for thought, it will end with a brief discussion of social constructs in disease generation, particularly as regards to fertility. 'Social constructs' can be defined as a category that is created by society to describe the role of an individual or group of members that constitute it and, among other factors, it includes gender. There are various reasons why an individual or group of members are respected (or not) by the society to which they belong, which has varied at different points in time during the history of the human race. For instance in ancient Sparta [1], females were educated, owned property, and were respected in society, which will have promoted self-worth, as they were to bear healthy males—the future 'warriors'; this was in contrast to the social constructs for other Greek women, notably the Athenians. Again, healthy female children were desired by the Spartans for they in turn would bear healthy progeny. Social constructs supporting such maternal behaviour would be beneficial even now, as stress during pregnancy and labour can affect the fetus, with a predilection towards male fetuses, although this evidence is sparse [2].

Similarly, in the late nineteenth century, the separate natures, and roles of women and men in society, were defined by the impact of the industrial revolution [3]. Mechanised labour was considered to be the domain of men, whereas women took up domestic responsibilities, and the rearing of the child. As social needs promoted fertility, women bore a large number of children to make up for the high infant/child mortality rate, which was prevalent at the time. At the start of the early twentieth century, suffrage (equal voting rights) became a topical issue, with both men and women being involved in seeking this right, and women began participating in public life. Yet, prestigious roles such as those related to the economy or politics were still under male control. In the USA, the first college exclusive to the education of women was opened in 1865, but only upper-middle-class women could avail of such learning, as their families could pay the necessary educational expenses. Among other restrictions, most men did not want women to vote, as there was a fear that their votes could modify the results, as women represented 51% of the population; some men felt that women did not understand the issues related to the voting. In 1920, women in the USA obtained voting rights, and liberal thoughts seemed to be removing the social barriers to women's progress. Nonetheless, due to a stock market crash in 1929, gender roles were tightened again to traditional social constructs.

During the Second World War, roles changed again with the men going to war, so women filled in the production and wage earning gaps that had been occupied by men, as a patriotic duty. They were able to retain femininity while holding on to these additional tasks but at the end of the war, the men returned and went back to their jobs, with many women being fired. The advent of consumer items, such as the vacuum cleaner gave women more freedom, and their efficiency at housework increased, so some were able to continue to work as teachers or nurses, along with bearing children and caring for them. In 1964, the US Civil Rights Act was passed to prevent discrimination on the basis of race, age, ethnicity, and lastly, gender. In the early 1990s, some

men wanted to spend more time at home but gender-related restrictions were in the main, still imposed, as they were expected to spend more time in the workplace.

In Britain, during the twentieth century, women could evade the role allotted to them by social constructs, namely, to marry young, stay home, and raise a family. Their forebears in the late nineteenth century had struggled to improve women's education, with campaigners such as Millicent Fawcett and Elizabeth Garret Anderson carrying out a personal, and largely peaceful struggle, to open professions such as medicine to women in the UK, which Elizabeth Blackwell had succeeded in obtaining by overcoming major opposition in the USA. However, only the privileged few, whose fathers or husbands were enlightened enough to permit it, were able to avail of this opportunity. By the middle of the 1980s, working women were, in the main, still in traditionally feminine professions, e.g. teaching, where their chances of advancement were few, and their pay did not increase commensurately with the economy. In the 1990s, American women realised that they could obtain leadership roles, but it required more effort, and they had to be exceptionally better, and had to devote substantially more time to their occupation than men. Although society still required women to bring up children, they could now plan for a smaller family size, as medical advances had reduced the fetal/child mortality rates.

However, pregnancy spacing to regulate family size involves the use of contraceptive measures, and some religious leaders have opposed all methods other than natural family planning when regulating fertility. Conversely, starting a family too late can compromise fertility with age-related reduction in fecundity, along with that associated with the continued usage of certain hormonal contraceptives. Many women have felt that the influence of social constructs, which promote childbearing, are not enough to achieve happy, successful pregnancy outcomes. Stressful lifestyles can affect fecundity, as can obesity and polycystic ovarian disease (see Chapter 8). Infertile women/couples often seek assisted conception (see Chapter 6), although the relevant literature confirms its limited success along with its certain risks. It may, nevertheless, be the only option for some infertile couples who have to access private healthcare, though this approach can be expensive. Furthermore, infections with chlamydia/tubercle bacilli [4], along with environmental factors reduce the chances of natural or assisted conception by affecting the structure and functioning of female pelvic reproductive organs. Environmental factors also compromise the male contribution to fertility [5].

Therefore, when considering the relation of male factors with infertility, the association of testosterone with aggression, and in animal species with warring, for the chance to pass on their genetic material, deserves attention. Indeed, it is not so long ago that rulers had concubines and sultans had harems, but most human societies favoured monogamy. In the twentieth century, as infant/child mortality fell in the UK, there was a dramatic reduction in family size—a change that was well under way before the advent of the contraceptive pill. With smaller families came changes in social constructs. Women became enfranchised, worked in factories, and eventually entered the professions in steadily increasing numbers, working alongside their male colleagues. Freed from the continuous cycle of pregnancy and lactation, women sought gender equality in all social spheres. Excluding women from male-dominated organisations became illegal. A new category of males was transforming the social horizon.

Biologically, however, there were problems with the new model of man [5]. A twentieth century specialism—Andrology, emerged, and researchers have discovered worrying changes in the male reproductive system. The average sperm density, across various studies, have revealed a steady fall from about 120 million/mL in 1930 to around 60 million/mL in 2000, with no signs of levelling out. During the same time period, rates of testicular cancer have risen dramatically in Denmark and Norway, and, to a lesser extent, in some other Baltic countries. Male reproductive dysfunction and cardiometabolic disorders, such as hypertension and type 2 diabetes, along with

associated abdominal obesity, have surfaced; these are interlinked with late-onset hypogonadism (low testosterone level), which is an important determinant and/or consequence of these preventable health conditions. Concomitantly, the age of onset of these disorders is now falling from the previous >45 years, and may even arise in childhood. Moreover, there is a high incidence of congenital reproductive malformations, such as cryptorchidism and hypospadias, which can also affect semen quality. Evidence of such detrimental effects on the male fetus if the pregnant woman is exposed during early pregnancy to environmental disturbing chemicals such as pesticides and flame retardants, is emerging [5]. In the USA, studies have revealed a fall in plasma testosterone, at least in men aged >50, with testosterone levels among similarly-aged men being significantly lower in 2002–2004 than they were in 1987–1989. All these biological issues, along with psychological and social factors, contribute to subfertility in the male.

Social constructs have been amended whenever gender roles have changed, which also relate to fertility/infertility. In the USA, around 40% of men and women prefer 'traditional' gender roles but the majority are happy with the new roles, and social interactions. Many husbands are accompanying their pregnant partners and attending labour, as well as spending more time with their children. Around 50% of fathers claim to take equal responsibility for childcare. This should be beneficial for the child's upbringing towards becoming balanced future adults, particularly where nuclear families without social integration are isolated due to migration (see Chapter 12). Fertility can be affected by work–life conflicts, which is now reported by 60% of men, compared with 35% in the 1970s, while the proportion of women reporting work–life conflicts has remained at 40–45%. Employers who may inadvertently create stress at the workplace may have to be educated to reduce workplace tension that can impinge on the employee's biopsychosocial health, and among other adverse effects, impact negatively on conception/pregnancy outcomes in those desiring a family. In the UK, the proportions of men and women employed are slowly approaching parity but the gender pay gap persists at older ages, and can be stressful for those affected. In the USA, men are less likely than women to receive work-related training and more likely than women to be made redundant in times of economic difficulty [6]. A contracted economy puts constraints on healthcare provision.

In conclusion, we are living through a time of transition in social constructs. The twentieth century saw women battling for their rights in developed countries, and many believe that this struggle is not yet over. In developing countries, it has hardly begun. Workplace environment can impact on fertility. Fertile females and males are required for the creation of healthy children and furtherance of the human race, so both genders should be given equal attention. Our evolving social constructs should learn from the ancient civilisations regarding what is fitting for this 'space age'.

The benefits of promoting self-esteem is portrayed in this exchange from ancient Greece: 'When asked why Spartans were the only Greek women who "ruled" their husbands, Gorgo, the wife of King Leonidas of Sparta, said, '*Because we are the only women who give birth to men*'; specifically, their men had enough self-confidence to accept women as equals, so were actual 'men'.

We could emulate their balanced approach in promoting psychosomatic health.

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