Obstetrics

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JP

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Antenatal clinical essentials

chapter 3

The focus of this chapter is the care provided in a healthy pregnancy. Good antenatal care:

- Detects disease or disorder
- Stratifies risk
- Optimises maternal health
- Detects conditions unique to pregnancy (e.g. pre-eclampsia) to enable effective management

Normal pregnancy is characterised by physiological changes that cause many of the symptoms commonly experienced in pregnancy, such as abdominal pain, nausea and back pain. These symptoms require assessment, but they usually cease postpartum and management is therefore conservative.

Modern obstetric care is best conceptualised as an inverted pyramid (**Figure 3.1**): most involvement of healthcare professionals and most decision-making occur in the first trimester (weeks 0–12; **Table 3.1, Figure 3.1**), often at the first antenatal (booking) visit. This contrasts with the traditional approach with its focus on the last trimester, which is still widely practiced.

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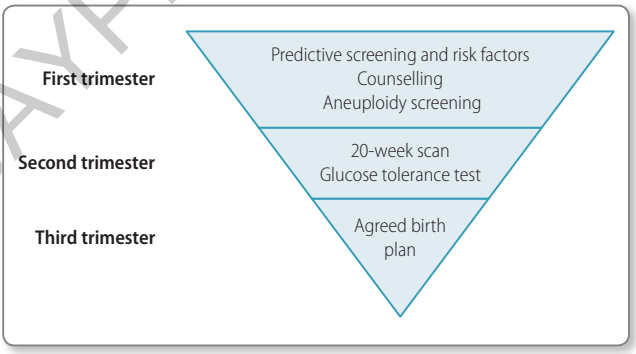

Figure 3.1 The pyramid of antenatal care: the predictive and proactive model.

Trimester	Weeks	Key events in fetal development
First	0–13	All organs start to form
Second	14–27	Nervous system matures Fetus responds to stimuli Hair and nails form
Third	28–40	Body fat laid down Lungs mature (at 39 weeks)

Table 3.1 The trimesters of pregnancy

3.1 Clinical scenario

Nausea and vomiting in the first trimester

Presentation

A 24-year-old childcare worker presents for antenatal care at 8 weeks' gestation. She is distressed by constant nausea and daily vomiting that has worsened over the past 2 weeks. Today, she has been unable to tolerate food but can manage to drink some fluids. Her body mass index is 31 kg/m^2. She smokes 10 cigarettes daily and drinks alcohol socially. No other significant medical or surgical history is noted, and the medication history reveals no use of medications or supplements and no drug allergies. This is her first pregnancy, and she has never had a cervical smear. Her menstrual cycles are generally irregular. She presents with no antenatal investigations to date.

Clinical assessment reveals a nauseated young, obese woman with normal observations. There is no postural drop in blood pressure on standing. Breast, thyroid, and cardiorespiratory examinations are unremarkable. The fundus is impalpable abdominally.

Diagnostic approach

Nausea and vomiting in pregnancy affects over 80% of women in the first trimester, and this is the most likely diagnosis. It classically starts at 6 weeks' gestation, and symptoms ease during the second trimester. Many conditions can cause nausea and vomiting in pregnant women, but in this context, diagnosis is generally straightforward.

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Women experiencing nausea and vomiting are asked about features that support the diagnosis of nausea and vomiting in pregnancy. These include typical onset, associated ptyalism (excessive production of saliva), aversions to certain foods and increased sense of smell. Women who describe atypical features of nausea and vomiting in pregnancy are questioned about features of the differential diagnoses, both obstetric and general (**Table 3.2**).

Vomiting that causes weight loss and ketosis and requires admission to hospital is termed as hyperemesis gravidarum (see page 155). It is a rare but serious and often undertreated form of nausea and vomiting in pregnancy.

Further investigations

In most pregnant women, exclusion of other causes of nausea and vomiting requires little investigation. In this case:

- The results of full blood examination, measurement of serum electrolytes, and liver function and thyroid function tests show no evidence of dehydration, infection, biochemical hyperthyroidism or biliary disease
- A pelvic US dating scan shows a live singleton intrauterine gestation, consistent with 8 weeks' gestation, thereby excluding multiple or molar pregnancy
- Midstream urine and routine antenatal blood tests give negative results for serological markers of viral infection, thereby excluding a diagnosis of urinary tract infection or viral hepatitis

Category	Conditions	Features
Obstetric	Molar pregnancy	Fundus larger than expected for dates, vaginal bleeding, passage of vesicular tissue
	Multiple pregnancy	Fundus larger than expected for dates, presence of risk factors for multifetal gestation
General medical	Urinary tract infection, pyelonephritis, hyperthyroidism, diabetic ketoacidosis, peptic ulcer disease, biliary disease and hepatitis, gastroenteritis, mass lesions of the central nervous system, migraine	

Table 3.2 Nausea and vomiting in pregnancy: differential diagnoses

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Management

This woman has nausea and vomiting in pregnancy and obesity. Other issues are current substance use, uncertain dating of pregnancy, occupational exposure to potentially teratogenic infections, and lack of antenatal investigations or vitamin supplementation.

She is provided with:

- Reassurance that the nausea and vomiting are self-limiting and unlikely to harm the developing fetus
- Written and verbal information regarding non-pharmacological measures to ease the symptoms, such as eating small, bland meals at regular intervals
- First-line antiemetic medications, including metoclopramide, doxylamine and pyridoxine

She is asked to return if her symptoms worsen. She is informed about the obstetric complications associated with obesity and encouraged to adopt healthy eating and exercise habits. She is given high-dose folic acid, vitamin D3 (cholecalciferol) and iodine supplements. The importance of hand hygiene is emphasised to minimise the risk of transmission of cytomegalovirus, herpes simplex virus and other teratogens.

An estimated date of birth (due date), based on the results of the US scan, is documented in her handheld maternity record. She is encouraged to stop smoking and drinking alcohol and given details of where she can get support for this.

Clinical insight

Providing written information is a valuable adjunct to verbal counselling. Along with putting women in touch with support groups, it is part of a multimodal approach to patient education and the promotion of health literacy and independence.

Guiding principle

In typical cases of nausea and vomiting in pregnancy, affected women are reassured that the symptoms resolve over time and that the baby will not be harmed by them. In contrast, hyperemesis gravidarum can cause fetal growth restriction and other adverse obstetric and psychological outcomes. Therefore, women affected by this condition require higher-risk pregnancy care.

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The offer of non-invasive prenatal testing is accepted. An early 12-week structural scan, along with a mid-trimester (morphology) scan and 26-week glucose tolerance test are also arranged. The nausea and vomiting settle by 16 weeks' gestation, and no further treatment is required.

3.2 Common symptoms during pregnancy

Many pregnant women experience symptoms due to either the physiological adaptations of pregnancy or pathological processes. Although most are minor, all require careful assessment to exclude conditions with potentially serious sequelae. Information gathered from the history (see page 57) and examination (see page 64) enables identification of conditions that require diagnosis, monitoring and treatment.

Abdominal pain

Abdominal pain is the symptom most frequently experienced during pregnancy. Severe pain must be distinguished from mild pain, because each requires a different approach. Symptoms warrant investigation if history and examination suggest a serious non-obstetric cause, such as peptic ulceration, bowel pathology, fracture, cardiac pathology, lung disease or pulmonary embolus, which are uncommon with mild pain alone.

Mild abdominal pain

Benign abdominal discomfort is common. It is due to anatomical, endocrine and ligamentous changes.

- Pressure exerted by the enlarged uterus compresses the nearby small and large bowels as well as the biliary tree, thereby interfering with their function; it also pushes the diaphragm superiorly, altering respiratory mechanics and contributing to the physiological breathlessness that accompanies pregnancy
- The hormonal environment of pregnancy, particularly the increased levels of progesterone, relaxes the smooth muscular wall of intestinal organs, leading to constipation and reflux as a consequence of slow peristalsis

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- Ligamentous and soft tissue changes to the pelvis and abdominal wall increase pelvic pain and back pain with movement, due to increased laxity. This effect becomes more marked with successive pregnancies

Clinical insight

Mild abdominal pain in pregnancy is common.

Reassure the woman that the symptoms do not indicate a potentially serious condition, and manage conservatively with analgesia, dietary modification, exercise, abdominal support and physiotherapy.

Guiding principle

A 'high index of clinical suspicion' means that a specific condition is strongly suspected based on the presentation, symptoms and signs. It prompts specific investigations to confirm the suspected diagnosis.

Clinical insight

Nausea and vomiting in pregnancy is common.

Treat it conservatively, advising women to eat smaller meals at shorter intervals and drink water. However, in cases of dehydration, weight loss or electrolyte derangements, in-patient admission, IV fluid administration, antiemetic therapy and thiamine (vitamin B1) supplementation are appropriate. In very severe cases, which are rare, total parenteral nutrition is necessary to avoid starvation.

Severe abdominal pain

Severe abdominal pain requires a high index of suspicion for an underlying pathology with the potential to cause significant harm. Causes are divided into:

- Obstetric and gynaecological causes in early or late pregnancy (**Tables 3.3** and **3.4**), respectively)
- Other medical and surgical causes (**Table 3.5**)

Pregnancy alters the presentation of some non-obstetric conditions, e.g. appendicitis. Particular suspicion is required, because these conditions have a worse outcome if the diagnosis is missed in pregnancy.

Nausea and vomiting

Nausea and vomiting are common symptoms of pregnancy. The cause is incompletely understood but partly related to the increased levels of beta-human chorionic gonadotrophin (β-hCG) in maternal serum. This probably explains why women with molar or

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Cause	Clinical features	Investigations
Miscarriage	Vaginal discharge or bleeding with abdominal pain	Speculum examination, β-hCG concentration and transvaginal US
Ectopic pregnancy	Triad of amenorrhoea, lower abdominal pain and bleeding from the vagina	β-hCG concentration and transvaginal US
Ruptured ovarian cyst	Acute abdominal pain with or without peritonism, hypotension and tachycardia	FBE, inflammatory markers and pelvic US
Ovarian torsion	Acute colicky abdominal pain, nausea, vomiting, and presyncope or syncope (vagal response)	FBE, inflammatory markers and pelvic US
Fibroid degeneration	Localised abdominal pain with nausea and vomiting	FBE, inflammatory markers and pelvic US
Ovarian hyperstimulation syndrome	History of ovarian stimulation (e.g. in IVF) is required Generalised abdominal pain with distension Nausea, vomiting, diarrhoea, dyspnoea and peripheral oedema also occur	FBE, UEC, LFT, coagulation profile, midstream urine test and pelvic US

FBE, full blood examination; β-hCG, β-human chorionic gonadotrophin; LFT, liver function test; UEC, urea, electrolytes and creatinine; US, ultrasound.

Table 3.3 Abdominal pain in early pregnancy: causes

multiple pregnancy or carrying a fetus with Down syndrome, which are all conditions associated with higher than expected concentrations of β-hCG, experience more severe nausea and vomiting.

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Cause	Clinical features	Investigations
Labour	Regular painful abdominal contractions with progressive cervical changes	CTG or intermittent auscultation of fetal heart
Placental abruption	Constant uterine pain, including between irritable contractions, with or without vaginal bleeding	CTG, FBE, UEC, coagulation studies and blood group and hold (test to determine blood group of mother and prepare for potential transfusion of blood products)
Uterine rupture	Acute abdominal pain with vaginal bleeding and hypovolaemic shock Uncommon outside labour and requires the presence of a uterine scar	CTG, FBE, UEC, coagulation studies and blood group and hold
Chorioamnionitis	Abdominal pain with fever and offensive vaginal discharge	CTG, FBE, inflammatory markers, MSU, vaginal swab and blood culture
Pre-eclampsia	None, or epigastric abdominal pain with headache, nausea, vomiting or visual disturbances	FBE, UEC, uric acid, urinary protein concentration and assessment of fetal growth and well-being (CTG, US)
Acute fatty liver of pregnancy	Right hypochondrium abdominal pain with jaundice	CTG, FBE, LFT, coagulation panel and hepatitis serology

CTG, cardiotocography; FBE, full blood examination; LFT, liver function test; UEC, urea, electrolytes and creatinine; MSU, mid-stream urine.

Table 3.4 Abdominal pain in late pregnancy: causes

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Clinical insight

Lower back pain is common in pregnancy.

Non-pharmacological therapy, such as physiotherapy, support belts, and heat or cold pads, is effective for mild lower back pain. Prescribe analgesia for cases of moderate to severe lower back pain, or any back pain associated with sciatica. Avoid non-steroidal anti-inflammatories as they impair fetal renal function and promote premature closure of the fetal ductus arteriosus.

Lower back pain

Lower back pain in pregnancy is caused by a combination of weight gain, hormonal changes, musculoskeletal relaxation and alteration of posture. Lower back pain that radiates to the back of the thigh or is associated with lower limb weakness or paraesthesia indicates nerve root

Cause	Clinical features	Investigation
Gastrointestinal		
Gastro-esophageal reflux disease	Epigastric burning pain after eating or lying down, with water brash and acid taste in mouth	Clinical diagnosis
Gastroenteritis	Generalised abdominal pain with nausea, vomiting and diarrhoea	FBE, UEC, LFT, inflammatory markers and stool analysis
Appendicitis	Periumbilical pain that then localises to the right iliac fossa, with or without peritonism, fever, nausea and vomiting	FBE, UEC, LFT, inflammatory markers and transabdominal US
Bowel obstruction	Colicky, generalised abdominal pain with nausea, vomiting and reduced bowel sounds	FBE, UEC and inflammatory markers
Cholecystitis	Sharp right hypochondrium abdominal pain that is worse with food intake, associated with fever, nausea and vomiting	FBE, LFT, inflammatory markers and abdominal US
Hepatitis	Right hypochondrium abdominal pain with fever, jaundice, nausea and vomiting	Hepatitis screen
Urological		
Urinary tract infection	Suprapubic pain with fever, dysuria, frequency and urgency	UEC, inflammatory markers and urine culture
Pyelonephritis	Loin pain with fever, renal angle tenderness and haematuria	FBE, UEC, inflammatory markers and urine culture

FBE, full blood examination; LFT, liver function test; UEC, urea, electrolytes and creatinine.

Table 3.5 Abdominal pain: non-obstetric and non-gynaecological causes

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impingement (also known as sciatica). Severe pain, especially when accompanied by neurological signs or bladder or bowel dysfunction, is a serious finding that should never be attributed to pregnancy without appropriate investigation. Seek a neurologist's opinion and request an imaging study (i.e. MRI) to rule out a neurosurgical emergency.

Vaginal discharge

Clear or whitish vaginal discharge without offensive smell or associated itchiness or urinary symptoms is physiological in pregnancy. Bloody or mucoid discharge indicates discharge of the cervical mucus plug (operculum) and is commonly referred to as 'show'. It can precede labour by a few days and is non-concerning. Characteristics of vaginal discharge in cases of infection are listed in **Table 3.6**; treatment is required.

Breast fullness and tenderness

Before pregnancy, a woman's breasts are composed mainly of adipose tissue. During pregnancy, the effects of oestrogen, progesterone and prolactin increase glandular breast tissue. This results in an increase in breast fullness and tenderness.

Clinical insight

Watery vaginal discharge is a sign of ruptured membranes. This possibility must be excluded during clinical assessment, particularly before a digital examination (as this procedure increases the risk of infection in the presence of ruptured membranes).

Clinical insight

Management of carpal tunnel syndrome in pregnancy

Reduce oedema in the carpal tunnel by elevating the arm during sleep, simple hand exercises and splinting, to allow the nerve to resume normal conduction.

Peripheral oedema

Increased plasma volume, hormonal fluctuations and pressure exerted on the pelvic venous system by the gravid uterus all contribute to leakage of fluid from the intravascular compartment to the interstitial space. This phenomenon manifests as lower limb peripheral oedema. In the absence of other signs of a serious cause, the woman is reassured that the oedema is physiological and will resolve after the birth.

Carpal tunnel syndrome is an example of oedema-related nerve impingement. The median nerve is compressed as it passes through the carpal tunnel on the ventral aspect of the wrist, resulting in

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Infection type	Infection	Characteristics
Yeast	Candidiasis (*Candida* spp.)	Thick, cottage cheese-like; accompanied by pruritus
Bacterial	Bacterial vaginosis	Milky white, thin; fishy odour
Sexually transmitted	Chlamydia (*Chlamydia trachomatis*) Gonorrhoea (*Neisseria gonorrhoeae*) Other cervical pathology	Clear and profuse; associated with post-coital bleeding, urinary symptoms
Protozoal	Trichomoniasis (Trichomonas vaginalis)	Yellow or grey, frothy; associated with pruritus, dysuria

Table 3.6 Vaginal discharge: types indicating infection

impaired sensory conduction and subsequent palm and finger paraesthesia and pain. These symptoms resolve postpartum.

Clinical insight

Do not reassure a pregnant woman that sleep disturbance is her body's way of 'preparing for the new baby'. This is rarely well received! It is more appropriate to gently reassure her that her experience is normal.

Sleep disturbance

Disrupted sleep, particularly during late pregnancy, is common. It is caused by a combination of musculoskeletal factors (the altered position of the ribs, hip pain from lying on one side and the need to wake fully to change to the other side), respiratory factors (airway and nasal congestion and disrupted breathing) and frequent urination.

3.3 The first antenatal visit

The first antenatal visit, commonly referred to as the booking or booking-in visit, provides the essential information needed to guide subsequent care in pregnancy and childbirth. During this visit:

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- A full history is taken
- A general and obstetric examination is performed
- Risk factors are assessed to determine whether a midwifery model of care, a medical model of care or a combination of both is most appropriate, based on the complexity of the pregnancy
- Pregnancy care, including investigations, is planned

The visit takes place as early in the pregnancy as possible, because of the limited window available for aneuploidy screening and the necessity for timely initiation of pre-eclampsia prophylaxis or other preventative interventions. Furthermore, lifestyle and dietary advice is best provided in the early stages of pregnancy, when the embryo is most susceptible to teratogenesis. Ideally, the pregnancy will have been planned and the woman has attended for preconception care. However, at least half of pregnancies are unplanned.

Clinical insight

In obstetrics, the term 'model of care' refers to the approach to providing care for women and babies during pregnancy, at delivery and in the postnatal period. An obstetrician is the lead healthcare professional in higher-risk pregnancies, and a midwife or trained general practitioner in low-risk, uncomplicated pregnancies. In medium-risk pregnancies, the responsibility is shared by a mix of healthcare professionals.

Guiding principle

Information obtained at the first antenatal (booking) visit is used to guide the care a woman and her baby receive during pregnancy, at delivery and in the postnatal period. Therefore, a detailed history and thorough examination are required. The subsequent antenatal care follow-up visits are usually much briefer and focus on ensuring that the pregnancy is progressing healthily.

The first visit provides an opportunity to counsel women about normal and abnormal symptoms, healthy lifestyle and normal weight gain, and routine blood tests and other investigations. It is also a chance to answer any questions the woman may have. It should always be kept in mind that pregnancy and childbirth are physiological events and not disease processes, and that the woman should be actively involved in decision-making regarding her care.

Any medical concerns are documented in the woman's

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