123 Doc EDUCATION

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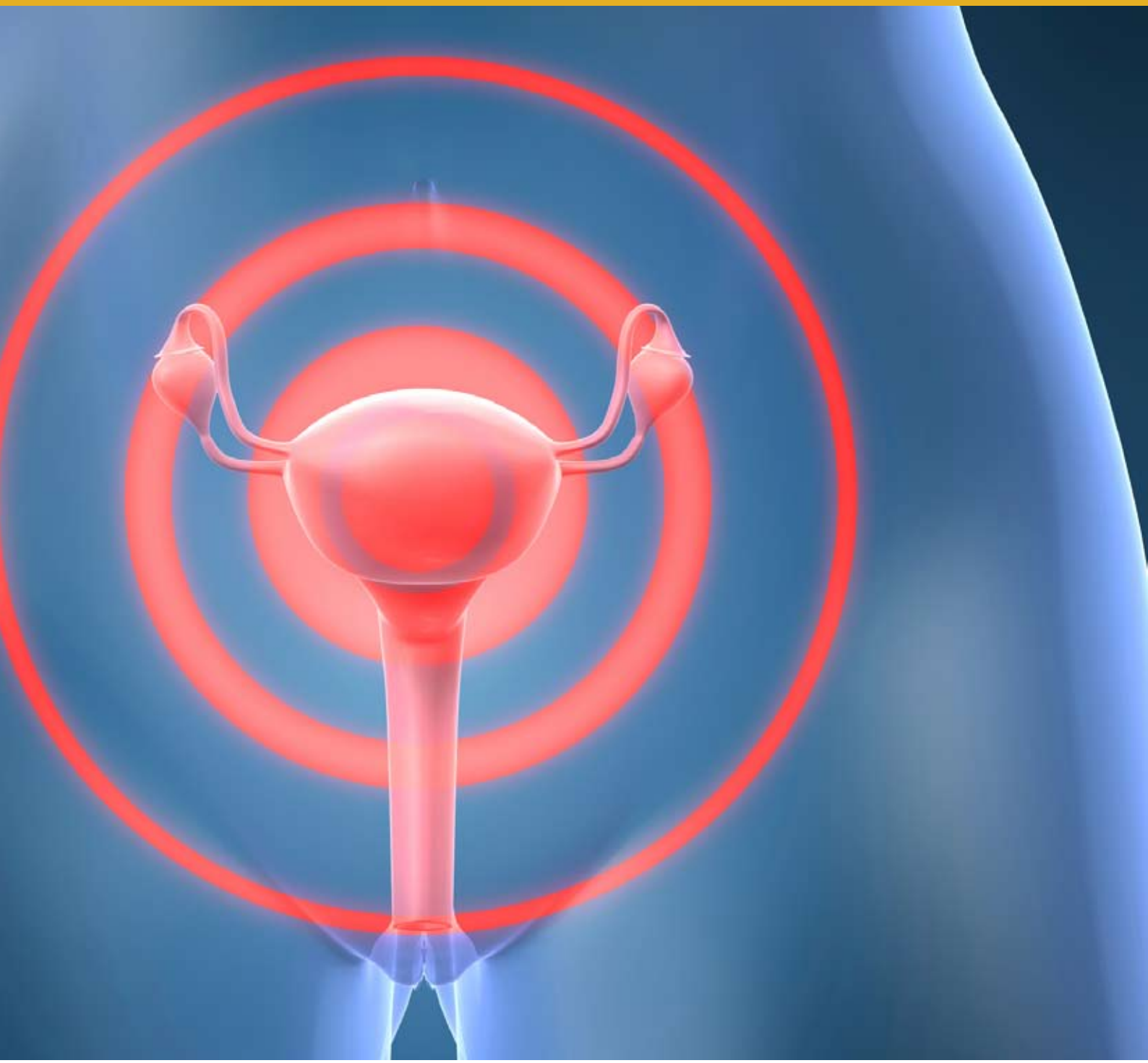
EDITOR IN CHIEF, KHALED M A KHALED

Volume 3, Issue 3: Gynaecology & Obstetrics



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Volume 3, Issue 3

Foundation Years Journal

Foundation Years Journal is an international peer-viewed journal which seeks to be the pre-eminent journal in the field of patient safety and clinical practice for Foundation Years' doctors and educators. The Journal welcomes papers on any aspect of health care and medical education which will be of benefit to doctors in the Foundation training grade in the UK or international equivalents. The predominant emphasis in **Foundation Years Journal** is on work related to patient safety and in health care education.

Editor In Chief

Associate Editor

Publisher's Office

Issue Editor

Volume 3, Issue 3: Gynaecology & Obstetrics

Foundation Years Journal is the ONLY journal for Foundation Years doctors and educators, specifically written according to the MMC curriculum. It focuses on one or two medical specialties per month, each issue delivers practical and informative articles tailored to the needs of junior doctors. The Journal closely follows the Foundation Years syllabus to provide the best educational value for junior doctors. In addition to good clinical and acute care articles, assessment questions give junior doctors the chance to gauge their learning.The answers will be published in the next issue, but 123Doc will advance answers to clinical tutor subscribers so they can engage their students in the learning process. Each issue provides comprehensive clinical cases for trainees as well as practical teaching assessments for educators. Readers will benefit from:

- **MMC CURRICULAR-BASED CONTENT** to enhance understanding of the core competencies required from future leading doctors.
- **FOCUS ON SPECIALTY-SPECIFIC CLINICAL CASES** each month to form broad subject coverage.
- **ADDITIONAL IN-DEPTH** good clinical and acute care articles aligned with the case-based discussion assessments.
- **TRAINING GUIDE FOR FOUNDATION YEAR (FY)** educators with proposed clinical cases for teaching sessions.
- **PRACTICAL AND INFORMATIVE** articles written by senior doctors and consultants.
- **EXTRA REVISION** with comprehensive assessment. Questions and Picture Quiz.

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Aim and scope

The Foundation Years Journal is published by 123doc and is aimed at doctors in Foundation Training programmes, their educational and clinical supervisors, as well as medical students and other doctors (particularly international medical graduates) who intend to start Foundation training in the United Kingdom.

Journal sections

The Journal has been redesigned and various sections have been introduced to map the Journal more closely to the Foundation programme curriculum. You can view the curriculum from **http://www.foundationprogramme.nhs.uk/pages/home/training-and-assessment**.

The sections are the following:

1. Good Clinical Care (syllabus section 1)
This section deals with various aspects of patient management including history, examination, diagnosis, record keeping, safe prescribing and reflective practice. Articles could also refer to other aspects of care including time management, decision-making, patient safety, infection control, clinical governance, nutrition, health promotion, patient education, public health and ethical and legal issues.

2. Good Medical Practice (syllabus section 2)
Articles could be on learning, research, evidence-based guidelines and audit.

3. Training and Teaching (syllabus section 3)

4. Professionalism in Practice (syllabus sections 4,5 and 6)
This section includes relationship with patients, communication skills, working with colleagues, probity, professional behavior and personal health.

5. Patient Management (syllabus section 7)
Articles should be focused on the recognition and management of the acutely ill patients, core skills in relation to acute illness, resuscitation, management of the 'take', discharge planning, selection and interpretation of investigations.

6. Practical Procedures (syllabus section 8)

7. Test Yourself
The intention is to provide a vehicle whereby trainees and educational supervisors can present original and review articles mapped against the Foundation curriculum.

Submission of manuscript

All articles submitted to the Journal must comply with these instructions. Failure to do so will result in return of the manuscript and possible delay in publication.

Manuscripts must be submitted exclusively by email (see detailed instructions below). Manuscripts should be written in English of a sufficiently high standard that is intelligible to the professional reader who is not a specialist in the particular field. Where contributions are judged as acceptable for publication, the Editor or the Publisher reserve the right to modify the manuscripts to improve communication between author and reader. Authors whose native language is not English are strongly recommended to have their submissions checked by a person knowledgeable of the language. If extensive alterations are required, the manuscript will be returned to the author for revision.

Covering letter

The manuscript must be accompanied by a covering letter bearing the corresponding author's signature. Papers are accepted for publication in the Journal on the understanding that the content has not been published or is being considered for publication elsewhere. This must be stated in the covering letter. If authors submit manuscripts relating to original research in the field of education, the corresponding author must state that the protocol for the research project has been approved by a suitably constituted Ethics Committee and that it conforms to the provisions of the Declaration of Helsinki (as revised in Edinburgh 2000), available at **http://www.wma.net/e/policy/b3.htm**. All investigations involving human subjects must include a statement that the subject gave informed consent and patient anonymity should be preserved.

The covering letter must contain an acknowledgement that all authors have contributed significantly and that all authors are in agreement with the content of the manuscript.

Authors should declare any financial support or relationships that may give rise to a conflict of interest.

Submitting a manuscript

Manuscripts should be submitted by email to **(agnes@123doc.com)**. We do not accept manuscripts submitted by post. Corresponding authors must supply an email address as all correspondence will be by email. Authors should use double spacing when submitting their manuscript. Two files or documents should be supplied: the covering letter and manuscript. The covering letter should mention the title, authors, their contribution, provenance, journal section where their work is to be considered (see above) and any conflict of interests. Please supply the files in Word 2003 format.

Figures should be supplied as a separate file, with the figure number incorporated in the file name. High-resolution figures (at least 300 d.p.i.) saved as jpeg files should be submitted.

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Manuscript style

Unless otherwise stated manuscripts should follow the style of the Vancouver agreement detailed in the International Committee of Medical Journal Editors' revised "Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication", as presented at **http://www.ICMJE.org/**.

Abbreviations

Abbreviations should be used sparingly to facilitate reading the article by reducing repetition of long, technical terms. Initially you must use the word in full, followed by the abbreviation in parentheses. Thereafter use the abbreviation only.

Units

All measurements must be given in SI or SI-derived units.

Trade names

Drugs should be referred to by their generic names, rather than brand names.

References

All articles must be referenced appropriately. To reference the Journal please use the following abbreviation FYJ-123Doc. (The Vancouver system of referencing should be used and some examples are given below).

References should be cited using superscript Arabic numerals in the order in which they appear. If cited in tables or figure legends, number according to the first identification of the table or figure in the text.

In the reference list, the references should be numbered and listed in order of appearance in the text. Cite the names of all authors, when seven or more list the first three followed by et al. Names of journals should be abbreviated in the style used in Index *Medicus*. Reference to unpublished data and personal communications should appear in the text only.

References should be listed in the following forms:

Journal article

Vassallo M, Vignaraja R, Sharma JC, et al. The Impact of Changing Practice on fall Prevention in a Rehabilitative Hospital. The Hospital Injury Prevention (HIP) Study. *J Am Geriatr Soc 2004,* 52:335-9. Book Azeem T, Vassallo M, SamaniNJ. *Rapid review of ECG interpretation.* London UK: Manson Publishing 2005.

Chapter in a book

Martin GM. Biological mechanisms of ageing. In: *Grimley Evans J, Franklin Williams T eds. Oxford Textbook of Geriatric Medicine, 1st edn.* New York: Oxford University Press 1992, 41-48.

Journal article on the internet

British Geriatrics Society position paper. Dementia ethical issues **http://www.bgs.org.uk/Publications/Position%20Papers/psn_dementia_ethics.html**.

Tables

Tables should be self-contained and complement, but not duplicate, information contained in the text. Number tables consecutively in the text in Arabic numerals. Table should be double-spaced and vertical lines should not be used to separate columns. Column headings should be brief, with units of measurement in parentheses; all abbreviations must be defined in footnotes. Footnote symbols: †, ‡, §, should be used (in that order) and *, **, *** should be reserved for P-values. The table and its legend/footnotes should be understandable without reference to the text.

Line figures

Line figures should be sharp, black and white graphs or diagrams, drawn professionally or with a computer graphics package. Lettering must be included and should be sized to be no larger than the Journal text.

Colour figures

We encourage authors to submit colour figures and graphics that facilitate the comprehension of the article.

Figure Legends

Type figure legends on a separate page. Legends should be concise but comprehensive - the figure and its legend must be understandable without reference to the text. Include definitions of any symbols used and define/explain all abbreviations and units of measurement. The Journal accepts the following types of articles (as title please):

Case Based Discussion

These are mainly intended for inclusion in sections 1 and 5 as highlighted above and should be about 1000-1500 words long. The CBD can focus on various aspect of patient care such as presentation, treatment or prescribing. The articles should include areas that are evaluated in the case based discussion assessment tool of the foundation programme .

The manuscript should be set out in the following sections:

- Abstract: this should refer to salient points from the case being presented together with a mention of what aspects are being discussed.
- Case History: this relates to the initial presentation and should include the clinical setting, clinical problem, investigations and treatment. The history section should also include an ongoing update (e.g. 2 days later, a week later, etc) of patient progress and management.
- Discussion: this section should include a critical analysis of patient management in relation to clinical assessment, investigations, differential diagnosis, treatment, follow-up, professionalism and clinical judgement. The discussion should also include a discussion about the ongoing management issues and decisions. It is important to note that the case based discussion is not a review of a particular condition.
- Two best of 5 MCQs to be included in the Test Yourself section, with answers and detailed teaching notes explaining the answers. The answers only are NOT sufficient and it should be kept in mind when writing the teaching notes that the reader may take the test questions independently from reading the article.

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Authors writing a case based discussion should not write a short history and then write an article about the condition that the patient presented with. Such information can easily be obtained from a text book and is not the scope of Journal. Case based discusions written in this style will be returned to the author without being published.

Practical Procedures

Manuscripts on practical procedures should be about 1000–1500 words long. They should be set out in the following sections:

- History: this should describe the presentation of the patient and mention why or how the patient ended up needing the procedure.
- The procedure itself.

This should include:

- indications and contraindications
- explaining the procedure to the patient (including possible complications) and gaining informed consent for procedures
- preparing the required equipment, including a sterile field
- position the patient and give pre-medication/sedation or local anaesthesia as required and involving the anaesthetist where appropriate
- safely disposing of equipment, including sharps
- documenting the procedure, including labelling samples and giving instructions for monitoring and aftercare
- recording complications and the emergency management of such complications when appropriate.

Adequate pictures and diagrams need to be supplied in order to make the procedure as clear as possible.

Two best of 5 MCQs for inclusion in the test yourself section, including answers and detailed teaching notes. The answers only are NOT sufficient and it should be kept in mind when writing the teaching notes that the reader may take the test questions independently from reading the article.

Audit

Manuscripts, 1500–2000 words long, on audit are encouraged. The Journal will only publish high quality audit i.e. completed audit cycles or audits that have led to guideline development. Part 1 audits or surveys will not be accepted for publication.

Review Articles

We are interested in review articles on any aspect of the curriculum that is of relevance to our readership. They should be a maximum 3000 words long, 30 references, 250 word structured abstract, 4 tables OR figures.

We would consider reviews on any of the following:

- Good Medical Practice
- Teaching and Training
- Professionalism
- Medical reviews subject to prior discussion with the editorial team as to the appropriateness of the article

Shorter Reflective Practice Articles

We are always pleased to receive short pieces of a thoughtful nature that describes the personal or professional experiences of colleagues working with patients or their relatives. They should have a maximum of 1000 words. As suggested in the Foundation Programme Portfolio (Reflective Practice) these articles should describe:

- What made the experience memorable?
- How did it affect you?
- How did it affect the patient?
- How did it affect the team?
- What did you learn from the experience and what if anything would you do differently next time?

Some aspects to be considered in these articles are:
Communication with the patient, ethical issues, aspect of your works with colleagues, probity and honesty, personal health.

Research Papers

The Foundation Years Journal would welcome research articles on Medical Education. Other research papers would be considered if thought to be of interest to the readership of the Journal. Articles should be written using the following headings (title page, abstract, introduction, methods, results, discussion acknowledgements, references, tables, illustrations legends.). They should be of a maximum of 2500 words of text, plus abstract, 30 references, 3 tables or figures. Manuscripts including a structured abstracts should have a maximum of 250 words using the headings introduction, methods, results, conclusion. The title page should contain (i) the title of the paper; (ii) the full names of the authors; and (iii) the addresses of the institutions at which the work was carried out together with; (iv) the full postal and email address, plus facsimile and telephone numbers, of the author to whom correspondence about the manuscript should be sent.

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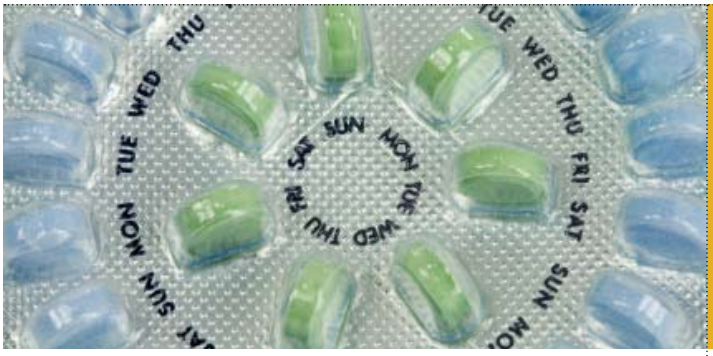
CONTRACEPTIVE METHODS

A Mahendru, J Putran and MA Khaled



Female methods of contraception include the contraceptive pill, the contraceptive patch, barrier methods, long acting reversible contraceptives, fertility awareness methods and female sterilisation.
Good Clinical Care.

Contraceptive methods

Several methods of contraception are available for both males and females. They may be reversible or irreversible. Female methods of contraception include the contraceptive pill, the contraceptive patch, barrier methods, long acting reversible contraceptives, fertility awareness methods and female sterilisation. Male methods of contraception include the male condom, coitus interruptus and vasectomy.

Detailed history and clinical assessment is needed before prescribing a contraceptive. The UK Medical Eligibility Criteria for Contraceptive Use (UKMEC) provides evidence-based recommendations to couples to select the most appropriate method of contraception (see Table1).

UKMEC 1	A condition in which there is no restriction on the use of the contraceptive method
UKMEC 2	A condition in which the advantages of using the method generally outweigh the theoretical or proven risks
UKMEC 3	A condition where the theoretical or proven risks usually outweigh the advantages of using the method
UKMEC 4	A condition which represents an unacceptable health risk if the contraception is used

Table 1: The UK Medical Eligibility Criteria for Contraceptive Use (UKMEC).

Failure rates vary depending on the type of contraception. The failure rates for some forms of contraception are also user dependant (see Table 2). Both method and user effectiveness is expressed as failure rates per 100 women years of exposure.

Method	Failure Rates
Male sterilisation	0–0.1
Female sterilisation	0–0.5
Implanon	0–0.07
Injectables (DMPA)	0–1
COCP	0.2–3
LNG-IUS	0–0.06
T-safe Cu380A	0.3–0.8
Male condom	2–15
Diaphragm	6–20
Coitus interruptus	4–19
Spermicides alone	4–25
Fertility awareness	2–20

Table 2: First year user failure rates per 100 women for different methods of contraception.

Male Contraception

Male methods of contraception include the male condom and coitus interruptus. Vasectomy is the permanent method of male contraception.

Condoms

These are expandable, tubular devices designed to cover the erect penis and physically prevent the transmission of semen into the vagina. They are traditionally made of vulcanised latex rubber.

Male condoms are effective in preventing pregnancy when used correctly. They also reduce the spread of sexually transmitted infections including HIV. Latex-free male condoms are available for those with latex allergy. Oil-based lubricants may damage the condoms and are not recommended. Concomitant use of spermicide, such as nonoxynol 9, can increase HIV transmission by causing damage to vaginal epithelium[1].

Coitus interruptus

This method involves withdrawal before ejaculation, ensuring that the semen is deposited outside the vagina. It has no adverse effect but some couples find intercourse incomplete and unsatisfying.

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Vasectomy

The male irreversible method of contraception can be performed under a local anaesthetic. A "no scalpel" technique, when used to identify the vas, reduces the rate of complications. Men are advised to use effective contraception until azoospermia is confirmed. Some men may complain of chronic testicular pain after vasectomy.

Female contraception

Female methods of contraception include the contraceptive pill, the contraceptive patch, barrier methods, long acting reversible contraceptives, fertility awareness methods and female sterilisation.

Combined oral contraceptive pill

The combined oral contraceptive pill (COCP) is one of the most common methods of reversible contraception used worldwide. Twenty-five per cent of women in the fertile age group in the UK use the COCP.

They consist of a combination of oestrogen and progestogen (see Table 3). Different types of pills have different doses of oestrogen. The type of progestogen varies depending on the preparation (e.g. levonorgestrol, norethisterone, desogestrel, gestodene, drospirenone and norgestimate).

Pill type	Preparation	Oestrogen (microgram)	Progestogen (microgram)
Monophasic	EE/norethisterone	20 or 30	500–1500
Monophasic	EE/levonorgestrel	30	150
Monophasic	EE/desogestrel	20 or 30	150
Monophasic	EE/gestodene	30	75
Monophasic	EE/norgestimate	35	250
Monophasic	EE/drospirenone	30	3000
Bi/triphasic	EE/norethisterone	35	500–1500
Bi/triphasic	EE/levonorgestrel	30–40	50–125
Bi/triphasic	EE/gestodene	30–40	50–100

Table 3: Common COCP Preparations (EE = Ethinylestradiol).

COCP act by inhibiting ovulation by suppressing the hypothalamic pituitary ovarian axis, suppressing the endometrium and thickening the cervical mucus. The first 7 pills inhibit ovulation and the other 14 maintain anovulation. Apart from being safe and effective, they provide non-contraceptive benefits by reducing menorrhagia and dysmenorrhoea. They also reduce rates of ovarian and endometrial cancer. Pills can be started up to the 5th day of the menstrual cycle without additional backup contraception[2]. COCP can also be started within 5 days of termination of pregnancy and on day 21 post-partum in non-breastfeeding mothers. Before prescribing COCP, a detailed history needs to be taken including that of medical conditions (past and present), medication use (prescription, non-prescription and herbal remedies) and family history (see Table 4).

Contraindication To COCP Use (UKMEC 3/4)	
Age >/=35 years, smoking <15 cigarettes per day or stopped smoking <1 year ago	Age >/=35 years, smoking >/=15 cigarettes per day
Obesity – BMI 35–39 kg/m2	Obesity – BMI >/=40 kg/m2
Multiple risk factors for arterial cardiovascular disease (older age, smoking, diabetes and hypertension)	Multiple risk factors for arterial cardiovascular disease (older age, smoking, diabetes and hypertension)
Hypertension – SBP >140–159mm Hg or DBP >90–94mm Hg	Hypertension – SBP >/=160mm Hg and/or DBP>/=95mm Hg
Family history of VTE in a first degree relative aged <45 years	Current VTE on anticoagulants or past history, known thrombogenic mutations
Immobility unrelated to surgery	Major surgery with prolonged immobilisation
Known hyperlipidaemia	Current and history of ischaemic heart disease/stroke/valvular and congenital heart disease
Migraine headaches – without aura and age>/=35 years, past history of migraine with aura at any age	Migraine headaches – with aura at any age
Breast disease – past history with no recurrence for 5 years; carriers of known gene mutations (e.g. BRCA1), undiagnosed mass	Current breast cancer
Diabetes – with nephropathy/ retinopathy, or other vascular disease or diabetes of >20years duration	Diabetes – with nephropathy/ retinopathy, neuropathy or other vascular disease, or diabetes of >20 years duration
Symptomatic medically treated or current, past COC-related cholestasis, mild compensated cirrhosis	Active viral hepatitis, severe decompensated disease, benign and malignant liver tumours
Enzyme inducing drugs: rifampicin, rifabutin, St John's wort, griseofulvin and anticonvulsants	Raynaud's disease, gestational trophoblastic neoplasia

Table 4: Contraindication to COCP use (UKMEC 3/4).

Progestogen only pill

The progestogen only pills (POP) act by thickening the cervical mucus. The pills have to be taken daily within 3 hours of an agreed time. A newer generation of POP, the cerazette (which contains desogestrel) also inhibits ovulation. Cerazette needs to be taken within 12 hours of an agreed time. They can be safely used while breastfeeding and by women with contraindications to the combined pill (see Table 5). The major drawback is an irregular bleeding pattern.

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UKMEC Category 3	UKMEC Category 4
Breast cancer in past 5 years	Current breast cancer within 5 years
Gestational trophoblastic neoplasia	
Active viral hepatitis/ severe decompensated cirrhosis/liver tumours/liver enzyme inducing medication	
Occurance of new symptoms or diagnosis of ischaemic heart disease, stroke, VTE or migraine with aura	

Table 5: Contraindications for use of POP.

Contraceptive patch

The norelgestromin/ethinyl oestradiol transdermal contraceptive system (Evra) is applied weekly for 3 weeks followed by a patch-free week. The contraindications are similar to that of the COCP.

Barrier

Before the introduction of hormonal and intrauterine contraception, female barrier methods (diaphragms and cervical caps) were a common method used by 1 in 8 couples in the UK.

Diaphragms and cervical caps used with a spermicide provide a physical and chemical barrier to sperm from reaching the cervix. The main advantages are there are no serious side effects, use is under the woman's control, and they need only be used during intercourse. They may provide some protection against sexually transmitted infections.

A contraceptive sponge impregnated with three types of spermicides, called Protectaid, is available in the UK. It can remain in situ for 12 hours.

Fertility awareness methods (FAM)

These include all methods based on identification of the fertile time in the female menstrual cycle. Once the fertile time in the menstrual cycle is identified, the couple can either abstain from intercourse (natural family planning method) or use a barrier method (fertility awareness combined method).

The fertile time in the menstrual cycle can be identified by observing the cervical secretions, measuring the basal body temperature, calculating from the length of the menstrual cycle or a combination of the above.

Personal hormone monitoring systems, computerised thermometers or saliva testing devices are also available.

Long Acting Reversible Contraception (LARC)

These are defined as methods that are administered at intervals of less than a month[3]. They consist of the progestogen-only intrauterine system (LNG-IUS), the intrauterine device (IUD), the progestogen-only subdermal implants (SDI) and progestogen-only injectables (POI). NICE have recommended the use of LARC methods to reduce rates of unplanned pregnancies. All LARC methods are more cost-effective than the COCP at the end of one year of use. The IUD is the most cost-effective and the POI the least. The SDI is more cost-effective than IUS for the first 3 years of use.

Progestogen-only injectable contraceptives: the two commonly available injectables are the depot medroxyprogesterone acetate (DMPA) and norethisterone oenanthate. The DMPA is more commonly used in the UK and is given at a dose of 150mg intramuscular every 12–13 weeks. They work by inhibiting ovulation and thickening the cervical mucus. The common drawback is an irregular bleeding pattern, delayed return of fertility and possible osteoporosis.

Progestogen-only subdermal implants: these implants work primarily by inhibiting ovulation. The Implanon consists of a single rod inserted into the upper arm. It releases etonogestrel and is effective for 3 years.

Progestogen-only intrauterine system (LNG-IUS): this is a hormone impregnated intrauterine device, which works by releasing levonorgestrel at a slow rate. They are effective for 5 years. In addition to their contraceptive effect, the LNG-IUS is licensed for use in the treatment of menorrhagia.

Intrauterine contraceptive device (IUD): the IUD has been in use since the early 20th century. In the UK about 4% of women use the IUD as a method of reversible contraception. The banded T IUD, such as T-Safe Cu 380A and TT380 Slimline, are the gold standard for IUDs. Other types include the Nova-T 380, Multiload Cu375, Flexi-T and Gyne-Fix. They are licensed for use between 5 and 10 years.

The IUD works by preventing fertilisation and preventing implantation. The main advantages are long-term use, low cost, suitable in women with a variety of medical conditions and very low failure rates. The main disadvantages are heavy periods, infection, chance of expulsion and uterine perforation.

Female sterilisation

One of the most effective methods of contraception, female sterilisation or tubal occlusion can be performed by the laparoscope or by minilaparotomy. The Filshie clip is commonly used for female sterilisation. Other methods include the use of Hulka clips, Fallope ring or the Pomeroy technique. Laparoscopic sterilisation can be done as a day case procedure under general anaesthetic.

Essure is a very effective method of outpatient hysteroscopic sterilisation.

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Emergency contraception (EC)

This is defined as a female method of contraception that aims to prevent pregnancy after intercourse and before implantation can occur following unprotected sexual intercourse or potential contraceptive failure. Three main methods of post-coital contraception are available:

1. The copper IUD can be inserted for up to 5 days of unprotected intercourse. It is almost 100% effective. Those with at least 380mm^2 of copper have the least failure rates. They should be offered as a first choice especially if the woman wishes to continue with IUD for long-term contraception. The LNG-IUS is not effective as an emergency contraceptive.

2. Levonorgestrel is given as a stat oral dose of 1.5mg within 72 hours of unprotected sexual intercourse and is 98.5% effective. It can be used more than once in a cycle if clinically indicated.

3. The combined contraceptive pill is given as 4 pills stat followed by another 4 pills 4 hours later. It has to be given within 72 hours and is 97% effective.

Contraception, young people and consent

Any competent young person irrespective of age can independently seek medical advice and give consent to medical treatment. Competency is understood as the patient's ability to understand the choices and the consequences (Fraser guidance). Parental consent for prescribing a contraceptive is not necessary. The duty of confidentiality owed to a person less than 16 years of age is the same as any other person.

Contraception in breastfeeding women

Sixty-nine per cent of women initiate breastfeeding in the UK but the incidence falls to 21% by 6 months post-partum[4]. Breastfeeding delays the return of ovulation but waiting until the onset of menstruation may put women at a risk of unplanned pregnancy. Several options are available for breastfeeding women (see Table 6).

Time Post-Partum	Method Suitable
Immediate post-partum	Lactational amenorrhoea method, IUD, condoms, spermicides, female sterilisation
Within 4 weeks	POP, SDI, emergency contraception
From 4 weeks	IUD, LNG-IUS
From 6 weeks	POI, COCP, diaphragms and caps, male and female sterilisation

Table 6: Contraception for breastfeeding women.

Case Scenarios

1. A 15-year-old girl presents to the family planning clinic for contraception. She suffers with epilepsy and is on carbamazepine. Her mum is not aware about her contraceptive needs. She also suffers from heavy and painful periods. There is no other medical history and no significant family history of thrombosis. She is otherwise fit and healthy with BMI of 40. She is not compliant in taking pills.

Discussion: assess competency for taking contraception and understanding of risks and benefits applying the Fraser guidance as she is only 15 years of age.

As she is on antiepileptic medication (UKMEC 3 for COCP) and her BMI is raised (UKMEC 4 for COCP), a progestogen only contraception would be better for her. She is not compliant in taking pills, injection Depo-Provera or the implanon is a better choice. Depo-Provera will help with her heavy periods as well. Use of condoms should also be recommended to prevent STI.

2. A 29-years-old female presents to the clinic for contraception. She has two children, both delivered by Caesarean section. She has past history of pulmonary embolism. She wants long-term or permanent contraception. She is otherwise fit and healthy with a normal body mass index. She came with her husband who is fit and healthy and is 38 years old.

Discussion: any of the long acting contraceptives can be prescribed for her. Female sterilisation is also an option. Her husband could be offered a vasectomy. Failure rates, risks and benefits need to be discussed thoroughly.

CONTRACEPTIVE METHODS

A Mahendru, J Putran and MA Khaled

Conclusion

Various methods of contraception are available. The most suitable method should be prescribed after taking into consideration the woman's choice and the presence of any risk factors. Most forms of contraception are available freely in any family planning centre across the UK.

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Several methods of contraception are available for both males and females. Good Clinical Care.

A GUIDE TO HISTORY AND EXAMINATION IN OBSTETRICS AND GYNAECOLOGY FOR FOUNDATION TRAINEES

Dr Prita Rughani and Mr Khaled Khaled

Knowledge of the basic history and examination skills in obstetrics and gynaecology is relevant to Foundation trainees, in particular, those who will be undertaking a rotation in this specialty, in accident and emergency or general practice as you will inevitably encounter women presenting with such conditions. Good Clinical Care.

Learning objectives

1. Learn the key features of taking a history in obstetrics and gynaecology.
2. Learn the essential components of examination in obstetrics and gynaecology.

Introduction

Knowledge of the basic history and examination skills in obstetrics and gynaecology is relevant to Foundation trainees, in particular, those who will be undertaking a rotation in this specialty, in accident and emergency or general practice as you will inevitably encounter women presenting with such conditions.

Gynaecological history

Always try to interview patients without other family members present, as this may well inhibit their responses to your questions. Good communication skills are essential to build a rapport with the patient and enable them to provide you with the required information from their history in order to form a diagnosis. Ensure a private and comfortable environment for the history taking, and an empathic approach as patients can often be quite distressed, in particular in the setting of the early pregnancy unit.

A common presenting complaint which will be encountered by Foundation doctors working in gynaecology is a suspected ectopic pregnancy. For example, a 24-year-old female presents to accident and emergency with sudden onset of right iliac fossa pain and per vaginal bleeding. An ectopic pregnancy should be suspected in any woman of childbearing age or sexually active woman who presents with abdominal pain or PV bleeding.

In addition to a detailed general history, there are some specific questions which need to be asked:

- Start with name, age, occupation.
- Elicit nature of the presenting complaint including duration and the impact it has upon her lifestyle:

- In particular, in an ectopic pregnancy, there is usually a sudden onset of abdominal pain, which tends to be at either the right or left iliac fossa. Radiation of the pain to the shoulder tip is indicative of diaphragmatic irritation due to a ruptured ectopic. The pain is usually initially dull in nature and may change to sharp and severe pain indicating possible rupture. Pain may be alleviated by adequate analgesia and is exacerbated by positions such as lying down, in particular if there is a ruptured ectopic.
- Symptoms of abdominal pain tend to precede any PV bleeding in an ectopic pregnancy.

- Menstrual history; age of menarche, length of cycle and regularity, duration of periods, age of menopause, last menstrual period.
- PV bleeding:

- Patients with an ectopic pregnancy usually present after around 8 weeks of amenorrhoea.
- Characteristically the PV loss is dark (like prune juice) or it may be fresh bleeding, and varies in volume from light to heavy bleeding.
- Passage of clots is rare and is more indicative of a loss of pregnancy.

A GUIDE TO HISTORY AND EXAMINATION IN OBSTETRICS AND GYNAECOLOGY FOR FOUNDATION TRAINEES

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- Also elicit history of any intermenstrual bleeding, post-coital bleeding, postmenopausal bleeding. Ask about menorrhagia (any clots, flooding), how many pads or tampons are required per day through the period. It is important to elicit any symptoms of dysmenorrhoea and the timing of this, for example, does it occur in the days leading up to the period, during or after the period. Also, does she experience premenstrual tension.
- Sexual history; are they sexually active, what was the age of first intercourse, any dyspareunia (pain on intercourse – deep inside or superficial, on penetration), type of intercourse, any travel abroad, history of sexually transmitted infections (gonorrhoea, chlamydia, herpes) in particular any history of pelvic inflammatory disease.

- The date of the last menstrual period and the nature of the period are essential in determining the likelihood of an ectopic pregnancy.

- Contraception; specific mode used such as barrier method, oral, Depo-Provera injection, intrauterine devices.
- Cervical smear history; last smear date? Any abnormal smear results? If so what action was taken? Have they ever been seen in a colposcopy clinic?
- Previous gynaecological surgery or problems.
- Family history; any malignancy of breast, reproductive tract or bowel? Age of menopause of mother/sister/grandmother.

- Any family history of ectopic pregnancy is significant.

- Urinary or prolapse questions; any urinary symptoms such as frequency, nocturia, urgency or enuresis? Does she ever leak urine? If so, how severe is it and with what is it associated, for example, coughing or urgency. Is there any dysuria or haematuria? Any symptoms of vaginal/uterine prolapse – ask her if she ever gets a dragging sensation or feels a mass within or at the vagina?
- Other; ask about any vaginal discharge (colour, consistency, quantity, whether offensive, timing with menstrual cycle), history of breast/thyroid problems, medications, such as use of hormone replacement therapy.
- Past obstetric history; ask about previous pregnancies in chronological order, and ask regarding the gestation, mode of delivery and weight of babies, as well as any complications of pregnancy.
- Past medical/surgical history; any previous surgery, especially gynaecological ones. Also ask directly about any history of diabetes, lung and heart disease, venous thrombosis, hypertension, jaundice, anaemia, etc.
- Review of systems; including cardiovascular, respiratory, gastrointestinal and neurological questions.
- Drug history; any regular medications and allergies.
- Family history; in particular of any cancers, diabetes, venous thromboembolism, heart disease or hypertension.
- Social history; does she smoke or drink alcohol? If so, quantify this. Is she married or in a relationship? Where does she live? How much support is there at home?

Obstetric history

A common presenting complaint when working as a Foundation doctor in obstetrics is PV bleeding in pregnancy and suspected miscarriage. In addition to a detailed general history, there are some specific questions which need to be asked:

- Elicit nature of presenting complaint and if admitted, the reasoning for this, such as pain, hypertension, antepartum haemorrhage, ruptured membranes.

- The main presenting symptoms of a miscarriage are PV bleeding which tends to precede any symptoms of abdominal pain.
- Elicit whether the pain/bleeding are comparable with that of a normal period or worse.
- Have they seen any products of conception or have any clots been passed?

- Gravida; total number of pregnancies including their current pregnancy, any miscarriages, terminations and stillbirths.
- Parity; the number of pregnancies which progressed beyond or equal to 20 weeks (including any stillbirths).
- Terminations and miscarriages; when, why and how these occurred, specifically at how many weeks of gestation.
- Last menstrual period (including length and regularity of menstrual cycle); length of gestation and estimated date of delivery according to the LMP.
- Any problems conceiving; history of subfertility, in-vitro fertilisation, artifical insemination.
- Symptoms during pregnancy so far; hyperemesis, PV bleeding/discharge, abdominal pain.
- Delivery history; gestation at which delivered, mode of delivery – normal vaginal deliveries, instrumental deliveries (forceps, ventouse). Any previous Caesarean sections – were they elective or emergency? What was the reasoning behind the decision for operative delivery? Birthweight and sex of any babies. Did the baby have to spend any time on the special care baby unit? Why?
- Complications of pregnancy; gestational diabetes, hypertension, pre-eclampsia, anaemia, bleeding, urine infections, concerns regarding foetal growth (any growth scans performed). Any hospital visits or admissions during the pregnancy?
- Mothers blood group; especially important if she has any bleeding in pregnancy, if she requires anti-D to minimise the risks of rhesus incompatibility with the baby.
- Past gynaecological history; any intermenstrual or post-coital bleeding. Date of the last cervical smear test and if she has ever had any abnormal results. Prior use of contraception and if any difficulties were encountered conceiving.
- Past medical/surgical history; any operations, heart disease, diabetes, hypertension, anaemia, jaundice, epilepsy.
- Review of systems; including cardiovascular, respiratory, gastrointestinal and neurological questions.

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- Drug history; any regular medications and allergies. Did she have pre-conceptual folic acid?
- Family history; any history of multiple pregnancies, hypertension, diabetes mellitus, pre-eclampsia, autoimmune disease, thrombophilia or any inherited disease.
- Social history; does she smoke or drink alcohol? If so, quantify this. Is she married or in a relationship? Where does she live? How much support is there at home?

Preparation and equipment required for gynaecological examination

Ensure a chaperone is present with you at all times of the examination. You need the following:

- Examination couch
- Non-sterile gloves
- Speculum (Cuscoe's)
- Cotton wool
- Normal saline
- Swabs (HVS, endocervical)
- Aqueous gel
- Tissue paper.

Gynaecological examination

There are three key components of examination in obstetrics and gynaecology.

1. Abdominal examination

Start with a general inspection for scars, striae, hernias, hair distribution, distended/tense abdomen and an everted umbilicus. Palpate for any tenderness or masses. Localised tenderness in the right or left iliac fossa can be a sign in an ectopic pregnancy. In particular any signs of peritonism, such as rebound or percussion tenderness, a rigid abdomen or if the patient is unable to lie flat due to the extent of the severity of pain. Percuss the abdomen to elicit any solid masses (for example, a full bladder) or any shifting dullness (free fluid). The uterus may be enlarged in an ectopic pregnancy. Auscultate for bowel sounds.

2. Per vaginal examination (digital bimanual examination)

Ensuring the patient's privacy, explain the examination in simple terms and gain their permission for it. A chaperone is essential at all times whether you are male or female. Ask the patient to lie flat with her knees bent and legs flopped apart. Start with an inspection of the vulva and vagina for any ulcers, lumps, discolouration, evidence of prolapse, discharge/bleeding, swelling, erythema. Palpate the cervix – texture, consistency, any lumps, size of the cervical os, and in particular for any cervical excitation which may be present in an ectopic pregnancy. Do a bimanual palpation of the uterus (place the left hand on the abdomen above the symphysis pubis and push down into the pelvis while gently inserting two fingers into the vagina, hence palpating the organs between your hand and your fingers) assessing for size, shape, consistency, regularity, mobility, tenderness, position (anteverted or retroverted).

Normally, the uterus feels similar in size and shape to a small pear. Feel in the regions of the adnexae, which are the areas lateral to the uterus on either side, containing the fallopian tube and ovary, for any tenderness or masses including their size and consistency if present. An adnexal mass may be representative of an ectopic pregnancy. Assess whether this mass is separate from the uterus. The area behind the cervix is the pouch of Douglas within which you may be able to feel the uterosacral ligaments, which should be assessed for their consistency and any tenderness as well as any associated masses.

3. Speculum examination

Ask the woman to lie flat on the examination couch (supine position), with her knees bent and flopped apart, keeping her ankles together. Warn her before starting the examination, and firstly inspect the vulva and vagina before inserting the speculum. With the Cuscoe's speculum (warm it under a running tap prior to starting), gently insert it with the blades closed and parallel to the labia with the opening mechanism pointing to the patient's right side. Rotate it 90 degrees as you enter the vagina and then open it up once you feel you have reached the cervix. Open it up under direct vision and when the cervix is visualised, you can secure the speculum in the open position. Assess the cervix for any ulceration, bleeding, cysts, irregularities and the cervical os (open in multiparous women), take any swabs which are required and you can do a cervical smear if it is due for the woman. Then, slowly withdraw the speculum keeping it under direct vision and inspecting the vaginal walls as you do. Then close it and remove it ensuring minimal discomfort to the patient.

In a case of bleeding in pregnancy, it is important to determine if the cervical os is open, and if there are any lesions at the cervix which may be responsible for the PV bleeding. If the cervical os is open it is known as an inevitable miscarriage and if the os is closed it is a threatened miscarriage. Once the cervical canal is visualised, if any products of conception or clots are visualised, these should be removed with sponge forceps.

A Sims speculum is specifically used to inspect the vaginal walls and examine for any prolapse. The woman needs to be positioned as for a rectal examination, so in the left lateral position, with knees bent upwards towards the chest. The speculum is inserted into the vagina from behind and used to pull back each vaginal wall in turn to allow examination of both the anterior and posterior walls. The patient can be asked to bear down in order to further assess for prolapse.

Preparation and equipment required for obstetric examination

- Examination couch
- Pinard's stethoscope or Doppler probe

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Abdominal examination in pregnancy

- General appearance of patient; weight, height, temperature, pulse, blood pressure, any peripheral oedema, pallor or jaundice. Urinalysis is usually performed as well.
- Ask the patient to lie as flat as is comfortable for her. Expose her from below the breast to the symphysis pubis.
- Inspection; look for any striae, linea nigra, signs of venous distension, scars (previous Caesarean section or gynaecological surgery) and foetal movements which may be present in late pregnancy.
- The uterus should be palpable from around 12 weeks and the fundus is usually at the umbilical level by around 20 weeks. The fundus should be palpated using the fingers and ulnar border of the left hand.

- Determine if the uterine size is appropriate for dates especially in a suspected miscarriage.

- Measure the fundal height in cm from the top of the fundus to the symphysis pubis (this should approximately be 36cm at 36 weeks for example, however, 2cm either way is acceptable up to 35-weeks gestation, and up to 4cm after 35 weeks).
- Using both hands, palpate down the abdomen following the foetus towards the pelvis. Try to palpate the foetal parts, for example, the head is hard and if free can be balloted between your hands.
- Assess for the foetal lie (relationships between the long axis of the uterus and the foetal position) after 24 weeks. If the head/breech is felt over the pelvic inlet this is a longitudinal lie and if either is felt in the iliac fossa then it is an oblique lie, and if the foetus is felt to lie horizontally it is a transverse lie.
- Determine the presentation and degree of engagement of the foetal presenting part. Pawlik's grip is used – this is when both hands are used to palpate over the lower uterine pole pressing firmly down just above the symphysis pubis to determine which foetal part occupies the lower segment or pelvis. To assess engagement, for example, if only two-fifths of the foetal presenting part, such as the head, is palpable in the pelvis, the foetus is said to be engaged.
- Auscultate; listen over the anterior shoulder of the foetus (around the area between the foetal head and abdomen) using a Pinard's stethoscope. Press it flat over the patients abdomen in this position and listen with your ear using a hands-free technique – the normal rate is 110–160 beats per minute.
- Others; it may be required to examine the patients fundi, reflexes, epigastrium, legs/ankles, heart and lungs if it is clinically indicated from their history.

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ANTENATAL CARE

B Muir and Mr Kaled

Routine antenatal care is offered to all pregnant women in the UK. It ensures that all women receive a basic standard of information and care during their pregnancy and labour. This enables women to make informed decisions about their care and treatment, in partnership with health care professionals. Good Clinical Care.

Learning objectives

- aims of antenatal care
- what happens at the booking visit
- routine maternal and foetal tests
- lifestyle advice
- provision of care for maternity services.

Introduction

Routine antenatal care is offered to all pregnant women in the UK. It ensures that all women receive a basic standard of information and care during their pregnancy and labour. This enables women to make informed decisions about their care and treatment, in partnership with health care professionals. Ideally women should see their GP for pre-conception counselling. Midwives and GPs carry out routine antenatal care for the majority of women; some women require extra monitoring and therefore benefit from obstetrician-led care. Antenatal appointments can take place at home, midwife-led units, GP surgeries or hospital and they should be in an environment where the mother and partner feel supported and enabled to ask questions.

Aims of antenatal care

- Identify and manage pre-existing maternal disorders that may affect the pregnancy.
- Prevent or manage maternal or foetal complications of pregnancy.
- Detect congenital foetal problems if requested by the mother.
- Plan for labour and ensure maximum safety and satisfaction.
- Educate and advise about lifestyle and common conditions in pregnancy.

Statistics

There were 690,013 live births in England and Wales in 2007. There were 3,598 stillbirths in England and Wales in 2007. The mean age of mothers in 2007 has increased to 29.5 years. In 2006 the total number of conceptions for women of all ages was 870,000.

Antenatal visits

The pattern of recommended visits is as follows: booking visit ideally by 10 weeks (the earlier the better so that screening for haemoglobinopathy can be performed by 8 weeks), then at 16, 18–20, 25, 28, 31, 34, 36, 38, 40 and 41 weeks.

Pre-conception counselling is usually offered by GPs for women who seek out this information. It is essential for women who suffer from chronic medical conditions, such as diabetes (increased risk of macrosomic babies and therefore difficult labour) and epilepsy (increased risk of neural tube defects if on antiepileptic medication), and is also of benefit to women who have had traumatic previous pregnancies/conceptual difficulties. Discussion of the benefits of pre-conception folic acid supplements for 3 months prior to conception, lifestyle advice (e.g. smoking cessation) and advice on food hygiene is important. Family history of inherited disorders should be an important alert as some screening (e.g. cystic fibrosis carrier status) may be undertaken before pregnancy. Most women go to see their GP when they have had a positive pregnancy test and the GP starts the process of referral to midwifery services. Direct access to midwifery services is also available.

Booking visit

This enables health care professionals to identify high-risk women through history and examination and helps predict problems with pregnancy and birth so that actions can be taken to avoid/treat them. It is an opportunity to discuss screening tests for the mother and the foetus and lifestyle considerations are discussed (e.g. smoking cessation, drugs and alcohol) and information on diet and foods to avoid during pregnancy. It is an opportunity to discuss pregnancy care services and options available for monitoring and place of birth (e.g. home birth, birth in midwife-led units or hospital). NICE recommends that the booking visit is performed by 10 weeks, however, booking as early as possible is helpful as screening for haemoglobinopathy should be performed at 8 weeks to allow time for chorionic villus sampling by 13 weeks, if the couple so wish.

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History and examination

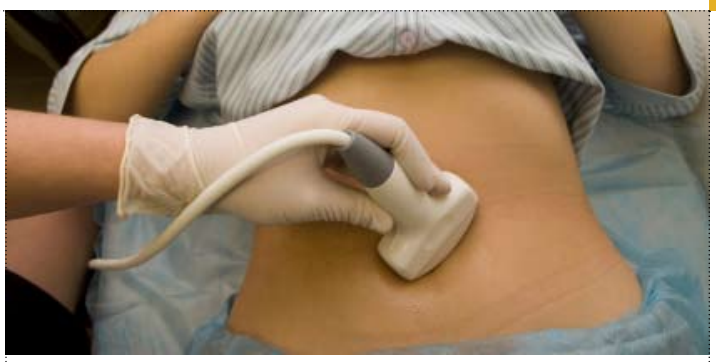
Pregnancy and childbirth are physiological processes and most women are healthy, therefore do not need a lot of monitoring. A thorough history and examination enables identification of those who will need extra monitoring during their pregnancy and birth. The history should include identification details, social history, gynaecology history, past obstetric history, medical conditions and medication history, factors associated with genetic risk, general condition and a family origin questionnaire should be filled in.

The following conditions require additional care and therefore monitoring with an obstetrician as they affect, or are affected, by pregnancy to a greater or lesser extent:

1. Cardiac problems and hypertension
2. Renal problems
3. Liver problems
4. Endocrine disorders and diabetes mellitus
5. Psychiatric conditions requiring medication
6. Haematological conditions (e.g. sickle cell, thalassaemia, thromboembolic problems)
7. Epilepsy on anticonvulsants
8. Malignancy
9. Severe asthma
10. Drugs (e.g. heroin, cocaine, ecstasy users)
11. HIV/hepatitis B
12. Cystic fibrosis
13. Autoimmune disorders (e.g. SLE)
14. Obesity
15. Older women (age >35) – high risk of complications
16. Smokers – risk of IUGR, PET
17. Vulnerable women (e.g. age <18 years, poor social support)
18. Family history of genetic disorders
19. Multiple pregnancy

In addition, women who have experience of the following conditions in previous pregnancies also require additional care with an obstetrician:

1. >3 Miscarriages or a mid-trimester loss
2. Severe pre-eclampsia, eclampsia or HELLP syndrome
3. Rhesus isoimmunization or unusual blood group antibodies
4. Uterine surgery (lower segment caesarean section, myomectomy, cone biopsy cervix)
5. Antepartum haemorrhage, post-partum haemorrhage more than twice
6. Retained placenta more than twice
7. Puerperal pyschosis
8. Grand multiparity (>6 pregnancies)
9. Stillbirth/neonatal death
10. Small for gestational age (<5th centile)
11. Large for gestational age (>95th centile)
12. Baby weight <2500g or >4500g
13. Congenital abnormality in baby (structural or chromosomal)[1]



Examination involves blood pressure check, height, weight, cardiovascular and respiratory system, and urine testing. Breast examination is no longer routinely performed. Abdominal examination is performed at later antenatal visits.

Asymptomatic bacteriuria occurs in 2–5% of pregnant women in the UK. There is an increased risk between asymptomatic bacteriuria and pyelonephritis among untreated women compared with women without bacteriuria. A systematic review of 14 RCTs compared antibiotic treatment with no treatment or placebo. Antibiotic treatment reduced persistent bacteriuria during pregnancy, reduced the risk of development of pyelonephritis and the incidence of low birthweight babies1.

Investigations and screening tests

Blood tests routinely performed at the booking visit are:

- Full blood count
- Blood group and antibody screen (not tested before 10 weeks)
- Serology for hepatitis B, syphilis, HIV, rubella
- Screening for haemoglobinopathies in at-risk groups at 8 weeks if possible
- Down's screening combined test: nuchal fold thickness, PAPP-A, ß HCG between 11–13 weeks + 6 days
- Triple/quadruple test for Down's at 16–20 weeks

FBC

The most common cause of anaemia in pregnancy is iron deficiency. Haemoglobin levels vary depending upon the time of gestation; the normal range of haemoglobin in pregnant women up to 12 weeks should be at, or above, 11g/100ml and 10.5g/100ml at 28 to 30 weeks of gestation. Maternal iron requirements increase in pregnancy because of the requirements of the foetus and placenta, and the increase in maternal red cell mass. Increased risks of poor foetal outcome are associated with particularly low and very high levels of haemoglobin[1].

ANTENATAL CARE

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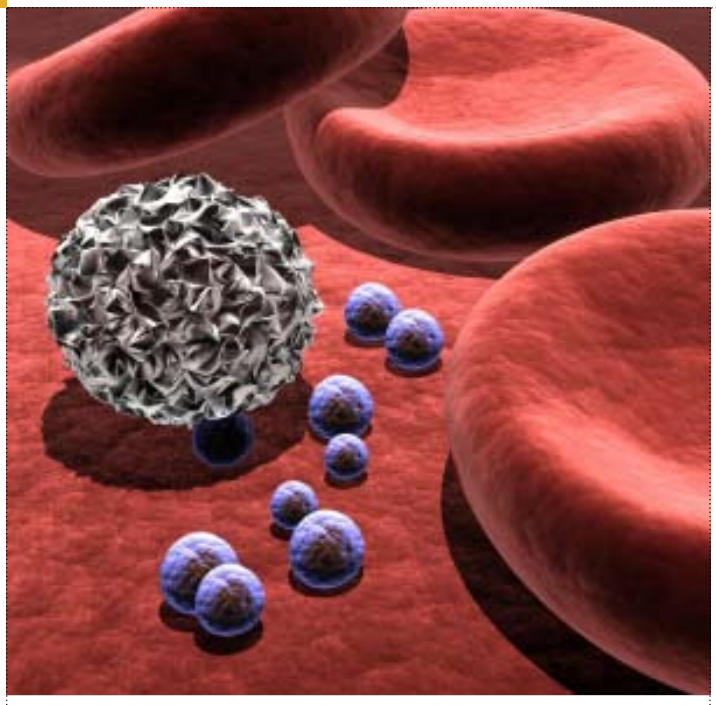


Blood group / antibody screening

Blood group and antibody screening, in particular Rhesus D status, helps to identify possible transfusion problems for the mother and to prevent haemolytic disease of the newborn (HDN) which may cause jaundice, severe anaemia, heart failure and death in the foetus. Fifteen per cent of women are RhD negative. RhD negative women can be offered appropriate antenatal and post-natal immunoprophylaxis with the aim of preventing RhD alloimmunisation in subsequent pregnancies. "Guidance on the routine administration of antenatal anti-D prophylaxis for Rhesus D negative women has been recently issued, which recommends that anti-D is offered to all pregnant women who are Rhesus D negative. However, in the case where a woman is Rhesus D negative, consideration should also be given to offering partner testing because, if the biological father of the foetus is negative as well, anti-D prophylaxis, which is a blood product, will not need to be administered[1]."

Screening for maternal infections

Hepatitis B virus affects the liver and can result in a chronic carrier state. The end result is cirrohsis or hepatocellular carcinoma. The prevalence of hepatitis B surface antigen (HBsAg) in pregnant women in the UK is 0.5–1%. Approximately 21% of hepatitis B viral infections reported in England and Wales among children under the age of 15 years is due to mother-to-child transmission and is approximately 95% preventable through administration of vaccine and immunoglobulin to the baby at birth. To prevent this, all pregnant women who are carriers of hepatitis B virus need to be identified.

HIV begins with an asymptomatic stage and can progress to AIDS. The prevalence of HIV infection in pregnant women in London, in 2001, was about 1:286 (0.35%). Elsewhere in England, the prevalence of HIV infection is reported to be around 1:2256 (0.044%). There is a risk of maternal death and infant mortality. In the absence of intervention, mother-to-child transmission was reported to occur in 25.5% of deliveries and was reduced to 8% with antiretroviral treatment with zidovudine. The combination of antiretroviral therapy (HAART), caesarean section and avoidance of breastfeeding can further reduce the risk of transmission to 1%.

Rubella can result in major congenital defects, such as congenital heart disease, cataracts in the neonate and sensorineural deafness. There is no treatment to prevent or reduce mother-to-child transmission of rubella for the current pregnancy. Detection of susceptibility during pregnancy, however, enables post-partum vaccination to occur to protect future pregnancies.

Syphilis is a sexually acquired infection caused by *Treponema pallidum*. The incidence in England and Wales is low, but four outbreaks of infectious syphilis occurred from 1997 to 2000. The prevalence of syphilis in pregnant women as estimated by reports from genitourinary medicine clinics in England and Wales was 0.068/1000 live births from 1994 to 1997. Mother-to-child transmission of syphilis in pregnancy is associated with neonatal death, congenital syphilis (which may cause long-term disability), stillbirth and preterm birth. "Because syphilis is a rare condition in the UK and a positive result does not necessarily mean that a woman has syphilis, clear paths of referral for the management of pregnant women testing positive for syphilis should be established[1]."

Haemoglobinopathies

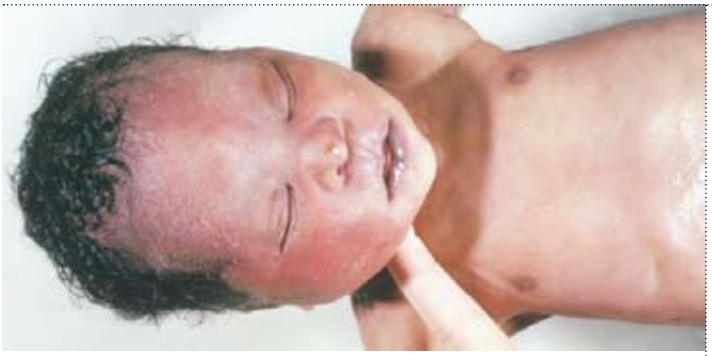
The aim of antenatal testing for haemoglobin disorders is to inform parents and provide them with the option of pregnancy termination at an early stage of pregnancy if their child has a serious haemoglobin disorder. The NHS Sickle Cell and Thalassaemia Screening Programme is a linked programme of newborn screening for sickle cell disease and antenatal screening for both sickle cell and thalassaemia diseases in England, ideally by 8 weeks (national screening guidelines).

Ultrasound scanning (USS)

First trimester (weeks 11–13 of 40) ultrasound scanning has been used by health care professionals to assess viability, gestational age, diagnose multiple pregnancy and as a part of the screening programme for Down's syndrome. USS is repeated between 18 weeks and 20 weeks + 6 days to check for foetal anomalies. "Detection of foetal anomalies on antenatal ultrasound offers women and their partners information that may help them better prepare for the birth of their child, the option of delivery in a setting that will permit rapid access to specialist surgical or medical care, and the possibility of considering pregnancy termination or palliative care in the newborn period[1]." Further screening may be performed when clinically indicated.

ANTENATAL CARE

B Muir and Mr Kaled



Screening for down's syndrome

The birth incidence of Down's syndrome in England and Wales was 1.1 per 1,000 live births in 2005 (National Down's syndrome register) and is maternal age-related varying from 1:1800 at age 20 to 1:100 at age 40. It arises due to inheritance of an extra copy of chromosome 21 resulting in learning disability and delayed developmental milestones, increased incidence of congenital malformations (particularly cardiac and gastrointestinal anomalies) as well as an increased incidence of thyroid disorders, childhood leukaemia and hearing, ophthalmic and respiratory problems.

All pregnant women are offered screening for Down's syndrome by the end of the first trimester (13 weeks + 6 days) and provision is made to allow later screening (which could be as late as 20 weeks). Between 11 weeks and 13 weeks + 6 days women are offered the "combined test": nuchal translucency by USS scan, beta human chorionic gonadotrophin (ß HCG) and Pregnancy Associated Plasma Protein A (PAPP-A) by testing maternal serum. Women who book later in pregnancy or when it is not possible to measure nuchal translucency, owing to foetal position or raised body mass index are offered triple or quadruple testing (hCG, uE3, AFP, inhibin A) between 15 weeks and 20 weeks. Information about Down's syndrome screening is given at the booking visit to enable further education and discussion about the test and its results.

The chance of the foetus having Down's syndrome is calculated taking into account the blood screening results, maternal age, weight, ethnicity, gestation and smoking status. Results are classified as either "screen positive" if the chance is equal to or greater than a nationally agreed cut-off level of 1:250. A "screen negative" result is if the chance is less than 1:250. When a screening result is positive the woman is offered a diagnostic test, either chorionic villus sampling (following a first trimester screening test) or amniocentesis (following a second trimester screening test) and this is performed by an obstetrician with a special interest in foetal medicine. Invasive diagnostic testing is the gold standard test for confirming the diagnosis but is associated with an excess risk of foetal loss of approximately 1% compared with no invasive testing and women should be made aware of this risk.

Lifestyle and general advice

Nutritional supplements recommended are folic acid to prevent neural tube defects (anencephaly, spina bifida, encephalocele) at a dose of 400mcg/day to 12 weeks. Vitamin D supplements are recommended at a dose of 10mcg/day as it is essential for skeletal growth and bone health. Vitamin D deficiency can occur when the demand exceeds supply, as in period of rapid growth in foetal life, infancy, early childhood and puberty, and during pregnancy and lactation. Vitamin D is synthesised in the skin by exposure to sunlight (90%) and 10% is acquired through diet (oily fish, fortified margarines and some breakfast cereals, as well as smaller amounts in red meat and egg yolk).

Studies have shown significant associations between maternal cigarette smoking in pregnancy and increased risks of perinatal mortality, sudden infant death syndrome, placental abruption, preterm premature rupture of membranes, ectopic pregnancies, placenta praevia, preterm delivery, miscarriage, low birth weight and the development of cleft lip and cleft palate in children. Discussion about the risks of smoking to the unborn child and the hazards of exposure to second-hand smoke is essential and allows us to address any concerns about stopping smoking.

If travelling abroad in pregnancy, the woman should consult with her doctor and travel health clinic to get advice about precautions for infections, vaccination advice (some vaccines, e.g. live/inactivated vaccines are contraindicated in pregnancy). It is important to have adequate travel insurance when pregnant. The overall incidence of symptomatic venous thrombosis after a long haul flight has been estimated to be around 1:400 to 1:10,000 and this risk can be further increased with pregnancy.

Exercise during pregnancy is encouraged but should be tailored to the pregnant woman and should involve pelvic floor exercises. Information is also given about antenatal classes, breastfeeding and its benefits are discussed. It is important to discuss mental health issues and identify those women who need extra support so early referral to a counsellor can be made.

Common Symptoms In Pregnancy
Nausea and vomiting
Heartburn
Constipation
Haemorrhoids are swollen veins around the anus that are characterised by anorectal bleeding, anal pain and anal itching
Varicose veins
Vaginal discharge – increased volume is normal in pregnancy due to changes in the vaginal ph and cervical mucus
Backache
Symphysis pubis dysfunction
Carpal tunnel syndrome

Table 1: Common symptoms in pregnancy.

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Shared care

Several studies have evaluated the difference between midwife care, midwife and GP-led care and obstetrician-led shared care. They found no difference between the observed groups in premature birth, Caesarean section rates, anaemia, UTIs, antepartum haemorrhage and perinatal mortality. There was no significant difference in levels of satisfaction between the groups. NICE guidance 2008 states "Midwife and GP-led models of care should be offered for all women with uncomplicated pregnancy. Routine involvement of an obstetrician in the care of uncomplicated pregnancy at scheduled times does not improve perinatal outcomes compared with involving and an obstetrician when complications arise."

One systematic review assessed the clinical effectiveness of continuity of care during pregnancy and childbirth and the post-natal period with routine care by multiple caregivers. Two trials, one set in the UK, the other in Australia, were included in the review. They randomised 1,815 women to continuity of care by a small group of midwives as well as consultation with an obstetrician compared with routine care provided by physicians and midwives. Women who had continuity of care by a team of midwives were less likely to:

- experience clinic waiting times greater than 15 minutes (Peto OR 0.14, 95% CI 0.10 to 0.19)
- be admitted to hospital antenatally (Peto OR 0.79, 95% CI 0.64 to 0.97)
- fail to attend antenatal classes (Peto OR 0.58, 95% CI 0.41 to 0.81)
- be unable to discuss worries in pregnancy (Peto OR 0.72, 95% CI 0.56 to 0.92)
- not feel well prepared for labour (Peto OR 0.64, 95% CI 0.48 to 0.86)

There was no significant difference in the rates of Caesarean section, induction of labour, stillbirth and neonatal death, preterm birth, admission to the neonatal unit or birth weight less than 2500g[1].

Several studies have shown that continuity of care provided by a small team provides better maternal satisfaction but does not significantly affect the outcome of pregnancy or birth. Maternity care should be readily and easily accessible to all women and should meet the needs of the local community. In the UK, women are given standardised, structured maternity notes which they carry which helps facilitate communication between all health care professionals involved.

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Further Reading

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MEDICAL PROBLEMS IN PREGNANCY, ESSENTIAL LEARNING POINTS

A Kamel and M A Khaled

The majority of women who become pregnant are healthy and remain so throughout their pregnancy. However, a number of women present with either pre-existing or new medical disorders that might affect their pregnancy. This article focuses - in points - on how to identify and manage common medical problems in pregnancy. Good Clinical Care.

Hyperemesis gravidarum

An 8-weeks pregnant woman in her first pregnancy was admitted via A&E complaining of severe repeated vomiting for the last 4 days. She looks tired, with a pulse of 100 beats per minute, blood pressure of 90/60 and a temperature of 36.8. When you are asked by the nursing staff to review and assess her condition, always remember that nausea and vomiting occur in 50–80% of first trimester pregnancies.

History: it is essential to identify any urinary or gastrointestinal tract symptoms as urinary tract infection (UTI) and gastroenteritis are among the possible differential diagnosis. In case of severe abdominal pain, pancreatitis and peptic ulceration should be excluded. Pay attention to fluid intake and estimated urine output.

Examination: mainly to assess the degree of dehydration and weight loss. Obtain urine sample for ketones (dehydration) and protein (UTI). Abdominal examination for fundal level (more than one period of amenorrhoea can suggest twin or molar pregnancy).

Investigation: check urea and electrolytes (raised urea is indicative of dehydration), full blood count (for haematocrit and leucocytosis) and send MSU. If prolonged, check liver function tests (LFT) (decreased albumen, increased transaminases) and thyroid function tests (TFT). Consider ultrasound (to exclude multiple pregnancy or hydatiform mole).

Complications: unlikely on foetus but maternal might include: dehydration, electrolyte disturbance, vitamin B deficiency (polyneuropathy) and Mallory-Weiss syndrome. Rarely it may lead to renal failure and liver failure as Wernicke's encephalopathy.

Treatment: mainly supportive: admission, psychological support, reassurance and encouragement.

IV fluid: Hartmann and normal saline are usually used. KCl if needed. Input/output fluid chart, weekly assessment of weight loss in prolonged cases. It is also important to restore electrolyte imbalance as well as normal LFT (abnormal LFT is usually due to dehydration and malnutrition). Frequent small carbohydrate snacks (input from nutritionist might be beneficial). Consider psychological support. If not settled, anti-emetics can be used. Dopamine antagonist (metoclopramide hydrochloride 10mg IM/IV TID), phenothiazines (stemetil 10mg TDS), or antihistamine (cyclizine 50mg TDS). Vitamin supplement: pyridoxine (B6) decreases the nausea. H2 receptor antagonist can be used to prevent acid peptic ulcer. Usually settles after 12 weeks. In prolonged and severe cases, a trial of steroids may prove to be beneficial. Consider total parenteral nutrition (TPN) if patient has lost more than 10% of her weight. Termination of pregnancy can be considered in severe uncontrolled cases with hepatorenal failure.

Pre-eclampsia

While you are in the labour ward you were asked to review a woman who is currently 34 weeks into her first pregnancy. She is generally feeling unwell, with moderate headache. Her pulse was 80 beats per minute, blood pressure 160/100 and temperature of 36.6. She noticed increasing swelling in her legs in the last few days and a urine dipstick analysis revealed 2 pluses of proteins in her urine. Given this history you should start thinking about pre-eclampsia.

It is defined as hypertension after 20 weeks with proteinuria. It is the second leading cause of maternal mortality in the UK. Take history for symptoms of headache, visual disturbance, epigastric pain and vomiting which may indicate a severe condition. Examine for oedema, hyper-reflexia and optic fundoscopy.

The definitive treatment is delivery but this may need to be delayed in balancing prematurity against maternal risk. Admission is mandatory for blood pressure monitoring.

Investigations will include:

1. 24-hour urine collection
   (for total protein, creatinine clearance and catecholamines).
2. FBC (low platelet, increased haematocrit), and group and save.
3. Clotting screen.
4. LFT, U&Es, urate
   (increased urate, increased liver enzymes indicate severe disease).

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Foetal Monitoring:

1. Ultrasound, doppler, cardiotocography (CTG).
2. Corticosteroids for those less than 36 weeks.

Antihypertensive: when systolic >170, or diastolic >120 or MAP >125. Aim to reduce it to around 130–140/90–100mm Hg. Alpha-methyl dopa is the most popular (maximum dose of 4gm/24hours).

Delivery: vaginal delivery; if cervix is favourable. One to one midwifery care. Caesarean section: if foetal compromise, cervix not favourable, failed induction of labour (IOL). Consider thromboprophylaxis.

Shortly after you finished examining the previous mention woman establishing the diagnosis and her management, she started to look drowsy and all of a sudden she started fitting in the bed.

You should realize that this is one of the worst complications of pre-eclampsia which is potentially life-threatening. Now you are facing one of the acute obstetric emergencies, however, you should be able to manage it! Always remember to seek help from other medical staff as soon as possible.

Eclampsia

Occurs in 49:10,000 maternities. Case fatality 1.8%, yet 35% would have at least one major complication. Forty per cent occurs post-natally, 38% antepartum and intrapartum 18%.

Management: left lateral position, secure airway + O2 (15 litre/min). MgSO4: Intravenous 4gm over 10–15 minutes then 1gm/hour (infusion pump) until within 24 hours of delivery or last fit. 2gm loading if any new fit.

Monitor: deep tendon reflex (patellar reflex), respiratory rate more than 16/min, urinary output more than 25ml/hr (should be done hourly), MgSO4 therapeutic level is 2–4 mmol/L. Antidote is 10ml (1mg) of 10% calcium gluconate over 10 minutes.

Treatment of hypertension: (BP >160/110 or MAP >125); be aware that oscillometric devices may underestimate blood pressure. Hydralazine 5mg slow IV per 20 minutes for the first hour. If there is no effect, consider infusing 2mg/hr, increasing by 0.5mg/hr as required. Give labetalol 50mg IV slowly, repeat if necessary after 20 minutes or infusion of 200mg in 200ml normal saline, starting at 40mg/hr increasing dose at half hourly intervals to a maximum of 160mg/hr. Nifedipine 10mg oral (as effective as sublingual). Its usage is by the consultant's decision (interaction with MgSO4 causing profound muscle weakness, maternal hypotension and foetal distress).

Fluid therapy: fluid maintenance should be restricted to crystalloid 85ml/hr. Iatrogenic fluid overload is a significant cause of maternal morbidity in severe pre-eclampsia and eclampsia.

Delivery: after stabilisation, mostly by Caesarean section, with referral to a high dependency unit for at least the first 24 hours after delivery.

You are in the antenatal clinic, when you this pregnant woman. She is 35 years old in her second pregnancy. She is currently 22-weeks pregnant. Her first delivery was normal vaginal birth but with a 4.6kg baby. She gives you a vague history about having diabetes in her first pregnancy. How would you approach the management of her condition?

Diabetes mellitus (DM)

Definitions: impaired glucose tolerance: abnormal glucose tolerance test (GTT) without the threshold for the diagnosis of DM reached. Gestational DM: intolerance which arises during pregnancy and disappears after delivery. Established diabetes: exits prior to pregnancy.

Screening: personal and family history of DM, impaired glucose tolerance, macrosomic babies and polyhydramnios. Risk factors: body mass index more than 30, polyhydramnios, large birth weight infants >4500, previous unexplained stillbirth, foetal macrosomia.

Screening test: fasting blood glucose with a threshold of 4.8mmol/L. Sensitive 80% and 76% specificity. Random blood sugar is widely used yet low sensitivity of 40%.

Diagnostic test: GTT at 24 weeks for high-risk factors (diabetes: if fasting >7.8mmol/L and 2 hours after meal >11mmol/L).

Preconception counselling: involvement of both partners. A joint approach between endocrinologist and obstetrician consultation.

Tight Control Is Important:

1. Hyperglycaemia deteriorates retinopathy and nephropathy.
2. Increase risk of foetal abnormality (congenital heart disease, skeletal and neural tube defects. Sacral agenesis is rare yet pathognomnic) and macrosomia.
3. Increased risk of preterm labour in case of maternal and foetal complications.

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Advise:

1. Tight control of DM is required, glycosylated Hb is an important indicator (patients with level <8 have a 5% chance of giving birth to a child with congenital abnormality, if the level is >10, this risk rises to 25%).
2. General advice on taking folic acid, rubella check, stop smoking, weight reduction in case of obesity.
3. Fundoscopy, renal function tests.

Antenatal care: multidisciplinary management (including anaesthetist, dietician, paediatrician, special care baby unit (SCBU) available), consultant-led care.

Foetal care:

1. Early dating scan and confirmation of gestation (high risk of abortion).
2. Detailed anomaly and cardiac echo ultrasound.
3. Serial ultrasound (risk of intrauterine growth restriction (IUGR), macrosomia, polyhydramnios).

Maternal care:

1. Fundoscopy every 3 months.
2. Regular glucose monitoring, insulin levels, diet.
3. Screening for pre-eclampsia, polyhydramnios, UTI.

Well-controlled cases are allowed to go to term but not past term (fear of sudden foetal death).

Intrapartum

If vaginal delivery is achievable:

1. Insulin sliding scale and avoid intrapartum hypo-hyper glycaemia.
2. Continuous CTG, electrolytes.
3. Epidural can be used if needed.
4. Paediatrician to attend the delivery.

Complications

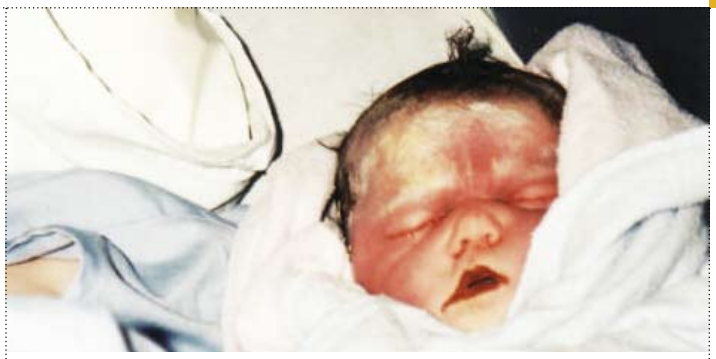
Secondary to polyhydramnios: malpresentation, cord prolapse.
Secondary to macrosomia: obstructed labour, shoulder dystocia.

Post-partum

Adjust insulin to preconception level. Contraception: intrauterine contraceptive device is of choice. Today you went to the antenatal assessment unit in your hospital where you saw this woman.

She is 28 years old. Currently 35 weeks in her first pregnancy. She is complaining of severe itching in her hands and feet for the last 4 days. She can't sleep at night because of the itching and she is really distressed and wants your help.

If the first step you did is to ascertain or refute the following diagnosis, then you are right!



Intrahepatic cholestasis

Increased sensitivity to oestrogen is blamed as the main etiological factor. This causes an increased permeability of hepatocyte and the bile duct with disruption of cholesterol and phospholipids ratio.

Presentation: familial, usually in third trimester. Severe pruritus, typically in soles and palms, and spreads to the trunk and limbs. No associated rash but excoriation may be present. Pale stool, dark urine, anorexia and steatorrhoea, and occasionally, jaundice.

Maternal risks: depletion of vitamin K dependant clotting factors and increase in rate of post-partum haemorrhage.

Foetal risks: intrauterine foetal death (IUFD), perinatal death is twice as common and usually occurs after 36 weeks. Increase intrapartum meconium stained liquor, intrapartum foetal distress. There is also an increased risk of intracranial hemorrhage secondary to vitamin K deficiency.

Diagnosis: there is moderate (two to threefold) increase in liver enzymes and alkaline phosphatase. Bile acid shows between a ten and one hundredfold increase. Prolonged prothrombin time. These test should be repeated twice weekly. Ultrasound for gall stones, hepatitis serology and screen for autoimmune liver disease.

Management: itching is difficult to control but chlorpheniramine 4mg QID PO might help. Vitamin K pre-delivery is advisable (10mg daily). Urodeoxycholic acid (8–12mg/kg daily in two divided doses) has been used with success with no evident foetal affect. Steroids if preterm delivery is anticipated.

Delivery: active management with IOL. Caesarean section is reserved for obstetric indication, foetal compromise.

Post-natal: full recovery is the usual course. If LFT has not returned to normal after delivery, exclude liver cirrhosis. The combine oral contraceptive pill is contraindicated. Recurrence rate between 50–100%.

You are invited to attend a joint antenatal clinic. These are examples of some women you might meet in such specialised clinics.

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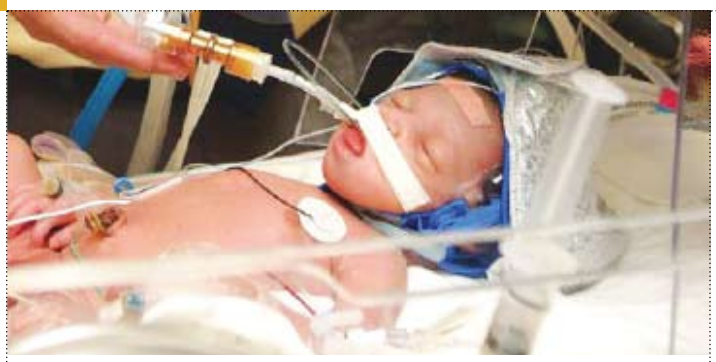

Thyroid disease in pregnancy

Hyperthyroidism affects 1:500 pregnancies. Most cases are due to Graves disease an autoimmune disease. There is an increased incidence of miscarriage. TFT is unreliable in pregnancy. Diagnosis is established by finding a raised T3/T4 and suppressed TSH.

Antithyroid drugs: propylthiouracil and carbimazole have both been used in pregnancy. They can pass via the placenta and can cause foetal goitre and hypothyroidism and so the minimum effective dose should be used. Iodine should only be used pre-operatively or in the advent of a thyroid crisis. Propranolol is best avoided as it is associated with foetal growth retardation. Yet it can be used initially to control tachycardia, sweating and tremors.

Surgery might be used in the second trimester; it is usually reserved for patients with stridor-related to enlarged goitre and those with suspected/ confirmed malignancy. Radioactive iodine is contraindicated in pregnancy and breastfeeding.

Epilepsy

Preconception counselling: all antiepileptic medications are associated with increased congenital abnormalities. Neural tube defects can occur particularly with sodium valporate (1–2%) and carbamazepine (0.5–1%). If fit free for years, consider stopping the medications. This decision should be made after detailed counselling and with the patient fully informed, especially of the risk of losing their driving license in the event of seizures. Folic acid 5mg daily for 12 weeks before conception and all though pregnancy (to decrease the risk of folate deficiency anaemia even after the risk of neural tube defects has past). The child is at an increasing risk of developing epilepsy, which is 4% if either parent is epileptic and 15–20% if both sufferers.

Antenatal: multidisciplinary and should be managed by a clinician with the appropriate experience. Prenatal screening: neural tube defects and cardiac scan at 22 weeks.

Growth serial scan especially if poorly controlled. Give vitamin K 20mg for the last 4 weeks of pregnancy if on an enzyme inducing anticonvulsant. Give advise regarding the avoidance of stress and ensuring adequate sleep. If the patient is fit free, there is no need for measuring drug level and adjusting dose of antiepileptics.

Intrapartum: continue medication. Control fits by rectal diazepam. MgSO4 if suspecting eclampsia.

Post-natal: vitamin K for the neonate. There is no contraindication for breastfeeding. Review anticonvulsant regimens. Contraception should be with high dose oestrogen/higher dose progesterone only pills, due to enzyme inducing activity of phenytoin. Advise about safe handling and bathing of the baby.

Autoimmune (Idiopathic Thrombocytopenia) (ITP)

Autoantibodies against platelet surface antigens cause peripheral platelet destruction in the reticuloendothelial system, particularly the spleen. Platelet count of 100–150x10^9/L may be accepted in pregnancy.

Diagnosis: suspected when platelet count is less than 100. Diagnosis is by exclusion as it is difficult to detect the antibodies.

Effect of pregnancy on ITP: pregnancy does not seem to affect the course of the disease. Effect of ITP on pregnancy: purpura appears if platelet count <50 and spontaneous mucous membrane bleeding if platelet <20. Antiplatelet antibodies are IgG that cross the placenta and cause foetal thrombocytopenia. There is no relationship between the maternal level of antibodies or platelet count and those of the foetus, this is difficult to predict. The risk of the foetus having a platelet count of less than 50, is between 5–10% and the risk of antenatal and neonatal hemorrhage is around 2%.

Antenatal: multidisciplinary – treatment is advisable if the platelet count less than 50x10^9/L or there are bleeding complications.

Treatment: steroids are the first line of treatment. A large dose of prednisolone is given (60–80mg/day) then gradually decreased. A high dose immunoglobulin infusion is used in resistant cases and is thought to cause immune paralysis stopping the progress of the disease.

Delivery: method should be dependant on obstetric consideration. There is no evidence that Caesarean section decreases the risk of foetal intracranial hemorrhage. Epidural should be avoided if the platelet count is below 70_10^9/L. Foetal blood sampling (FBS) and instrumental delivery should be avoided. Platelet transfusion should be commenced if the platelet count is less than 40x10^9/L and a Caesarean section is going to be performed.

Post-natal: cord blood count and neonatal blood count are monitored over the next 3–4 days post delivery. IV immunoglobulin for neonate if bleeding or thrombocytopenia.

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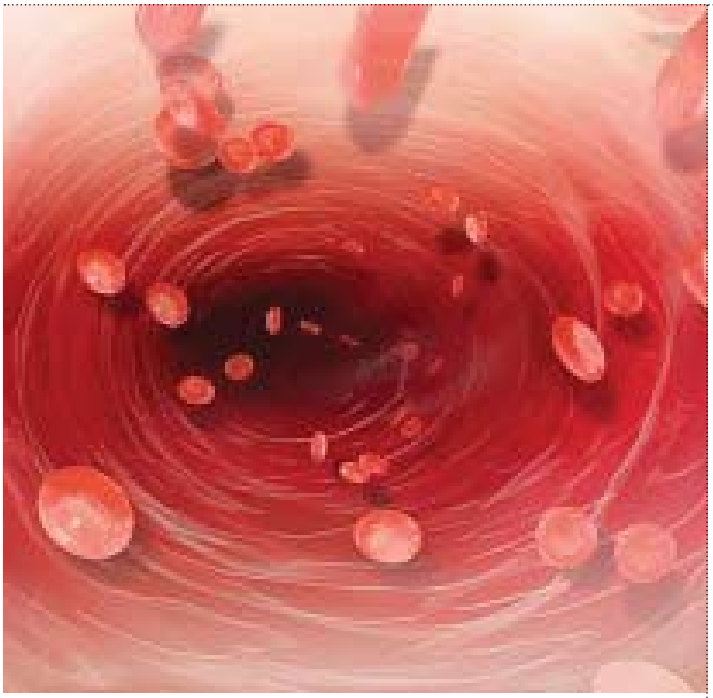

Thrombophilia

A group of familial or acquired disorders of homeostasis with increased tendency for thrombosis.

Classification: Acquired: antiphospholipid antibodies. Lupus anticoagulant.

Inherited: factor V Leiden mutation. Prothrombin gene mutation. Antithrombin deficiency. Protein C/protein S deficiency.

Antiphospholipids (APL) Diagnosis

Antiphospholipid antibodies: dilute Russell viper venom test (dRVVT) for lupus twice 6–8 weeks apart; ELISA for IgG, IgM for anticardiolipin; arterial and venous thrombosis.

Adverse pregnancy outcome: three or more unexplained first trimester miscarriages, One foetal death >10 weeks with normal phenotype, premature delivery <34 weeks due to severe PET or IUGR.

Treatment: gives good response to low dose aspirin (+/- LMWH if there is history of thrombosis), thromboprophylaxis for 6-weeks post-partum.

Factor V Leiden

Autosomal dominant, common (5–7%).
Tends to run true (families with miscarriage or adverse outcome).
Can be tested (PCR or via activated protein C resistance).
Increase thrombosis tendency by making factor V complexes more resistant to break down.

Systemic lupus erythematosus (SLE)

It is more common in women (1:9) especially of childbearing age (1:15).

Diagnosis:
Four of; butterfly rash, photosensitivity, proteinuria >0.5/24hrs, convulsions, psychosis, pleurisy/pericarditis, non-erosive arthritis affecting two or more joints. + One of; haemolytic anaemia, anti DNA-ANCA, leucopoenia/thrombocytopenia.

Risks: (prognosis is good in the absence of lupus nephritis). Flaring: x3 (<20 weeks), x1.5 (>20 weeks), x6 (peurperum). Lupus antibodies: if so, give LDA. Anti-Ro and Anti-LA; there is increased risk of congenital heart block (2%, reversible) and neonatal cutaneous lupus (5%). If lupus nephritis: PET, foetal: miscarriage, IUGR, preterm labour (those reaching term have got the same perinatal mortality as general mortality).

Drugs: steroids/azathioprim. No cyto-toxicity, yet reports of preterm labour and decreased foetal weight. NSAIDs; premature closure of ductus. Cyclophosphamide; teratogenic. Multidisciplinary approach in a combined clinic with a rheumatologist.

Sickle-cell disease / trait

There are three variants: sickle-cell disease (homozygous), sickle-cell trait (40% HbS, 2% Hb A2, rest is Hb A1) and sickle-cell thalassaemia. HbS is a variant of the B chain, sickling of red blood cells (RBCs) occurs in response to infection, cold, dehydration and hypoxia.

Manifestations: anaemia, painful crises, infections, acute chest syndrome, splenic sequestration, aseptic bone necrosis, stroke.

Effect of pregnancy: increase in complications (PET, renal infarction). Thirty-five per cent of pregnancies will be complicated by crises.

Effect of disease on pregnancy: MMR 2.5%, PNM increases four to sixfold. There is an increase risk of miscarriage, IUGR, preterm labour, FD, CS. There is increase risk of TED, PET and bone marrow embolism. Increased risk of UTI, pneumonia, puerperal sepsis.

Pre-pregnancy counselling: determine partner status (if trait, 50% of offspring to be affected). Prenatal diagnosis (CVS, amniocentesis).

Management of pregnancy: combined care with haematologist. Hb, electrophoresis to determine HbF, S levels (better outcome with increase HbF). Foetal growth monitor. Avoid precipitating factors for crises (good hydration, warmth, treatment of infection).

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Crohn's Disease

Pre-conception: pregnancy usually does not affect the course of the disease and fertility is unaffected in well controlled disease. Patients with prior surgery tolerate pregnancy well. Women should try to conceive at times when the disease is in remission. Peri-conception folic acid is recommended (but no more than for any other woman planning pregnancy).

Antenatal: Crohn's disease remains quiescent in 75% of cases with exacerbation occurring mostly in the first trimester. The active disease is associated with prematurity. Some women who become pregnant after ileostomy or massive gut resection may develop problems, such as malabsorption of fat, fat soluble vitamins and vitamin B12, water, electrolyte imbalance and cholelithiasis. The safety of metronidazole and azathioprine in early pregnancy is not proven.

Delivery: most women with a quiescent disease reach full term, and steroids are indicated according to the course of pregnancy. CS is not required unless in those women with perianal Crohn's and abscesses.

Post-natal: Post-partum flare may occur. Sulphasalazine and steroids may be used safely during pregnancy and breastfeeding. The combined oral contraceptive pill should be avoided as it might exacerbate the disease.

Thalassaemias

∂-thalassaemia is more prevalent in the southeast Asia populations,
1 to 4 of ∂-genes are deleted.
ß-thalassaemia is more prevalent in the Cypriot and Asian populations,
1 or 2 of ß-genes are defective.

∂-thalassaemia major (∂-0): no functional ∂-genes.
Incompatible with life, foetus develops hydrops.

∂-thalassaemia trait (2–3 normal genes): usually asymptomatic but should be identified as they may become anaemic.

ß-thalassaemia major: (Cooley's anaemia). Can now live until second and third decade with regular transfusions. There is iron overload with hepatic, endocrine and cardiac dysfunction. There is bone deformity due to expansion of bone marrow (BM). BM transplant is now another treatment option. Patients with this condition rarely fall pregnant.

ß-thalassaemia trait: asymptomatic, more liable to develop anaemia.

Diagnosis: Microcytic hypochromic anaemia with normal MCHC. Confirmed by globulin chain synthesis studies.

Management: trait versions need both iron and folate supplementations all through pregnancy. Parenteral folate may be needed. Never use parenteral iron

Further reading

The Management of Severe Pre-Eclampsia/Eclampsia. RCOG. Green top guideline (10A), March 2006.

Thromboembolic Disease in Pregnancy and the Puerperium: Acute Management. RCOG. Green top guideline (28), February 2007.

Obstetric Cholestasis. RCOG. Green top guideline (43), January 2006.

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PRESCRIBING IN PREGNANCY AND BREASTFEEDING

Mayada TS Younis, Maan TS Younis and MA Khaled

Prescribing in pregnancy and breastfeeding poses many dilemmas for the clinician as there are many factors to consider. This article aims to address these and should equip the reader with the knowledge to council, and prescribe for, such patients confidently. Good Clinical Care.

Clinical case

A 25-year-old epileptic, in her first pregnancy, booked with the community midwife at 8-weeks gestation. She was referred for consultant-led obstetric care in view of her medical history where she was seen 2 weeks later. A dating ultrasound scan confirmed she was 9 weeks + 5-days gestation. The epilepsy had been well controlled on 200mg bd of carbemazepine, but she was very anxious regarding the risks of fetal abnormalities associated with anticonvulsants and was considering stopping the medication. However, having discussed the associated risks and benefits with the obstetrician she decided to continue with the medication. She had been taking 400mcg of over the counter folic acid since 3-months preconception. This was increased to 5mg by the obstetrician. She had an additional growth scan at 16-weeks gestation and was followed-up at the joint neurology and antenatal clinic for epileptic patients. At 32-weeks gestation she developed a DVT and was commenced on treatment dose Clexane, 1mg/kg bd. Post-natally, this was converted to warfarin which she continued for 6 months.

Prescribing in pregnancy and breastfeeding poses many dilemmas for the clinician as there are many factors to consider. This article aims to address these and should equip the reader with the knowledge to council, and prescribe for, such patients confidently. The article should also explain the reasoning behind the management choices in the case described above.

Introduction

Although up to 95% of women take 3 to 4 prescribed or over the counter medication at some stage in their pregnancy, few of these have been tested for safety in pregnancy or breastfeeding[1]. Often, the safety of a drug in foetuses and nursing infants cannot be determined until it has been widely used. Clinicians are all too aware of the tragedy of thalidomide in the 1960s; originally marketed as a safe hypnotic and antiemetic to use in pregnancy, it took over 10 years and several hundreds of malformed infants to establish a link between the drug and phocomelia: a congenital absence of all long bones. To complicate matters further, the foetal risks may not be immediately apparent and may not be limited to the exposed generation. The high incidence of vaginal adenocarcinomas in young women exposed in utero to diethylstilbestrol, widely used to prevent miscarriage in the 1970s, is an important example of the delayed effects of drugs administered during pregnancy. In addition, trans-generational effects of diethylstilbestrol have been suggested by a recent cohort study showing increased prevalence of hypospadias in sons of women exposed in utero[2]. Such examples, exacerbated by the lack of reliable information and advice available, fuel anxieties surrounding prescribing in pregnancy and breastfeeding. Due to a lack of knowledge among some doctors, drugs are prescribed despite evidence of possible teratogenicity. Conversely, many women are denied or experience potentially harmful delays in receiving essential treatment. This review intends to address some of the issues surrounding prescribing in pregnancy and breastfeeding and improve the knowledge-base to aid safer prescribing in this group of patients.

Prescribing in pregnancy

All the literature on prescribing in pregnancy reiterates the importance of evaluating the risk against the benefit ratio of drug administration. This is not easy, as many factors influence the impact of a drug on the foetus (see Figure 1). Each of these factors will be explained further below.

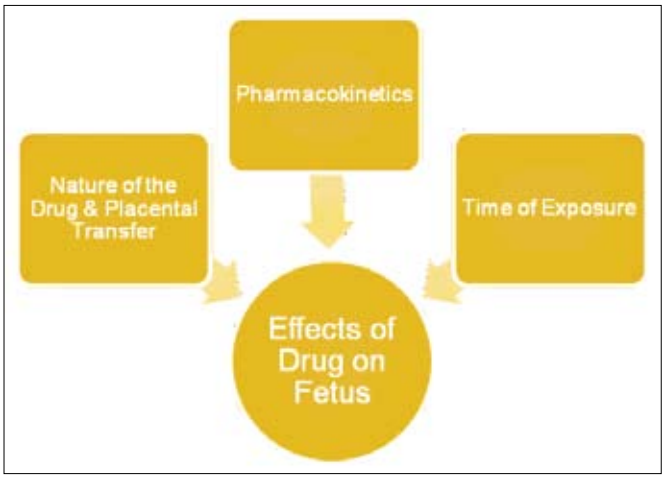

Figure 1: Factors influencing the effect of a drug on the foetus.

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Chemical and physical nature of the drug and placental drug transfer

Placental passage to the embryo or foetus is necessary for a drug to exercise its deleterious effect. Most drugs cross the placenta and enter the foetal circulation to some extent by passive diffusion. As foetal drug metabolism is negligible, drugs that reach foetal circulation may accumulate to toxic levels[3]. Placental transfer depends on the maternal metabolism, as well as protein binding, charge, lipid solubility and molecular size of the substance.

The molecular weight of a drug is an important regulator of its placental passage. Most substances with a mass less than 500daltons diffuse freely across the placental barrier. Substances with higher molecular weights have more difficulty. Unionised lipid soluble drugs can also rapidly enter foetal circulation by simple diffusion. The variations in pH gradient between maternal and conceptual compartments plays an important role too; weak basic drugs, are less likely to be protein bound and can cross the placenta, attracted to the more acidic and hypoxic foetal circulation[4]. The characteristic of drugs with high placental transfer are summarised in Table 1.

Table 1
Small <500daltons
Lipid soluble
Unionised
Weak base

Table 1: Physical and chemical characteristics of drugs with high placental transfer.

Pharmacokinetics

Pregnant women undergo profound physiological and metabolic changes. These adaptations affect virtually all organ systems and metabolic pathways resulting in significant effects on drug absorption, distribution, metabolism and excretion, which in turn will impact on drug prescribing as well as foetal toxicity.

Absorption

Fifty per cent of women suffer with nausea and vomiting in early pregnancy[5]. This will affect ingestion and absorption of drugs, therefore dosing regimens, as well as routes of administration, during this time, may need to be altered. Delayed gastric emptying and reduced gastric acid production, as well as reduced bowel mobility can all alter the absorption of orally administered drugs during pregnancy[6].

Distribution

Total body water increases by an average of 8.5 litres in pregnancy[7]. This impacts on the distribution of water soluble drugs, effectively diluting them throughout the body compartments. There is a relative haemodilution with a 50% rise in plasma volume and 20–30% increase in blood cell mass[7]. Albumin concentration falls as a result of this dilutional effect. As albumin binds many basically charged drugs, maintaining therapeutic levels may be a challenge due to increased clearance of the unbound molecules. In addition, pregnancy causes a partially compensated respiratory alkalosis due to a 40–50% increase in respiratory minute ventilation6, [7]. This may affect the protein binding of drugs, increasing the plasma concentration of unbound drugs further.

Increased levels of oestrogen act on the liver to promote the production of globulins which bind thyroxine, corticosteroids and sex hormones. As thyroid-binding globulin doubles[7] patients on thyroxine replacement therapy require much higher doses to maintain euthyroid status.

Excretion

Cardiac output increases by 50% in pregnancy and so too does renal blood flow6. As a result, glomerular filtration rate increases by 60%[7]. This in turn increases the clearance of renally excreted drugs, such penicillins and cephalosporins. Therefore, higher doses are required in pregnancy.

Metabolism

Increased circulatory oestrogens act on the liver to induce drug metabolising enzymes and the hepatic metabolism of some drugs (such as methadone and anticonvulsants like lamotrigine) is significantly increased, especially in the third trimester[3]. Therefore, higher doses may be required to maintain therapeutic serum concentrations.

Endocrine changes also impact on cellular metabolism. Pregnancy is a state of insulin resistance and glucose intolerance, due to human placental lactogen and increased levels of cortisol, prolactin and other insulin antagonists. Pregnant women double their insulin production. This state of insulin resistance can push vulnerable groups to develop gestational diabetes. Women with pre-existing insulin dependent diabetes mellitus require higher doses of insulin that must be reduced back to pre-pregnancy levels immediately post delivery, as carbohydrate metabolism returns to normal within 24 hours[7].

Timing of drug exposure

In utero development is divided into three time periods; pre-implantation, embryonic and foetal. The conceptus responds differently to drug exposure according to its stage of development at the time.

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Pre-implantation

This is the period from fertilisation of the oocyte to implantation of the blastocyst, up to 2 to 3-weeks post conception and equivalent to 4 to 5-weeks gestation (time since the last menstrual period)[8]. During this time, the blastocyst is undergoing rapid cellular division. Exposure to drugs can result in injury to a large number of cells and spontaneous pregnancy loss or affect a small number of cells, which the totipotent blastocytes can compensate for, facilitating survival without malformations. This is known as the "all or nothing phenomenon"[4].

Embryonic

This includes weeks 3–8 post conception or up to 10-weeks gestation. It is a period of intense cellular differentiation and organogenesis and so is most susceptible to teratogenic agents[8]. Exposure during this stage of development results in major morphological abnormalities.

Foetal

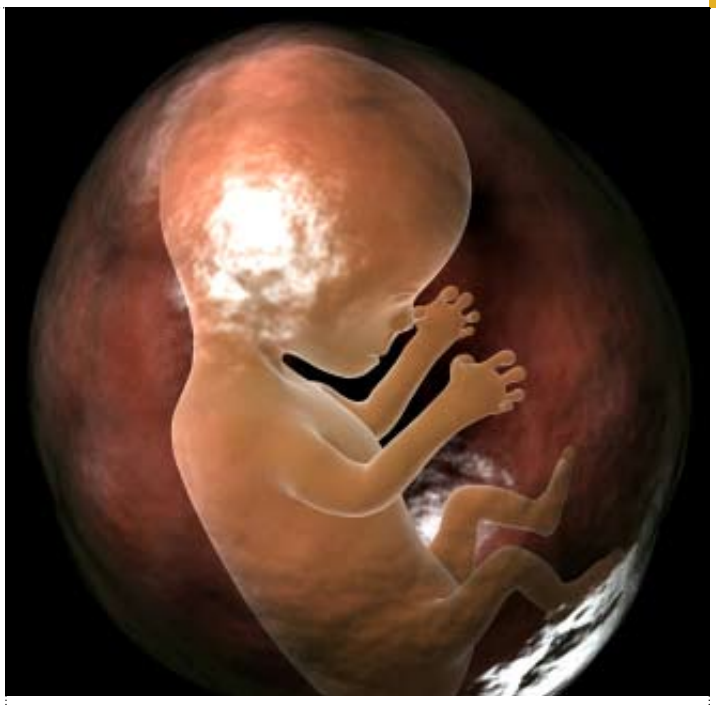
During the foetal stage of development, from 8-weeks post conception, or 10-week gestation to term, tissues mature to a functional state and bone is laid down[9]. Exposure during this time results in functional defects and minor morphological abnormalities. Any effect is most likely to involve growth restriction or an effect on the nervous system and gonadal tissue, as these develop slower than other systems and continue maturing throughout pregnancy[8].

Teratogenicity

Teratogens are agents that act to irreversibly alter growth, structure or function of the developing embryo or foetus[4]. Major congenital abnormalities affect 3% of all births[2]. Although 1% of congenital abnormalities are thought to be caused by exogenous teratogenic agents, including drugs, the magnitude of the problem may be underestimated as 65–70% of birth defects have unknown aetiology[1]. Only 20–30 commonly used drugs are proven teratogens[8] as the conditions necessary to prove teratogenicity of an agent are difficult to meet (see Table 2).

Table 2
Proven exposure at critical times during development
Consistent dysmorphic findings shown in epidemiological studies
Specific defects or syndromes consistently associated with the suspected teratogen
Rare anatomical defects associated with environmental exposures
Proven teratogenicity in experimental animal models

Table 2: Conditions required to prove teratogenicity of an agent[4].



Types of teratogenic effects

The effect of drugs on the conceptus can be divided into pharmacological and idiosyncratic. Pharmacological effects are normally predictable and dose-related. They can be direct (e.g. foetal adrenal suppression secondary to high dose regular steroid administration in the mother) or indirect, through changes in maternal physiology (e.g. reducing maternal blood pressure with antihypertensives can result in foetal hypoxia and intrauterine growth restriction). Idiosyncratic reaction and the dose threshold for their occurrence are unpredictable. The consequences of idiosyncratic reaction are more severe and include major irreversible congenital abnormalities[3].

Use of fetotoxic or teratogenic drugs in pregnancy

An understanding of potential teratogens not only helps guide prescribing during pregnancy but also helps to assess the risk to the foetus when maternal drug exposure has already occurred. Although teratogens should be avoided in pregnant women, as well as non-pregnant women with childbearing potential, this is not always possible. For example, ACE inhibitors may need to be used in rare cases of severe hypertension refractory to other treatment. Anticonvulsants and antidepressants are other potentially teratogenic drugs continued throughout pregnancy as the risk to both the mother and the foetus from failing to treat the mother's illness outweighs the risks to the foetus. In such circumstances the patient must be made fully aware of the potential dangers and involved in the decision-making. Tables 3 and 4 show the drugs associated with fetotoxicity when used in the first, second and third trimesters. In cases where potential teratogens are prescribed or inadvertent exposure has occurred, serial detailed ultrasound scanning from 16-weeks gestation may be useful at identifying malformations and adverse effects early so patients can be counselled appropriately on further management options including specialised imaging (e.g. foetal MRI or echocardiography) and therapeutic abortions in severe cases.

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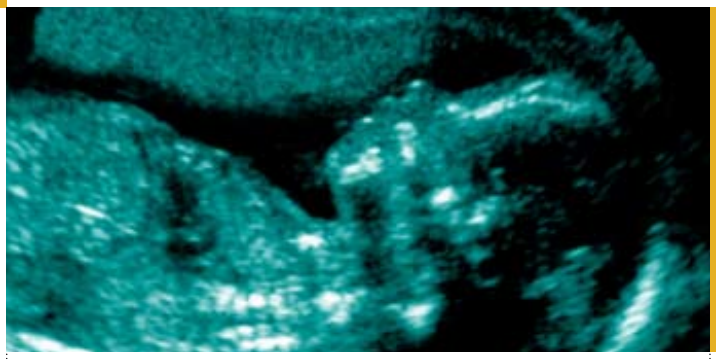

An understanding of potential teratogens not only helps guide prescribing during pregnancy but also helps to assess the risk to the foetus when maternal drug exposure has already occurred. Good Clinical Care.

Drug	Fetotoxic effect
ACE inhibitors and angiotensin II receptor antagonists	Lung and renal hypoplasia, hypocalveria (ossicifation of skull bones), CVD; ASD VSD, pulmonary stenosis, CNS defects; microcephaly, eye anomalies, spina bifida, coloboma
Anticonvulsants	Cardiac, facial and limb defect, NTD, mental retardation
Cytotoxic drugs	Multiple defects, growth retardation, abortion, stillbirth
Androgens	Virilisation of female genital
Diethylstilbestrol	Genital abnormalities in female and male infants, vaginal adenocarcinomas in young women, hypospadias (trans-generational effect)
Other oestrogens	Feminisation of male infants
Lithium	CVD
Misoprostol (after unsuccessful first trimester medical abortion)	Moebus sequence (paparlysis on the 6th and 7th CN), facial, skull and limb malformations
Retinoids	Ear, CVD, skeletal defects, CNS dysfunction
Statins	Spontaneous abortion
Thalidomide	Phocomelia (absence of long bones)
Warfarin	Nasal hypoplasia, dwarfism, abortion (32%)[4]

Table 3: Drugs associated with fetotoxic effects in the first trimester[4, 10].

ASD, Atrial Septal Defect; CN, Cranial Nerves; CNS, Central Nervous System; CVD, Cardiovascular Defects; VSD, Ventricular Septal Defect.

Drug	Fetotoxic effect
ACE inhibitors and angiotensin II receptor antagonists	Oligohydramnios, IUGR, lung and renal hypoplasia, hypocalveria, neonatal convulsions, hypotension, anuria, PDA, aortic arch obstructive malformation, death
Aminoglycosides	Deafness, vestibular damage
Antidepressants	Neonatal withdrawal symptoms
Anticonvulsants	Mental retardation, possible autism/Asperger's syndrome
Beta blockers	Possible IUGR, hypotension, hypoglycaemia
Bezodiazepines	Floppy infant syndrome, neonatal respiratory depression
Cytotoxic drugs	IUGR, stillbirth
NSAIDs	Premature closure of ductus arteriosis, neonatal pulmonary hypertension
Phenothiazines	Neonatal withdrawal, impaired thermoregulation, extrapyramidal effects
Retinoids	CNS dysfunction
Salicylates	Foetal/neonatal haemorrhage
Sex hormones	Virilisation of female foetus, feminisation of male foetus
Sulphonamide	Hyperbilirubinaemia, kernicterus
Tertracyclines	Staining of deciduous teeth, impaired bone growth
Warfarin/coumarins	Foetal haemorrhage, CNS abnormalities, stillbirth (90%)[4]

Table 4: Drugs associated with fetotoxic effects when taken in the second and third trimesters[4, 10].

IUGR, Intra-uterine Growth Restriction; PDA, Patent Ductus Arteriosus.

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Drug commonly prescribed in pregnancy

Many of the commonly prescribed drugs in pregnancy have adverse side effects in the foetus and neonate. This by no means implies that they should not be used. The risk to benefit ratio must always be considered and extra precautions are required in certain circumstances (see Table 5).

Drug group	Recommended agents	Precautions/comments
Analgesics	Paracetamol, codeine, dihydrocodeine, pethidine	Withdrawal symptoms in the neonate with prolonged, high dose opiate use. Opiates just before delivery will cause respiratory depression
Antibiotics	Penicillins, cephalosporins, erythromycin	
Anticoagulants	Heparin a large molecule, does not cross the placenta	Monitor platelet count as can exacerbate pregnancy induced thrombocytopenia
Anticonvulsants	Lamotrigine; foetal exposure has not been shown to increase risk of major anomalies[4] If good control is achieved on teratogenic agents, pregnancy is not the appropriate time to change treatment	Pregnancy is associated with increased seizure frequency, secondary to sleep deprivation, hormonal and pharmacokinetic changes. As uncontrolled epilepsy is hazardous to mother and foetus, it is important that medication is continued throughout pregnancy to maintain control Infants of epileptic mothers have a 10% risk of congenital malformations (3% in general population)[11] Folic acid, 5mg from preconception to 12-weeks gestation prescribed to prevent NTD, as most anticonvulsants can cause folate deficiency Enzyme inducing drugs (e.g. carbamazepine) can reduce levels of vitamin K. Vitamin K 20mg from 36-weeks gestation is recommended to prevent neonatal intracranial haemorrhage[11]
Antidepressants	Fluoxetine; crosses the placenta but considered a teratogen[4]	Amitriptyline and imipramine appropriate in pregnancy (based on length of time they have been used and cumulative data on lack of fetotoxicity), but SSRIs are safer in overdose[12]
Antiemetics	first line promethazine, second line prochlorpera-zine, metop-locramide, cyclizine, third line ondansetron	Avoid poly-pharmacy if possible. Try rectal or buccal administration
Antihyperten-sives	Methyldopa, labetalol, nifedipine	ACE inhibitors and angiotensin II receptor antagonists are strongly contraindicated
Antithyroids	Propylthiouracil preferred to carbimzole as associated with fewer malformations	Both cross the placenta and are known teratogens (foetal hypothyroidism , goitre, cretinism, aplasia cutis, choanal and oesophageal atresia) but the risk of malformations less than in that of untreated hyperthyroidism[11]
Hypoglycae-mics	Insulin	Oral hypoglycaemics are not used, as they do not control glucose levels as well as insulin, in pregnancy Sulphonylureas have been associated with increased risk of foetal malformations and neonatal hypoglycaemia. It is not clear whether this is a direct effect of the drug or secondary to poor glucose control[12]
Laxatives	Fybogel, lactulose, docusate	Avoid senna; may induce uterine contraction close to term[5]

Table 5: Medications appropriate for use in pregnancy.

NTD, Neural Tube Defects; SSRIs, Selective Serotonin Re-uptake Inhibitors.

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Prescribing in breastfeeding

Breastfeeding is the best method of feeding infants and is regarded as one of the most important measures to improve child health. Not only is breast milk nutritionally optimal in terms of content and quantity, breastfeeding also provides other physical, immunological and psychological benefits to both infant and mother. Exclusive breastfeeding for the first 6 months of life is recommended by the World Health Organisation. The infant feeding survey in 2005 revealed that breastfeeding rates were on the rise throughout UK. In England alone, they have increased from 71% in 1990 to 78% in 200513. Unfortunately many women stop breastfeeding due to anxieties surrounding its safety while on prescription medications and inappropriate advice to cease breastfeeding by clinicians with limited knowledge in the area. Although almost all drugs taken by a nursing mother will be excreted into breast milk, most only appear in very small amounts, and few are contraindicated in breastfeeding (see Table 6)[14]. Very occasionally, the mother has a condition, such as HIV, or requires medications not compatible with safe breastfeeding. In such circumstances it is in the best interests of the mother and infant for breastfeeding to be discontinued.

Drug	Adverse effects and special considerations	Alternatives/ suggestions
Amiodarone	High concentration in breast milk. Thyroid dysfunction	Verapamil, digoxin
Anti-neoplastic agents	Present in breast milk for up to a year post treatment, potential cytotoxic effects in the infant	Stop breastfeeding
Carbimazole	Excreted in breast milk and can cause neonatal hypothyroidism	Propylthiouracil
Chloramphenicol (iv/oral)	Bone marrow toxicity	Administer topically (e.g. eye drops)
Ciprofloxacin	Arthropathy (animal studies), other serious toxicities[14]	Suspend breastfeeding for 48 hours after last dose[14]
Doxepin (TCA)	Accumulation of metabolites may cause sedation and respiratory depression	Paroxetine - data suggests it is not detected in neonates exclusively breastfed[4]. Other TCA/SSRIs are compatible with breast-feeding but infant must be monitored with all
Ergotamine	Inhibits lactation, ergotism in infants	Metoprolol (to treat migraines)
Gold Salts	Theoretical possibility of rashes and idiosyncratic reactions	Possibly penicillamine; but manufacturers advise to avoid unless benefits>risks
Iodides	Neonatal hypothyroidism and goitre	Stop breastfeeding
Isoniazid	Toxicity, theoretical risk of convulsions and neuropathy	Prophylactic pyridoxine advisable in mother and infant
Indomethacin	Convulsions in infant	Ibuprofen
Lithium	High concentration in breast milk; may cause lithium toxicity	Stop breastfeeding or measure levels in breastfed infants
Metronidazole	Significant amounts in milk, unpalatable metallic tasting milk may disrupt feeding habits	Avoid single large doses, withhold breastfeeding for 12–24 hours after 2g dose[14] penicillins / cephalosporins / erythromycin
Methotrexate	Potential cytotoxic effects and folate deficiency	Stop breastfeeding
Oestrogens (high dose)	Not harmful to infants but diminishes maternal milk supply	POP, implanon, Depo-Provera, mirena, IUCD, barrier methods
Pethidine (multiple doses)	Present in breast milk, can accumulate with multiple doses and cause dependence in infants	Morphine/codeine
Phenobarbital	Drowsiness. One report of methaemoglobinaemia[15]	Lamotrigine
Radioactive isotopes	Radiotoxicity. Iodine concentrates in breast milk	Avoid breastfeeding for at least 24-hours post diagnostic doses. Stop breastfeeding post treatment dose[15]
Theophylline	Irritability in infants	Use modified release preparations
Vitamin D (high doses)	Hypercalcaemia in infants	Use lower doses/delay treatment till weaning if possible or stop breastfeeding

Table 6: Drugs contraindicated in breastfeeding and safer alternatives.

H, hour; POP, Progesterone Only Pill; SSRIs, Serotonin re-uptake Inhibitors; TCA, Tricyclic Antidepressant.

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Factors influencing drug safety in breastfeeding

The amount of a drug excreted into breast milk, and the potential to cause adverse effects vary considerably, and are dependent upon drug, infant and maternal factors (see Figure 2). It is possible to minimise risks by the careful selection of drug, dose, route and timing of administration relative to feeding.

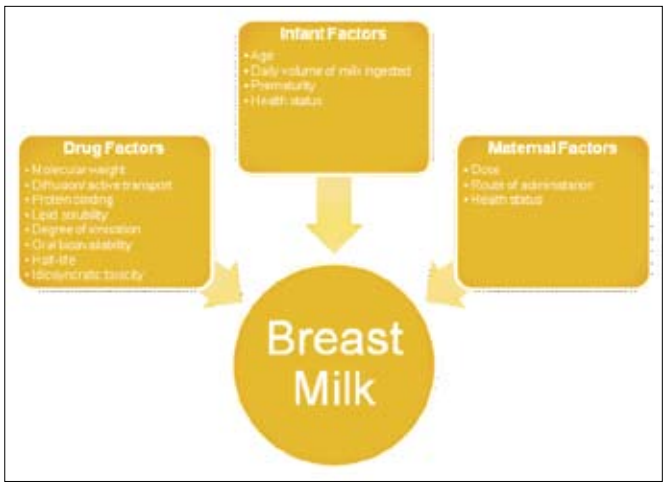

Figure 2: Factors influencing the amount of drug excreted into breast milk, and the potential to cause adverse effects.

Drug factors

Molecular weight

Drugs with a low molecular weight, such as lithium, appear in breast milk very rapidly after maternal ingestion and at very high concentrations. Drugs with a molecular weight greater than 1000daltons, such as heparin and insulin, do not enter milk[16].

Diffusion or active transport

The transfer of drugs into breast milk is driven primarily by passive diffusion down a concentration gradient. Retrograde diffusion of the drug from breast milk to plasma may remove drugs from the milk even if the mother has not emptied her breast, as the maternal plasma concentration falls[17]. In a few instances drugs are transferred into milk by active transport mechanisms, resulting in greater concentrations of the drug in milk than in maternal plasma[14].

Protein binding

Drugs which are highly protein bound in the maternal plasma (e.g. warfarin) have the lowest breast milk levels.

Lipid solubility

Highly lipid soluble drugs penetrate milk in higher concentrations.

Degree of ionisation

Drugs which are unionised in plasma are excreted into milk in greater amounts than ionised compounds[14]. In addition, as breast milk is slightly more acidic than maternal plasma, with pHs of 7.2 and 7.4 respectively, certain weak bases may enter the milk, become ionised there, and then fail to diffuse back into plasma. This phenomenon is known as ion trapping. Drugs such as ranitidine and barbiturates show this trend and consequently have relatively high milk: plasma ratios. On the other hand, weakly acidic drugs will be readily ionised in plasma and not enter breast milk as their ability to cross the lipid membrane is inhibited by their polarity[16].

Oral bioavailability

Some drugs are destroyed in the infant's gut, and never enter the systemic circulation to pose a risk. Others are so poorly absorbed from the gastrointestinal tract, it is unlikely that the infant will absorb significant quantities to cause adverse effects[14]. In addition, the immaturity of a young bowel means that many drugs, which usually have good bioavailability, are not absorbed and so unlikely to cause harm either. However, drug such as antibiotics, which may concentrate in the gastrointestinal tract may pose other problems, such as diarrhoea and thrush, due to their local effects[16].

Half-life

Exposure to drugs with long half-lives or active metabolites may be prolonged, and risks of adverse effects are increased. In general, such drugs should be avoided especially in premature or newborn infants[14].

Idiosyncratic toxicity

A few drugs may cause idiosyncratic or allergic reactions unrelated to the amount ingested.

Infant Factors

Age

In the early post-partum period large gaps between mammary alveolar cells allow many drugs to pass into this milk that may not be able to enter mature milk. These gaps close by the second week of lactation[17]. Neonates are therefore at greatest risk in the first week of life.

Volume of milk ingested

Young infants that are solely breastfed will have the highest exposure to drugs in breast milk. Older infants will ingest decreasing amounts of drugs as they are weaned off breast milk onto solid foods

Prematurity

Premature infants are at greater risk from exposure to drugs, via breast milk, because of immature excretory functions and the consequent risk of drug accumulation.

Health status

Low birthweight or otherwise compromised infants are at higher risk of adverse drug reactions, due to suboptimal metabolism and excretion potential.

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Maternal Factors

Dose

In general there is a direct relationship between maternal dose and milk levels. Dose frequency will affect the ability to time breastfeeding to avoid maximum concentrations in milk.

Route of administration

Parenteral administration produces higher maternal plasma levels than oral administration, while drugs administered topically or by inhalation normally produce very low systemic levels.

Health status

Maternal drug accumulation due to renal or hepatic impairment may increase the risk of toxicity in the infant.

Conclusion

Due to the lack of a reliable evidence base, prescribing in pregnancy and breastfeeding is not an exact science but a multifaceted art. Clinicians must be able to tailor prescribing to the individual and their particular circumstances, while taking into account recommendations made for the general population. Patients must be educated of potential risks to aid informed decision-making, especially when contraindicated or new drug therapies are prescribed. Clinicians must also use appropriate reference sources. Finally, a good doctor must be able to identified their limitations and know when to seek advice or refer patients to specialists. Tables 7 and 8 summaries the principles of safe prescribing in pregnancy and breastfeeding.

Table 7
Always weigh up the benefits versus the risks to the mother and foetus
Try to avoid all drugs if possible in the first trimester
Use drugs with established safety, that have been extensively used in pregnancy
Avoid using new or untried drugs
Use the lowest effective dose for the shortest possible duration
Avoid poly-pharamacy if at all possible; if one antiemetic is not effective stop it and try another one
Optomise drug therapy pre-conception if possible; switch to safer drugs or taper medications to the lowest effective dose
Use appropriate reference sources (e.g. the BNF, national teratology information www.nyrdtc.nhs.uk/Services/teratology/teratology.html 0191 2321525)

Table 7: Principles of safe prescribing in pregnancy.

General considerations
Consider whether drug therapy is necessary or if it can be delayed until weaning
Always assess the benefit/risk ratio for mother and infant
Greater precaution is necessary in premature or compromised infants and neonates in the first week of life
Use topical therapy where possible
Medication that are licensed for use in infants are generally safe for use in the beastfeeding mother
Medications that are safe in pregnancy are not always safe in breastfeeding and vice versa
Monotherapy is preferable to multiple drug regimens, which may have additive adverse effects
Use reliable reference sources for obtaining information on medication in breast milk. Seek advice on suitability if not sure
Medication selection
Choose medications with the shortest half-life and highest protein binding ability
Avoid new drugs due to the lack of data and choose drugs that are well studied in infants
Avoid drugs with active metabolites
Choose drugs with the poorest oral absorption
Choose medications with the lowest lipid solubility
Medications that are safe in pregnancy are not always safe in breastfeeding and vice versa
Monotherapy is preferable to multiple drug regimens, which may have additive adverse effects
Use reliable reference sources for obtaining information on medication in breast milk. Seek advice on suitability if not sure
Medication dosing
Administer once daily medication just before the longest sleep interval for the infant, usually after the bedtime feeding
Breastfeed infants immediately before medication dose when multiple daily doses are needed
Use the lowest effective dose and for the shortest time
Choose drugs with the poorest oral absorption
Choose medications with the lowest lipid solubility
Medications that are safe in pregnancy are not always safe in breastfeeding and vice versa
Monotherapy is preferable to multiple drug regimens, which may have additive adverse effects
Use reliable reference sources for obtaining information on medication in breast milk. Seek advice on suitability if not sure

Table 8: Principles of safe prescribing in breastfeeding[17].

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AN INTRODUCTION TO UROGYNAECOLOGY

Suvarna H Mahavarkar, Chendrimada K Madhu and Khaled Khaled

A 52-year-old obese lady (BMI-40), who is menopausal for the past 2 years, presents with a history of leakage of urine on coughing and sneezing. Good Clinical Care.

Urogynaecology

The field of urogynaecology is a subspecialty within obstetrics and gynaecology and is dedicated to the study and treatment of pelvic floor disorders in women, such as urinary incontinence and pelvic organ prolapse.

Urinary incontinence (UI)

Case history

A 52-year-old obese lady (BMI-40), who is menopausal for the past 2 years, presents with a history of leakage of urine on coughing and sneezing. She empties her bladder every 1–2 hours and has to get up 2–3 times every night. She sometimes gets an intense desire to pass urine and leaks before she reaches the toilet. She does not have any pain with urination. These symptoms have gradually worsened over the past year and have been affecting her social and personal life. She now has to wear a pad all the time. She has had 2 normal deliveries and a Caesarean section for the delivery of her 3 children. She smokes about 15 cigarettes and drinks about 8 cups of coffee a day.

What is the most likely diagnosis?

The most likely diagnosis is of urinary incontinence, likely to be of mixed type (both stress and urge urinary incontinence).

How will you treat her?

Treatment will depend on the type of incontinence, which is diagnosed by further urodynamic assessment. Stress incontinence is managed by pelvic floor exercises and surgery. Urge incontinence is managed by lifestyle changes, bladder retraining and medications (anti-cholinergics).

Urinary incontinence is defined as a condition of involuntary urine loss that is objectively demonstrable and is a social or hygienic problem (International Continence Society). Urinary incontinence is common, especially in women. It can occur at any age, with increasing incidences in older women. About 3 million people in the UK are estimated to be regularly incontinent and 1 in 5 women over the age of 40 have some degree of urinary incontinence.

The urinary bladder has been famously called an unreliable witness, because lower urinary symptoms are often misleading. There are different types of urinary incontinence and symptoms, examination and urodynamic assessments help in differentiating them:

- Stress incontinence is the most common type. Stress UI is involuntary urine leakage on coughing, effort, exertion or sneezing. It occurs when the pressure in the bladder becomes too great for the bladder outlet to withstand. It usually occurs when the supports to the bladder outlet are weakened. The common reason for this is childbirth. It is also more common with increasing age and obesity.
- Urge incontinence (unstable or overactive bladder) is the second most common cause. Urge UI is involuntary urine leakage accompanied or immediately preceded by urgency (a sudden compelling desire to urinate that is difficult to defer). The bladder muscle contracts too early and normal control is reduced. In most cases, the cause of urge incontinence is not known. This is called idiopathic urge incontinence.
- Mixed incontinence is involuntary urine leakage associated with urgency and coughing, effort, exertion or sneezing.

Most cases of urinary incontinence are due to the above causes. Other causes are less common. They include:

- Overflow incontinence is when there is an obstruction to the outflow of urine, which prevents the normal emptying of the bladder. However, pressure builds up behind the obstruction and urine may leak past the blockage from time to time.
- Bed-wetting (enuresis) occurs in many children, but some adults are affected.
- Overactive bladder syndrome (OAB) is defined as urgency that occurs with or without urge UI and usually with frequency and nocturia. OAB that occurs with urge UI is known as "OAB wet". OAB that occurs without urge UI is known as "OAB dry".

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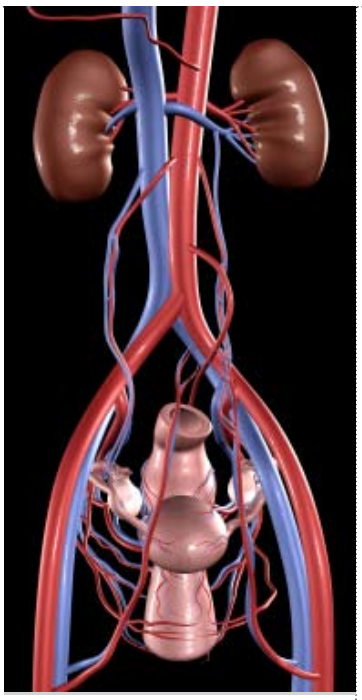
Assessment and investigation

At the initial clinical assessment, the woman's urinary incontinence (UI) should be categorised as stress UI, mixed UI or urge UI/overactive bladder syndrome (OAB). Initial treatment should be started on this basis. In mixed UI, treatment should be directed towards the predominant symptom. A symptomatic categorisation of UI based on reports from the woman and history taking is sufficiently reliable to inform initial, non-invasive treatment decisions.



Bladder diaries should be used in the initial assessment of women with UI or OAB. Women should be encouraged to complete a minimum of 3 days of the diary covering variations in their usual activities, such as both working and leisure days. Bladder diaries are a reliable method of quantifying urinary frequency and incontinence episodes. A 3-day period allows variation in day to day activities to be captured while securing reasonable compliance.

Multichannel filling and voiding cystometry is recommended in women before surgery for UI if:

- there is clinical suspicion of detrusor overactivity
- there has been previous surgery for stress incontinence or anterior compartment prolapse
- there are symptoms suggestive of voiding dysfunction.

It is not recommended before starting conservative management or for a very small group of women with a clearly defined clinical diagnosis of pure SUI.

It has not been shown that carrying out urodynamic investigations before initial treatment improves outcome. Complex reconstructive urological procedures were developed for use in specific urodynamic abnormalities. Hence, urodynamic investigations should be used to demonstrate the presence of specific abnormalities before undertaking these procedures. Urodynamic investigations are also of value if the clinical diagnosis is unclear prior to surgery or if initial surgical treatment has failed, and to identify those at increased risk of avoiding problems after surgery.

Conservative management

A trial of supervised pelvic floor muscle training of at least 3-months duration should be offered as first line treatment to women with stress or mixed UI. There is good evidence that daily pelvic floor muscle training continued for 3 months is a safe and effective treatment for stress and mixed UI.

Bladder training lasting for a minimum of 6 weeks should be offered as first line treatment to women with urge or mixed UI. There is good evidence that bladder training is an effective treatment for urge or mixed UI, with fewer adverse effects and lower relapse rates than treatment with antimuscarinic drugs.

Immediate release non-proprietary oxybutynin should be offered to women with OAB or mixed UI as first line drug treatment if bladder training has been ineffective. If immediate release oxybutynin is not well tolerated, darifenacin, solifenacin, tolterodine, trospium, or an extended release or transdermal formulation of oxybutynin should be considered as alternatives. Women should be counselled about the adverse effects of antimuscarinic drugs. There is no evidence of a clinically important difference in efficacy between antimuscarinic drugs. However, immediate release non-proprietary oxybutynin is the most cost-effective of the available options.

Pelvic floor muscle training should be offered to women in their first pregnancy as a preventive strategy for UI. There is evidence that pelvic floor muscle training used during a first pregnancy reduces the likelihood of post-natal UI.

Surgical management

Sacral nerve stimulation is recommended for the treatment of UI due to detrusor overactivity in women who have not responded to conservative treatments. Women should be offered sacral nerve stimulation on the basis of their response to preliminary percutaneous nerve evaluation. Lifelong follow-up is recommended. The treatment options for women who have detrusor overactivity and have not responded to conservative therapy are all costly and associated with significant morbidity. There is a stronger body of evidence for the effectiveness of sacral nerve stimulation than for other procedures. Up to two-thirds of patients achieve continence or a substantial improvement in symptoms after this treatment.

- Retropubic mid-urethral tape procedures using a "bottom-up" approach with macroporous (type 1) polypropylene mesh are recommended as treatment options for stress UI where conservative management has failed. Open colposuspension and autologous rectus fascial sling are the recommended alternatives when clinically appropriate.

Many procedures have been described for the treatment of stress UI; although there is no strong evidence of superior effectiveness of any one, the best available data support the use of retropubic mid-urethral tape procedures, colposuspension and autologous rectus fascial sling. Retropubic mid-urethral tape procedures consume fewer hospital resources and are associated with faster recovery than the other two procedures.

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Pelvic Organ Prolapse

Case history

A 56-year-old lady presents in the clinic with a history of a lump coming out of the vagina, which is gradually getting worse over the last 6 months. She describes an uncomfortable sensation and a low backache. She does not have any bleeding or discharge per vaginum and does not have any bladder or bowel symptoms. She is menopausal and has not had any periods for the last 2 years. She has not taken any hormone replacement therapy. She has 3 children and has had vaginal deliveries with all of them. Delivery of her first child required an episiotomy. She suffers from asthma, which has been worse in the last 3 months.

What is the most likely diagnosis?

The most likely diagnosis is uterovaginal prolapse.

How will you treat her?

Treatment depends on the severity and type of prolapse; and includes physiotherapy, pessaries and a range of surgical procedures.

Anatomical consideration

Delancey's three levels of support explains uterovaginal prolapse appropriately and is accepted universally.

Level 1: Cardinal–uterosacral ligament complex provides apical attachment of the uterus and vaginal vault to the bony pelvis. Breakdown of this complex occurs in uterine prolapse.

Level 2: the arcus tendineus pelvic fascia, levator ani and the fascia over the levator ani support the middle portion of the vagina.

Level 3: the urogenital diaphragm and the perineal body support the lower vagina.

Risk factors

The aetiology of pelvic organ prolapse is multifactorial. Age is a significant risk factor and the risk doubles with each decade of life. Increasing parity is also associated with increasing severity of prolapse. Older age, race, family history, increased body mass index, higher parity, vaginal delivery and constipation are confirmed risk factors.

Possible risk factors also include intrapartum variables (macrosomia, long second stage of labour, episiotomy, epidural analgesia), increased abdominal pressure and menopause.

History

Many symptoms have been attributed to prolapse, but none of them are specific, except for seeing or feeling a vaginal bulge.

The sensation of a bulge or protrusion, seeing or feeling a bulge, pressure and heaviness are some of the vaginal symptoms.

Incontinence, frequency or urgency, weak or prolonged urinary stream, feeling of incomplete emptying, manual reduction of prolapse needed to start or complete voiding ("digitation") and change of position needed to start or complete voiding are some of the urinary symptoms.

Bowel symptoms include incontinence of flatus, liquid or solid stool, feeling of incomplete emptying, straining during defecation, digital evacuation needed to complete defecation, splinting (pushing on or around the vagina or perineum) needed to start or complete defecation ("digitation").

Sexual symptoms include dyspareunia (painful or difficult intercourse) and lack of sensation.

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Examination

Speculum examination should be done using a Sims speculum. Oestrogen status (vaginal atrophy), extent of the prolapse (grade) and the compartment affected (anterior, apical or posterior) should be noted. The size and mobility of the uterus and the adnexa should also be noted.

Several prolapse grading systems exist, but two are currently accepted, the Baden-Walker Halfway system and the Pelvic Organ Prolapse Quantification (POP-Q) system. The former is simpler and more commonly understood. In this system, the relationship of the most dependant portion of each vaginal compartment, with the hymen and the mid-vaginal plane, on straining, is recorded. The POP-Q system (International Continence Society) records the location of six specific points on each vaginal compartment in centimeters above (negative) or below (positive) the hymen.

Management

Observation

Symptoms do not correlate with the extent of prolapse and watchful expectancy is most appropriate in minimal prolapse. Women opting for no treatment in advanced prolapse should be regularly evaluated for development of new symptoms or complications (obstructed urination or defecation, vaginal erosion).

Conservative treatment

Pelvic floor muscle training

Pelvic floor muscle training is an effective treatment for urinary incontinence, but its role in managing prolapse is unclear. A Cochrane review (2006) concluded that there was no evidence from randomised trials and that further trials were needed in conservative management of uterine prolapse.

Pessaries

Vaginal pessaries are the only currently available non-surgical intervention for managing women with prolapse. Even though there is no robust evidence to support the use of pessaries, 86% of gynaecologists and 98% of urogynaecologists use them. In 2004, a Cochrane review found no randomised trials of pessary use in women with prolapse.

Surgical treatment

Operations, numbering 22,274, were performed for "vaginal prolapse" in England and Wales (2005–2006).

Anterior vaginal wall prolapse is managed by standard anterior repair by vaginal approach. This can be supplemented by polyglactin or porcine dermis mesh inlay which is associated with fewer recurrences than a standard repair *(Cochrane review, 2009).*

Standard posterior repair for posterior vaginal wall prolapse is done by vaginal approach and is associated with a lower rate of recurrence. It is associated with higher blood loss and post-operative narcotic use. Data on the effect on bowel symptoms and use of mesh on risk of recurrence is limited *(Cochrane review, 2009).*

National institute for health and clinical excellence (NICE), in a systematic review of the efficacy and safety of using mesh or grafts in surgery for anterior or posterior vaginal wall prolapse, suggested that the evidence was too sparse to provide meaningful conclusions about their use.

Vaginal hysterectomy is preferred in the UK in managing uterine prolapse. One-third of all hysterectomies in the UK are done vaginally and 95% of these are done for prolapse. A variety of procedures are available to support the vaginal vault at the time of hysterectomy. These include the vaginal procedures McCall culdoplasty; plication of the uterosacral ligament; sacrospinous or prespinous fixation for vaginal vault prolapse; and sacrocolpopexy (performed via an open procedure or laparoscopically).

The meta-analysis of trials of vault suspension procedures showed that abdominal sacrocolpopexy was associated with a lower recurrence of vault prolapse and less dyspareunia than vaginal sacrospinous colpopexy *(Cochrane review, 2009).*

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Pelvic Organ Prolapse: Baden-Walker Halfway systemCystocele	
First degree	The anterior vaginal wall, from the urethral meatus to the anterior fornix, descends halfway to the hymen.
Second degree	The anterior vaginal wall and underlying bladder extend to the hymen.
Third degree	The anterior vaginal wall and underlying urethra and bladder are outside the hymen. This cystocele is often part of the third degree uterine or post-hysterectomy vaginal vault prolapse.
Uterine or vaginal vault prolapse	
First degree	The cervix or vaginal apex descends halfway to the hymen.
Second degree	he cervix or vaginal apex extends to the hymen or over the perineal body.
Third degree	The cervix and corpus uteri extend beyond the hymen or the vaginal vault is everted and protrudes beyond the hymen.
Rectocele	
First degree	The saccular protrusion of the rectovaginal wall descends halfway to the hymen.
Second degree	The sacculation descends to the hymen.
Third degree	The sacculation protrudes or extends beyond the hymen.
Enterocele	
The presence and depth of the enterocele sac, relative to the hymen, should be described anatomically, with the patient in the supine and standing positions during Valsava manoeuvre.	
Staging of pelvic organ prolapse by POP-Q measurements	
Stage 0	No descent of pelvic structures during straining.
Stage 1	The leading surface of the prolapse does not descend bellow 1cm above the hymenal ring.
Stage 2	The leading edge of the prolapse extends from 1cm above the hymen to 1cm through the hymenal ring.
Stage 3	The prolapse extends more than 1cm beyond the hymenal ring, but there is not complete vaginal eversion.
Stage 4	The vagina is completely everted.

Table 1: Showing the pelvic organ prolapse classification.

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INVESTIGATING WOMEN WITH POSTMENOPAUSAL BLEEDING

Fadi Alfhaily, J Evans Jones and MA Khaled

A 59-year-old lady attended rapid access clinic complaining of a bloodstained discharge in the last 2 weeks for the first time since her menopause at age 53. She has no significant gynaecological history. Good Clinical Care.

Objectives

- Recognition of the prevalence and causes of postmenopausal bleeding (PMB).
- Learn to carry out appropriate assessment and investigations of women with PMB.

A problem-based clinical scenario

A 59-year-old lady attended rapid access clinic complaining of a bloodstained discharge in the last 2 weeks for the first time since her menopause at age 53. She has no significant gynaecological history.

1. List 5 more questions you would like to ask her.
2. List your differential diagnosis.
3. List the investigation you might request.

Introduction

Postmenopausal bleeding (PMB) is defined as any vaginal bleeding that occurs after 12 months of cessation of normal menstrual periods due to menopause. It is a common problem in clinical practice with significant implications. PMB is a worrying sign that accounts for about 5% of all outpatient gynecological visits, and is a common indication for referral to rapid access clinics from general practice because of the fear of underlying malignancy. The prevalence of endometrial cancer in women with PMB ranged in various studies from 3% to 10%, and 95% of women with endometrial cancer present with PMB as the only complaint. Therefore, the crucial purpose of the investigation is to rule out malignancy.

Causes of PMB

The potential causes of PMB include:

1.	Atrophic changes:	60–80%
2.	Exogenous hormones:	15–25%
3.	Endometrial or cervical polyps:	2–12%
4.	Endometrial hyperplasia:	5–10%
5.	Endometrial cancer:	3–10%

However, no clear cause of PMB is found in 10–15% of women, therefore, it is important to look for other sources of bleeding, especially stool and urine as occasionally haematuria or rectal bleeding may present as suspected PMB.

Clinical approach to the management of women with PMB

Any episode of PMB should be taken seriously regardless of the severity and duration, therefore, spotting or any episode of pink or brown discharge should be viewed as significant bleeding. The clinical approach for managing women with PMB should include:

1. A thorough history and comprehensive physical examination
2. Office endometrial biopsy
3. Transvaginal ultrasound
4. Saline infusion sonography
5. Outpatient or inpatient hysteroscopy
6. Cervical smear when indicated

The National Institute for Health and Clinical Excellence (NICE) stated in its referral guidelines for suspected cancer that women with PMB and not on hormone replacement therapy should be referred urgently. Most often this referral will be directed to a dedicated rapid access clinic.

It is important when taking a through history to include details of duration, severity of PMB, whether it is related to coitus, other associated symptoms, history of exogenous hormones including tamoxifen and risk factors of genital tract malignancy, such as obesity, hypertension, diabetes, polycystic ovary disease and family history of endometrial, breast, colorectal or hereditary cancers.

A full abdominal and pelvic examination should be performed, including speculum examination of the cervix. A bimanual examination is helpful in assessment of uterine size, mobility and any palpable masses.

Endometrial biopsy (EB)

EB is an easy and widely used procedure in the investigation of women with PMB; it provides tissue for histological diagnosis, while it causes only minor discomfort in the majority of women. Overall, EB has a high accuracy in diagnosing endometrial cancer with a detection rate up to 99.6%. The adequacy of the specimens is comparable to D&C (83.3%), but D&C has a higher complication rate. Moreover, on comparing the histological findings with that of the subsequent hysterectomy specimens, the sensitivity of EB was 97.5%. However, other studies showed that it results in inadequate samples in up to 5–16% of cases, and its sensitivity in detecting endometrial hyperplasia could be as low as 67%. Also, EB can miss up to 18% of focal lesions, such as endometrial polyps, and it has a false negative rate of up to 15%. Nonetheless, EB can be used safely and effectively as the first diagnostic step in PMB.

INVESTIGATING WOMEN WITH POSTMENOPAUSAL BLEEDING

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TVS is a safe, highly effective, generally painless and non-invasive diagnostic test that helps to reliably determine endometrial thickness and uterine morphology. Also, it helps in evaluating the pelvic organs for any other potential abnormalities, such as ovarian or tubal malignancy which may, also, present with PMB. Good Clinical Care.

Transvaginal ultrasound scanning (TVS)

TVS is a safe, highly effective, generally painless and non-invasive diagnostic test that helps to reliably determine endometrial thickness and uterine morphology. Also, it helps in evaluating the pelvic organs for any other potential abnormalities, such as ovarian or tubal malignancy which may, also, present with PMB. Studies suggest that an endometrial thickness of ≤5mm is rarely associated with endometrial cancer. Using an endometrial thickness of 5mm, the sensitivity for detecting endometrial disease is 92% and the sensitivity for detecting cancer is 96% with a false negative rate of 8%; indicating that TVS is an excellent tool for determining whether an endometrial biopsy is necessary.

Saline infusion ultrasonography (SIS)

Saline infusion ultrasonography (SIS) is a well tolerated and a cost-effective diagnostic test for investigating women with PMB as it can reliably distinguish between focal and diffuse endometrial lesions, especially endometrial polyps. The positive and negative predictive values of SIS were estimated to be 91% and 92%, respectively. However, SIS is more expensive than TVS, needs greater expertise and may have contraindications in some clinical situation, such as cervical stenosis and pelvic infection.

Hysteroscopy

Hysteroscopy is a reliable diagnostic test in evaluating women with PMB with 90% sensitivity, 94% specificity, 92% positive predictive value and 96% negative predictive value. Moreover, it allows direct visualisation of the endometrial cavity and removal of any lesions, such as polyps.

Nevertheless, hysteroscopy has a false negative rate of 3%, and it is an invasive, expensive procedure and may facilitate the spread of malignant cells into the peritoneal cavity.

Outpatient hysteroscopy has less serious complications and little failure rate; hence, it should be offered to all non-obese and medically low-risk women. The newer smaller flexible office hysteroscopes enable hysteroscopy to be performed without anaesthesia and even removing polyps under local anaesthetic.

INVESTIGATING WOMEN WITH POSTMENOPAUSAL BLEEDING

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Answers to the problem-based clinical scenario

A. List 5 more questions you would like to ask her

1. Is she on HRT or tamoxifen for breast cancer?
2. Is this bleeding postcoital?
3. When was her last cervical smear and is there any history of previous abnormal smears?
4. Is she sure that the discharge is coming from the vagina?
5. Does she use a pessary for vaginal prolapse?

B. List your differential diagnosis

The most common cause is atrophic changes, however, rule out: exogenous hormones, endometrial or cervical polyps, endometrial hyperplasia and endometrial cancer.

C. List the investigation you might request

1. Endometrial sample.
2. Transvaginal scan.
3. Hysteroscopy.
4. Cervical smear if no recent one.

Conclusion

Women with PMB should be referred and investigated promptly to rule out any potential malignancy. After obtaining a comprehensive history and performing a full clinical examination, a transvaginal scan with endometrial biopsy should be used as the first line of investigation. When there is an endometrial thickness of >5mm and where an intrauterine lesion was diagnosed on TVS, or when TVS and/or EB are inconclusive, hysteroscopy should be used as a second line investigation. However, the management of women with PMB should be individualised and integrated into the women's characteristics. Therefore, hysteroscopy should be offered as a first line investigation to women with high-risk factors, such as older, obese or diabetic women, those with recurrent PMB, exogenous or tamoxifen users or women with family history of endometrial cancer.

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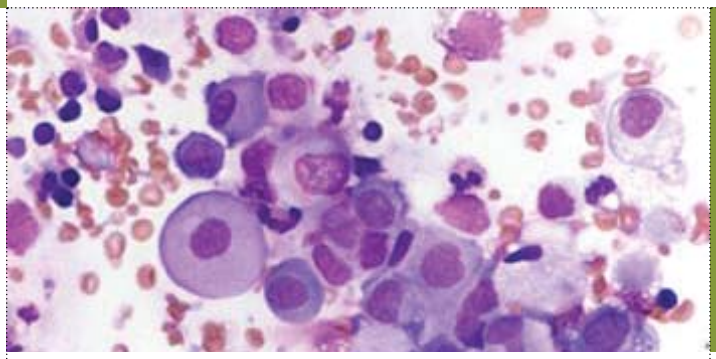
CERVICAL INTRAEPITHELIAL NEOPLASIA, SCREENING AND COLPOSCOPY

Janaki Putran and MA Khaled



A 38-year-old woman attended her local GP practice for a routine cervical smear. The smear result came back as severe dyskaryosis. Good Clinical Care.

A 38-year-old woman attended her local GP practice for a routine cervical smear. The smear result came back as severe dyskaryosis. She was referred to the colposcopy clinic. On colposcopy examination, the entire squamo-columnar junction was seen. An aceto–white area was seen on application of acetic acid. Colposcopy examination suggested a high-grade lesion. The woman underwent a loop excision of the transformation zone under local anaesthetic. The biopsy confirmed CIN 3 with complete excision of margins.

Introduction

Cervical cancer is one of the leading causes of morbidity and mortality worldwide. The leading causes of death among women worldwide are breast, lung, stomach, colorectal and cervix cancer. About 80% of all cervical cancers and related death occur in developing countries (see Figure 1)[1].

Unfortunately, 2,803 women were diagnosed with cervical cancer in the UK in 2005 and 949 deaths were reported in the year 2006.

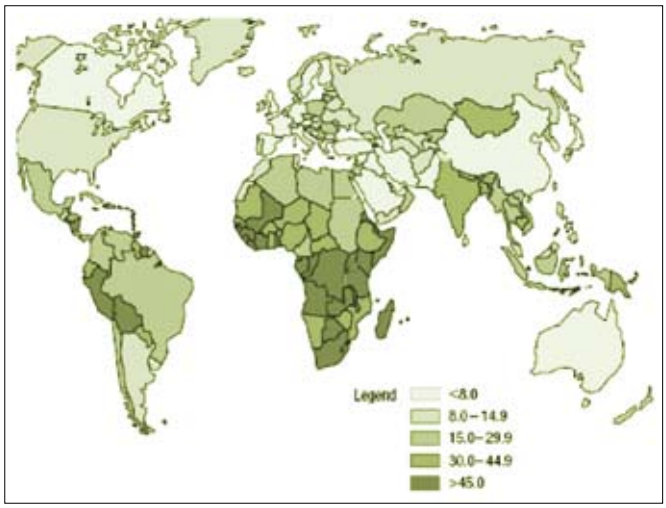


Figure 1: Worldwide incidence of cervical cancer per 100,000 women in 2005 (WHO).

Etiology of cervical intraepithelial neoplasia (CIN) and cervical cancer

The primary cause of cervical squamous carcinoma is persistent or chronic infection with high-risk subtypes of the human papilloma virus (HPV). The HPV is a DNA virus that can cause a variety of lesions from genital warts, laryngeal papilloma to cancer. Subtypes 16 and 18 are found in 70% of all cervical carcinomas. Other oncogenic HPV subtypes are 31, 34, 58 and 59.

Other compounding factors for cancer of the cervix are smoking, the use of the oral contraceptive pill for more than 5 years and HIV infection.

Natural history of cervical intraepithelial neoplasia (CIN)

Persistence of HPV is the main reason for the development of CIN. The lifetime risk of a woman acquiring HPV infection is about 79%. Cervical HPV in individual women may regress, persist, progress or recur. The natural history of CIN follows a pattern similar to that of HPV (see Table1).

Lesion	Regression %	Persistence %	Pro-gression to CIN 3 %	Pro-gression to Invasive Ca %
CIN 1	57	32	11	1
CIN 2	43	35	22	5
CIN 3	32	<56		>12

Table 1: Natural history of CIN over 9 years.

Ninety per cent of CIN arise in the transformation zone of the cervix and are squamous in origin (see Figure 2). The transformation zone is that part of the cervix that lies between the original squamo-columnar junction and the new squamo-coloumnar junction. The new squamo-columnar junction changes position during a women's lifetime.

The other 10% arise from the cervical glandular epithelium and is called cervical glandular intraepithelial neoplasia (CGIN).

CERVICAL INTRAEPITHELIAL NEOPLASIA, SCREENING AND COLPOSCOPY

Janaki Putran and MA Khaled

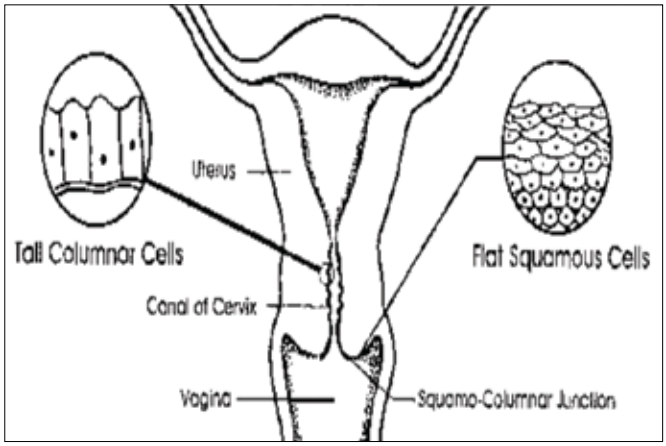


Figure 2: Anatomy of the cervix.

CIN is classified as CIN 1, 2 or 3 depending on the depth of epithelium that is dysplastic (see Figure 3). Progression from a lower to a higher grade usually takes years.

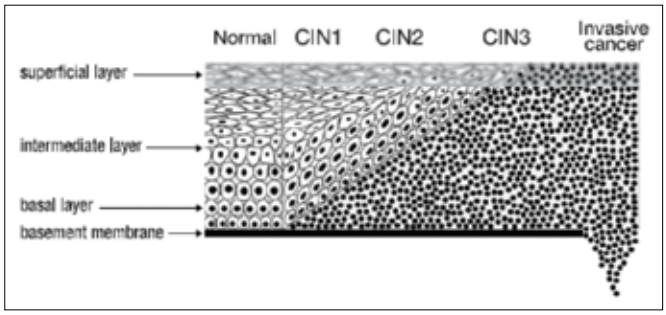


Figure 3: Progression of CIN.

The NHS cervical screening programme

The NHS cervical screening programme was introduced in the UK in 1988. This is a computerised call–recall system for all eligible women residing in the UK. The programme has reduced rates of cervical cancer in the UK by 50% since its introduction. It covers about 80% of the eligible population at an annual cost of £130 million.

All women aged 25 years to 64 years are offered screening by cervical smears (see Table 2). Smears are taken with a cervix brush and suspended in a liquid buffer (liquid-based cytology or LBC). The buffer can also be used for HPV testing.

Age group in years	Frequency of screening
25	First Invitation
25–49	3 yearly
50–64	5 yearly
65+	Only those who have had recent abnormal smears or not screened since age 50

Table 2: Age group for screening.

Cervical smears are reported as normal, inadequate, borderline dyskaryosis, mild dyskaryosis, moderate dyskaryosis, severe dyskaryosis, glandular dyskaryosis or possible invasion.

Women with abnormal cervical smears are referred on to specialist clinics for colposcopy examination (see Table 3).

Smear result	Time within which women are seen in colposcopy clinic – weeks
Inadequate x 3	8
Borderline squamous x 3	8
Mild x 1	8
Moderate x 1	4
Severe x 1	4
Glandular	2
Possible invasion	2

Table 3: Referral guidelines for colposcopy.

Colposcopy

The colposcope is a binocular microscope that magnifies the cervix by 10 to 50 times. Acetic acid 3–5% is used to paint the cervix and identify abnormal areas. Lugol's iodine is then applied to identify iodine negative areas. On colposcopy, the lesions are classified as low grade or high grade. The transformation zone of the cervix is classified as type 1, 2 or 3.

At colposcopic examination, if an abnormal area is identified, the usual policy is to take directed biopsies. This may be a punch biopsy or a loop biopsy.

Treatment of CIN

Treatment of CIN can usually be performed in the outpatient clinic under local anaesthetic. These include the large loop excision of the transformation zone (LLETZ), cryocautery, cold coagulation and laser ablation.

Treatment of CGIN is usually by an excision biopsy either with a loop diathermy or laser.

CERVICAL INTRAEPITHELIAL NEOPLASIA, SCREENING AND COLPOSCOPY

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Follow-up

Women with CIN 1 are followed-up with cervical smears for 2 years at 6, 12 and 24 months interval. Women with CIN 2, 3 and with CGIN are followed-up with cervical smears at 6 and 12 months and then yearly for up to 10 years.

The HIV positive woman

All women who are HIV positive are at a higher risk of cervical cancer. They are offered yearly cervical smears.

The pregnant woman

Routine cervical smears in pregnancy are not indicated. If a woman with an abnormal smear result falls pregnant, she should be seen in the colposcopy clinic as per guidelines. The aim of colposcopy examination is to exclude invasive disease. Biopsy and treatment are deferred until the woman has delivered.

HPV vaccine

Two types of vaccine against HPV are currently available. The quadrivalent vaccine protects against HPV 6, 11, 16 and 18. This vaccine aims to prevent genital warts and 70% of carcinoma's of the cervix. The bivalent vaccine protects against HPV 16 and 18. This vaccine is currently being offered to all girls in the UK aged 12 and 13 years.

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CAREERS IN OBSTETRICS AND GYNAECOLOGY

Ketan Gajjar and Jonathan Evans Jones

Obstetrics and gynaecology is a combination of two distinct but related medical specialities. Obstetrics involves the creative process of childbirth and all its problems either medical or surgical, while gynaecology covers a wide variety of subjects from infertility to incontinence and oncology.
Good Clinical Care.

Obstetrics and gynaecology is a combination of two distinct but related medical specialities. Obstetrics involves the creative process of childbirth and all its problems either medical or surgical, while gynaecology covers a wide variety of subjects from infertility to incontinence and oncology. A career in obstetrics and gynaecology is flexible, exciting and rewarding, at times demanding and stressful but always varied and challenging. Unsuccessful outcomes will always have a devastating effect on the parents or relatives irrespective of the specialty, but particularly in this specialty. However, your knowledge and skills along with sympathy and empathy can make a lifetime difference to their experience even in such a difficult time. You will be involved in night duty rotas and learn to deal with stressful situations and rapid decision-making. However, with the full implementation of the European Working Time Directive (EWTD) in the future it is likely that the life of the consultant will be more predictable, allowing more time for the family and for their own other interests.

What is obstetrics and gynaecology?

Obstetrics and Gynaecology (O & G) includes women's health problems that may occur in childhood and adolescence, through pregnancy and childbirth to the care of the postmenopausal woman. The role of the obstetrician and gynaecologist is to ensure the appropriate provision of high quality care and to provide support, information and advice to women to enable them to attain and maintain optimal health. Obstetrics and gynaecology is a rapidly evolving specialty. It is an area that led to the development of a number of innovative techniques which have spread to other specialties.

Common procedures / interventions

Within obstetrics, most uncomplicated deliveries are performed by midwives, but all obstetricians are also able to carry out a normal delivery. Assisted or instrumental delivery is sometimes needed, as is Caesarean section, either as an emergency or planned procedure. Within gynaecology, operative procedures range from those related to problems such as miscarriage and abnormal menstrual bleeding to major abdominal surgery in the event of gynaecological cancers. Minimal access surgery for problems such as endometriosis has enabled specific treatments to be introduced for these conditions.

What is an average day like?

The working day usually starts at 8am with a ward round, seeing inpatients, new admissions from overnight and arranging any required investigations. This might be followed by an antenatal or gynaecology outpatient clinic. The afternoon could involve an operating theatre list, a scanning clinic or cover for the labour ward. There is no typical day, but this is what makes the specialty varied and interesting. Trainees could be responsible for seeing emergencies in the labour ward or work in gynaecology without other commitments during the day or night.

Why to choose obstetrics & gynaecology?

Obstetrics and gynaecology is a practical specialty allowing early involvement of trainees in quite complex procedures, supervised by the consultants. There are plenty of choices of sub-specialties, ranging from surgical specialties, such as oncology and urogynaecology, through to foetal and maternal medicine. The flexibility of this unique and challenging specialty allows you to develop a wide range of skills and interests. Obstetrics and gynaecology is currently undersubscribed, which creates the opportunity for you to work in the field of your interest. Flexible training is possible and when you become a consultant, private practice is possible. A survey[1] of medical students and junior doctors found that the main attractions were a mixture of medicine and surgery (23%), interest in the specialty itself (21%), job satisfaction (17%), broad choice of activities (13%) and that the main deterrents were current working hours, conditions and shifts (25%), fear of litigation (13%) and a bad undergraduate experience (11%). Patient expectation, partly led by politicians and the media, together with increased litigation costs, has recently necessitated increased consultant involvement in labour wards. Litigation is increasing but this is also true for all other specialties in medicine.

What is most enjoyable?

Specialists enjoy the variety of the working day, the vast range of opportunities that exist within the specialty and the support of co-workers. The specialty offers career development across all aspects of medicine and surgery according to opportunity and aptitude. The potential to be involved in really groundbreaking areas of work and to make a huge difference to people's quality of life is also very rewarding.

CAREERS IN OBSTETRICS AND GYNAECOLOGY

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What is most challenging?

Obstetrics and gynaecology is seen as an acute specialty and like other such specialties it can be unpredictable and sometimes busy. Trainees will usually be working in a large team with a clear support structure which is important, especially in the early part of training. As with many other specialties, patients sometimes have complex and challenging issues which can be difficult to resolve. However, seeking guidance and support from peers and supervisors often helps in these situations. Many such patients are managed as part of a multidisciplinary team (MDT).

Entry, qualifications & training (training scheme)

It is without doubt that the last few years have been very turbulent in terms of postgraduate medical training and obstetrics and gynaecology is no exception. Since 2003, medical education and training in the UK has gone through radical reform under the Modernising Medical Careers programme. Following the well documented problems with the Medical Training Application Service (MTAS), and other issues around the introduction of Modernising Medical Careers (MMC) in 2007, last year has been one of review, reflection and wide-ranging debates on the way forward. Following on from there, coordination of the application and recruitment process into obstetrics and gynaecology is now run by the RCOG, through the use of the "ObsJobs" website[2] (**http://obsjobs.rcog.org.uk**).

The specialty training has become known as the "run-through grade", as there will no longer be senior house officer and registrar grades but rather one grade of specialty trainee (ST), with progression through to the award of the Certificate of Completion of Training (CCT). Progression through specialty training will be dependent upon achieving set competencies at all levels of training and success in the regional in training assessments (RITAs). Obstetrics and gynaecology specialty training will last for 7 years, divided into separate sections, each with its own assessment requirements for progression[1].

Foundation Year posts exists in the format of a "women's health" module. The curriculum for this module allows trainees to gain the generic skills needed as part of the Foundation Year programme. You can also gain skills that you can develop if you decide to follow a career in obstetrics and gynaecology later, although it is not a compulsory requirement.

Specialty training in obstetrics and gynaecology consists of basic (ST1 and ST2), intermediate (ST3 to ST5) and advanced training (ST6 and ST7). Doctors who have successfully completed Foundation training, and those with equivalent competences (1 year of satisfactorily completed SHO training in the UK), will be able to compete for entry at ST1. Successful applicants will be appointed to a 2-year basic specialty training (BST) programme within Deanery-organised programmes. Once appointed the trainees must join the Trainees Register at the RCOG.

The first two years of specialty training, ST1 and ST2, are equivalent to the old SHO posts. You will acquire generic skills and competencies in obstetric and gynaecological practice and have a set of competencies to manage acute obstetric and gynaecological presentations as the resident on-call doctor. The basic training parts of the RCOG logbook must be completed and signed off before progressing to ST3. To progress from basic to intermediate training you will need to demonstrate specified competencies linked to the curriculum for Basic Specialty training (BST) and confirmed by completion of a range of assessments, including knowledge (MRCOG Part 1) and a satisfactory Record of In Training Assessment (RITA). The RCOG is currently piloting the eportfolio for ST1 trainees in all Deaneries and ST2 trainees in some Deaneries. The eportfolio may replace the paper-based assessment in the future.

ST3 trainees are expected to take more responsibility on the labour ward and to work as a registrar under indirect supervision out of hours. ST3 doctors should be able to manage common obstetric emergencies and be able to plan treatment for more complex cases and gynaecological emergencies; ST4 and ST5 carry on their core training and must complete the intermediate sections of their logbooks. Progress through intermediate (ST3, ST4 and ST5) into advanced training (ST6 and ST7) will require satisfactory acquisition and assessment of clearly defined competencies and a summative clinical assessment.

In the final 2 years, core skills will continue to be developed to the point of independent practice, you will develop special interest and you will undertake at least two Advanced Training Skills Modules (ATSM). Modules are based on the diversity of training and service needs. There are 20 ATSMs which are listed in Table 1. A single skills module consists of 50–100 dedicated sessions spread over 1 or 2 years. This training will be organised by you, with advice from the Deanery specialty training committee. Trainees will need to identify which advanced skills modules are available in their region at the end of ST4 assessment and apply during the 5th year of training so that modules can be started at the beginning of their advanced training.

You can apply for a sub-specialty training post any time after you have completed the Postgraduate Training Manual and passed Part 2 of the MRCOG examination. A few skilled and motivated trainees can be selected into one of the five sub-specialties (gynaecological oncology, maternal and foetal medicine, reproductive medicine, urogynaecology, sexual and reproductive health). Sub-specialty training takes place during ST6 and ST7.

CAREERS IN OBSTETRICS AND GYNAECOLOGY

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Foetal Medicine	Vulval Disease
Benign Vaginal Surgery	Acute Gynaecology and Early Pregnancy
Advanced Labour Ward Practice	Abortion Care
Benign Gynaecological Surgery: Laparoscopy	Gynaecological Oncology
Labour Ward Lead	Sexual Health
Benign Gynaecological Surgery: Hysteroscopy	Sub-fertility and Reproductive Endocrinology
Maternal Medicine	Menopause
Colposcopy	Urogynaecology
Advanced Antenatal Practice	Paediatric and Adolescent Gynaecology
Benign Abdominal Surgery	Medical Education

Table 1: List of ATSM.

Personal qualities needed

The majority of specialties in medicine require hard work and commitment and obstetrics and gynaecology is no different. The ability to adapt to rapidly changing situations is essential and a sense of humour is useful when you are faced with difficult situations. Your day might start doing the gynaecology clinic and it may well end with a major obstetric haemorrhage. The ability to adapt to rapidly changing situations is therefore essential. Enthusiasm, agility and an intention to enjoy life are key features for this role.

Other qualities required are:

- ability to make decisions under pressure
- good communication skills
- mental and physical stamina
- ability to cope with your own stress and that of others
- leadership abilities
- ability to work as a member of a team
- ability to sympathise and be non-judgemental
- manual dexterity

Flexible training

If you wish to work part time, this can be achieved through flexible training posts funded by your regional postgraduate dean or by job-sharing. Approximately 20% of trainees use flexible training schemes but it is anticipated that demand from trainees of both genders will increase in the future. You can still take up a full-time appointment or stay in part-time appointments later in your career. Job-sharing posts are arranged by individual NHS trusts or departments. The RCOG has an advisor on flexible training, who can give you more information.

Academic training

Academic training in obstetrics and gynaecology is essential for the future development of the specialty. Career paths in academic medicine have recently been redefined to enable access to academic training at all postgraduate levels.

A number of academic Foundation Year posts will provide interested trainees with a "taste" of academia, while dedicated academic training programmes now exist to enable academic training to run alongside normal clinical training.

CAREERS IN OBSTETRICS AND GYNAECOLOGY

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How to increase your chances of getting into this specialty

If you are interested in obstetrics and gynaecology as a career, we encourage you to apply for a Foundation programme that includes women's health, although it is not a prerequisite for application to enter into specialty training. Evidence of interest in obstetrics and gynaecology would be an advantage (e.g. student elective) but enthusiasm for the specialty is the most essential requirement. Many of the Foundation Year 2 and a few Year 1 posts include obstetrics and gynaecology, and it is wise to spend this time doing an audit or some teaching to improve your CV. At present, the Part 1 examination for membership of the Royal College of Obstetricians and Gynaecologists can be taken as soon as you get your medical degree. An early successful attempt will mark you out as an enthusiast in the specialty.

What does the future hold for this specialty?

The need to comply with the European Working Time Directive has meant an increase in the number of consultants, and the increased numbers will need to be maintained to balance the numbers of consultants retiring or moving into other specialties. Currently, the UK has about 1,500 consultants in obstetrics and gynaecology. It is expected that 1,000 more consultant posts will be created over the next decade or so[3, 4]. Flexibility in training is greater than ever, and the Royal College of Obstetricians and Gynaecologists is pursuing many changes to improve training, with particular regard to part-time training posts. The college is also keen to develop a strong, clear academic career pathway for budding academics to combine clinical training and research from early years – just after the Foundation Year training. The future consultant's role is being redefined and restructured with a work–life balance in mind. The service demands of the NHS will require most future consultants provide an obstetrics and emergency gynaecological service, while only a few will do major gynaecological surgery. Therefore, the future consultant is likely to be one who enjoys the job more, will be rewarded better for the on-call commitments than at present, and will have shorter working hours.

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DIFFERENTIAL DIAGNOSIS OF COMMON SYMPTOMS IN PREGNANCY

Suzanna Daud, Fadi Alfhaily and MA Khaled

Asthma can cause breathlessness, which is often associated with a cough with or without wheezy breathing. The symptoms are usually worse at night, on walking and after exercise.
Good Clinical Care.

Objectives

1. To recognise the different causes of common symptoms during pregnancy.
2. To outline the different investigations used to diagnose the causes of these symptoms.

Breathlessness

Case based discussion 1

A 38-year-old pregnant woman, at term in uncomplicated labour suddenly becomes breathless and develops central chest pain then collapses; during the resuscitation, you notice extensive bruising on her body.

What is the most likely diagnosis?

Amniotic fluid embolus is a rare complication of pregnancy, typically occurring during otherwise uncomplicated labour. If foetal squames are found in central blood or maternal sputum, this supports the diagnosis. Typically, the presentation is a sudden collapse requiring resuscitation; the condition has a high mortality rate. DIC is a common complication and could reveal itself as bruising or bleeding.

Breathlessness is a common physiological symptom in normal pregnancy that can occur at any stage of pregnancy but more commonly in the third trimester. Almost 50% of pregnant women are aware of breathlessness, even before 20 weeks gestation and this may be apparent at rest or when speaking. However, the diagnosis of physiological breathlessness should be made only by exclusion of other causes, such as anaemia, asthma, pulmonary embolus (PE), cardiac cause, pneumonia, pneumothorax and hyperventilation or anxiety.

The evaluation of breathlessness should be based on a careful history and clinical examination and performing the appropriate investigations, which may include chest X-ray, electrocardiograph (ECG) and echocardiogram.

Pregnancy is commonly associated with anaemia. However, anaemia may not be responsible for breathlessness until it is severe and may be associated with lethargy. A full blood count (FBC) should be taken to assess the haemoglobin level in cases of suspected anaemia.

Asthma can cause breathlessness, which is often associated with a cough with or without wheezy breathing. The symptoms are usually worse at night, on walking and after exercise. Diagnosis is made based on history and response to inhaled bronchodilator is the confirmatory feature. Monitoring of Peak Expiratory Flow Rate (PEFR) at home is useful to look for diurnal variation and morning "dipping" which would be suggestive of asthma.

Thromboembolic disease can occur at any stage of the pregnancy but the puerperium is the time of the highest risk. There is also a higher risk of pulmonary embolus in obese women, women with previous history of thromboembolic disease or thrombophilia and prolonged immobility, such as after Caesarean sections or instrumental delivery. The subjective clinical assessment of pulmonary embolus is particularly unreliable in pregnancy. However, it can cause sudden onset of breathlessness associated with pleuritic or central chest pain. Symptoms can be worse after exercise and may be associated with haemoptysis. Women may have tachycardia and increased jugular venous pressure (JVP) on examination. The ECG may show sinus tachycardia, tall peaked P wave in lead II and signs of right heart strain (S1, Q3, T3). Chest X-ray often is normal but may also show pleural effusion, oligaemia and wedge-shaped infarct. Arterial blood gases (ABG) will reveal hypoxaemia and hypocapnia. The definitive test for diagnosing PE is either a V/Q (ventilation/perfusion) scan or CTPA.

Cardiac causes of breathlessness are relatively uncommon, however, mitral stenosis and peripartum cardiomyopathy may present with breathlessness.

Women with mitral stenosis are usually asymptomatic at the beginning of pregnancy but breathlessness can happen due to the pulmonary oedema which is a particular risk immediately following delivery. It may be associated with orthopnoea, paroxysmal nocturnal dyspnoea and haemoptysis. A mid-diastolic murmur may be difficult to hear on examination. ECG, chest X-ray and echocardiogram are the necessary investigations to reach the diagnosis. Peripartum cardiomyopathy is usually more common in the first month after delivery, however, it can also present antenatally. It is more common in older, black, multiparous women, with multiple pregnancies, pre-eclampsia or hypertension. It causes breathlessness associated with symptoms and sign of biventricular failure, such as tachycardia, pulmonary and peripheral oedema. Pneumonia causes breathlessness that often, but not invariably, is associated with productive cough, pleuritic chest pain and fever. Investigations of choice include FBC, blood culture, sputum culture and chest X-ray. In cases where a typical pneumonia is suspected then, serology testing is needed.

DIFFERENTIAL DIAGNOSIS OF COMMON SYMPTOMS IN PREGNANCY

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Pneumothorax may cause sudden onset of pleuritic chest pain and breathlessness immediately following spontaneous vaginal delivery. Look for surgical emphysema on examination which could give a clue of the diagnosis. Chest X-ray is the investigation of choice.

Hyperventilation and anxiety cause breathlessness which may be associated with parasthesiae of the hands or around the mouth. Arterial blood gases (ABG) shows hypocapnia without hypoxaemia.

Palpitations

Case based discussion 2

A 35-year-old lady at 20 weeks gestation was referred to an Early Assessment Unit with history of prepregnancy palpitations which were getting slightly worse. A previous echocardiogram is showing a posterior movement of the mitral valve cusp during systole and during auscultation a mid-systolic click was found.

What is the diagnosis?

Mitral valve prolapse.

Table 1 shows the most common causes of palpitations during pregnancy. Useful investigations for diagnosis include: ECG, FBC, thyroid function test, echocardiogram, Holter monitor, 24-hour urinary catecholamines and ultrasound of the adrenal glands.

Atrial and ventricular premature beats are common. However, they, fortunately, have no adverse effect on mother or foetus. They cause a thumping sensation which leads to symptoms of palpitation. They occur more commonly at rest and are often relieved by exercise.

Physiological adaptation during pregnancy may cause the heart rate in healthy pregnant women to increase 10–20bpm. However, sinus tachycardia (ST) requires selective investigation to rule out respiratory causes, such as asthma and PE; cardiac causes, such as mitral stenosis and peripartum cardiomyopathy; hypovolaemia, such as due to bleeding; sepsis; SVT; thyrotoxicosis and phaeochromocytomas.

The most common type of supraventricular tachycardia (SVT) is the paroxysmal SVT. It usually predates the pregnancy, however, it may become more frequent in the course of the pregnancy. It may be due to pre-excitation from accessory pathways, such as Wolff-Parkinson-White syndrome.

All cases of documented ST, SVT, atrial fibrillation or atrial flutter should have a thyroid function test (TFT) to rule out thyrotoxicosis.

Phaeochromocytomas is a dangerous condition. Fortunately the incidence is rare. It causes symptom of palpitation associated with hypertension, headache, sweating and anxiety. Attack may occur while the patient is in a supine position.

Chest pain

Case based discussion 3

A 42-year-old woman at 34 weeks in her second pregnancy attended A&E feeling unwell, suddenly she becomes dyspnoeic and develops central chest pain before collapsing; during the resuscitation, you are told that she has had hypertension for several days.

What is the likely diagnosis?

Myocardial infarction is rare in pregnancy, however, its prevalence is gradually increasing as more women with risk factors for cardiovascular disease became pregnant. In pregnancy, cardiovascular changes with the extra work of the heart increases markedly in the first trimester and then again in labour. Once the diagnosis is suspected, it should be confirmed by ECG changes, measuring blood troponin levels and cardiac enzyme, in the normal way.

The differential diagnosis of a woman presenting with chest pain in the pregnancy are shown in Table 2.

Investigations that may help to reach the correct diagnosis include: chest X-ray, ECG, ABG, V/Q scan or CTPA, sputum culture, white blood cell count, troponin and cardiac enzymes, chest magnetic resonance imaging (MRI) and echocardiogram.

Musculoskeletal pain is not uncommon in pregnancy. It may cause chest pain that is related to the movement of the arms and torso. There can be localised chest wall tenderness. Infection with Coxsackie B virus can cause chest pain due to the involvement of the intercostal muscles.

Gastro-oesophageal reflux is, also, a common problem in pregnancy. Generally, it is worse in the later part of pregnancy. The chest pain is related to eating and usually retrosternal; commonly described as being sharp and burning. It is also worse at night due to the recumbent position, may be associated with water brash and regurgitation and often responds to antacids.

Classically, ischaemic and cardiac pain is described as central crushing chest pain that radiates to the neck and the left arm and usually worsens on or is precipitated by exercise. It occurs more commonly in a smoker and someone with diabetes.

Aortic dissection causes severe chest pain that may radiate to the back and is associated with systolic hypertension. Symptoms and signs are from the territory supplied by the coronary, carotid, subclavian, spinal or common iliac arteries or aortic regurgitation.

DIFFERENTIAL DIAGNOSIS OF COMMON SYMPTOMS IN PREGNANCY

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Hypertension

Case based discussion 4

1. A 34-year-old primiparous women is found to have a blood pressure of 150/94mm Hg at 39 weeks gestation; urinalysis shows trace proteinuria and 1+ glycosuria. Her booking blood pressure was 126/74mm Hg at 9 weeks gestation.

The most likely reason for a new onset hypertension in the late third trimester in the absence of significant proteinuria is pregnancy-induced hypertension. 1+ glycosuria is common and non-pathological in pregnancy.

2. A 21-year-old primiparous woman is found to have a booking blood pressure of 132/76mm Hg and normal urinalysis at 10 weeks gestation. At 34 weeks gestation, she found to have a blood pressure of 162/98mm Hg; urinalysis shows 2+ proteinuria.

New onset hypertension in the third trimester with new onset proteinuria in a young primiparous woman is most likely to be pre-eclampsia.

3. A 33-year-old woman is found to have a booking blood pressure of 152/94mm Hg and urinalysis shows 2+ protein and 3+ blood at 9 weeks gestation. Serum creatinine is 163µmol/L and serum potassium is 4.9 mmol/L.

Pre-existing hypertension with renal impairment and both haematuria and proteinuria points to a diagnosis of underlying renal disease. Haematuria would support a diagnosis of SLE.

Hypertension in pregnant women can be due to:

- essential hypertension
- pregnancy induced hypertension (PIH)
- pre-eclampsia
- renal hypertension
- cardiac hypertension/coarctation of the aorta
- Cushing's syndrome
- Conn's syndrome
- white-coat hypertension
- phaeochromocytomas.

The useful investigations to help in diagnosis include: FBC and coagulation profile, urea and electrolytes (U&Es), liver function test (LFT), ACTH, cortisol, dexamethasone suppression test, plasma rennin and aldosterone, creatinine clearance, urinalysis and microscopy, 24-hour catecholamines, 24-hour urine protein and protein/creatinine ratio, renal scan or a scan (CT or MRI) of adrenal or pituitary, echocardiogram, chest X-ray and pelvic ultrasound for foetal growth.

Women with essential hypertension usually present with a history of hypertension that predates the pregnancy. They may also have a positive family history of hypertension. It is more common in Afro-Caribbean and older women. However, superimposed PET and PIH may happen.

Pre-eclampsia (PET): This is pregnancy-induced hypertension with proteinuria (more than 0.3g in 24 hours) with or without oedema, and virtually any organ system may be affected. Clinical features of severe pre-eclampsia include: severe headache, visual disturbance, epigastric pain and vomiting. Clinical examination may reveal signs of brisk reflexes and clonus, liver tenderness and papilloedema.

Pregnancy induced hypertension (PIH) occurs usually after 20 weeks gestation, however, there are no associated features of PET, and usually settles after 6 weeks post delivery; but, often recurs in subsequent pregnancies.

In renal hypertension, there may be associated proteinuria, haematuria, renal impairment and active urinary sediment. It may occur in women with reflux nephropathy, diabetes, polycystic kidney disease and renal artery stenosis. Whereas, in cardiac hypertension (such as due to coarctation of the aorta), there is femoral-radial delay or weak femoral pulses.

Cushing's syndrome causes hypertension that is associated with excessive weight gain, extensive purple striae, impaired glucose tolerance or diabetes mellitus, easy bruising, hirsutism, acne or proximal myopathy. In Conn's syndrome there is the characteristic feature of hypokalaemia. Whereas, phaeochromocytomas are associated with other features, such as palpitation, anxiety, sweating, headache, vomiting and glucose intolerance, and the blood pressure can be sustained or labile with occurring paroxysms in 50% of cases.

DIFFERENTIAL DIAGNOSIS OF COMMON SYMPTOMS IN PREGNANCY

Suzanna Daud, Fadi Alfhaily and MA Khaled

Collapse

Case based discussion 5

A 44-year-old obese woman who had instrumental delivery suddenly becomes dyspnoeic and develops central chest pain before collapsing; during the resuscitation, you notice that she has Q waves in the lead III of the electrocardiogram (ECG).

The most likely diagnosis is pulmonary embolism.

Pulmonary embolism is the leading direct cause of maternal mortality in the UK and should always be considered when a pregnant woman collapses especially in the post-partum period. The classical ECG changes of an S wave in lead I and a Q wave plus inverted T wave in lead III of the ECG are non-specific and can occur in normal pregnancy.

The differential diagnosis of collapse in pregnancy is shown in Table 3.

Amniotic fluid embolism (AFE) typically occurs during or immediately following a precipitus labour even with an intact amniotic sac. Predisposing factors includes age, hypertonic uterine contraction, uterine stimulants, uterine trauma and induced labour. Women who have AFE will also have profound shock, respiratory distress and cyanosis.

In AFE, severe post-partum haemorrhage (PPH) is usually due to developing disseminated intravascular coagulation (DIC) and the prognosis is usually poor.

Tonic-clonic seizures are usually followed by post-ictal drowsiness.

Haemorrhage can be due to obstetric or non-obstetric cause and it can present as partially or totally concealed and may be complicated with DIC.

Women who have a subarachnoid haemorrhage may present with collapse that might be preceded by the sudden onset of severe, often occipital, headache. It is also associated with vomiting, neck stiffness, loss of consciousness and papilloedema. Also, focal neurological signs are often, but not invariably, present.

In women with underlying eclampsia, the collapse due to cerebral haemorrhage is likely to occur during the post-partum period. However, those women who have arterial venous malformation may collapse during the antenatal period. Most ischaemic strokes that are associated with pregnancy are in the distribution of carotid and middle cerebral arteries, and can occur in the first week after delivery of the baby.

Cavernous venous thrombosis (CVT) usually causes collapse during the post-partum period. It is associated with headache, vomiting, seizures, photophobia, impaired consciousness and signs of raised intracranial pressure (ICP). As many as 30% to 60% of women have focal signs, such as hemiparesis, which may be transient. CVT may also cause fever and leukocytosis.

Dizziness

The differential diagnosis in women presenting with dizziness includes:

- anaemia
- postural hypotension
- supine hypotension
- labyrinthitis
- cardiac cause.

Women presenting with postural hypotension feel dizziness after prolonged standing or when standing from a sitting or lying position. Nevertheless, it is also a side effect of methyldopa.

Supine hypotension usually causes symptom of dizziness late in the second and third trimesters. It is due to the direct pressure on the inferior vena cava (IVC).

Labyrinthitis can cause symptoms of dizziness associated with vomiting, vertigo and nystagmus. Dizziness usually occurs after moving the head particularly from sitting to supine position.

Cardiac problems that can cause symptoms of dizziness in pregnant women include arrhythmia, aortic stenosis and hypertrophic cardiomyopathy. Useful investigations to help determine the correct diagnosis include ECG, echocardiogram and Holter monitor.

Table 1
Physiological
Ectopic beats
Sinus tachycardia
Supraventicular tachycardia (SVT)
Thyrotoxicosis
Phaeochromocytomas

Table 1: Differential diagnosis of palpitation in pregnancy.

DIFFERENTIAL DIAGNOSIS OF COMMON SYMPTOMS IN PREGNANCY

Suzanna Daud, Fadi Alfhaily and MA Khaled

Table 2
Musculoskeletal pain
Gastro-oesophageal reflux
PE
Pneumonia/pleurisy
Pneumothorax
Ischaemic heart disease
Aortic dissection

Table 2: Differential diagnosis of chest pain in pregnancy.

Table 3
Pulmonary embolism (PE)
Amniotic fluid embolism (AFE)
Seizures
Haemorrhage
Rupture of ectopic pregnancy
Subarachnoid haemorrhage
Cerebral haemorrhage
Carvenous venous thrombosis (CVT)
Metabolic causes
Investigation could include one or more of these:
ECG
ABG
V/Q scan or CTPA
Bloods which includes FBC, coagulation profile, fibrinogen, FDP
Thrombophilia screen
Pelvic ultrasound scan
CT/MRI/MRA
Venous angiography
Chest X-ray

Table 3: Differential diagnosis of chest pain in pregnancy.

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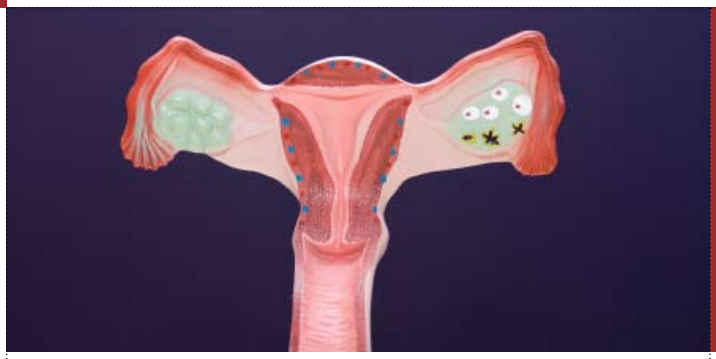
CASE BASED DISCUSSION: POLYCYSTIC OVARIAN SYNDROME

Mandeep Kaler, Amita Mahendru and Mr Khaled



Polycystic ovarian syndrome (PCOS) is a common disorder, often complicated by anovulatory infertility and hyperandrogenism, with the clinical manifestation of oligomenorrhoea, hirsutism and acne. Good Clinical Care.

Polycystic ovarian syndrome (PCOS) is a common disorder, often complicated by anovulatory infertility and hyperandrogenism, with the clinical manifestation of oligomenorrhoea, hirsutism and acne. Most clinical data suggests a prevalence of 6–7% of the population, with the highest incidence among South Asian women in the UK. Many women with this condition are obese and there is a higher incidence of impaired glucose tolerance, type 2 diabetes and sleep apnoea, than is observed in the general population[1]. These cases can present for the first time to gynaecology, endocrinology, reproductive medicine, dermatology, diabetes, general practice, cardiovascular medicine and metabolic medicine.

Diagnosis of PCOS

The Rotterdam ESHRE (European Society for Human Reproduction and Embryology) /ASRM (American Society of Reproductive Medicine) Consensus group diagnostic criteria state the presence of two out of three of the following criteria is diagnostic of PCOS[2, 3]:

- polycystic ovaries – either 12 or more peripheral follicles or increased ovarian volume (greater than 10cm)
- oligomenorrhoea and/or amenorrhoea or anovulation
- clinical features (hirsutism, acne) and/or biochemical signs of hyperandrogenism.

Symptoms of PCOS

- features of hyperandrogenism (acne, hirsutism, alopecia)
- menstrual disturbance – oligomenorrhoea or amenorrhoea
- infertility
- obesity

Signs of PCOS: general examination

1. Obesity
2. Hirsutism: this is excessive growth of coarse hair following a male-like pattern in a woman, and is a sign of hyperandrogenism. Its severity is assessed by using the modified Ferriman-Gallwey score. Hair growth is rated from 0 (no growth) to 4 (complete and heavy cover) in nine locations, (upper lip, chin, chest, upper back, lower back, upper abdomen, lower abdomen, the upper arms and the thighs), giving a maximum score of 36. A score of 8 and above in the white races is indicative of androgen excess[1].

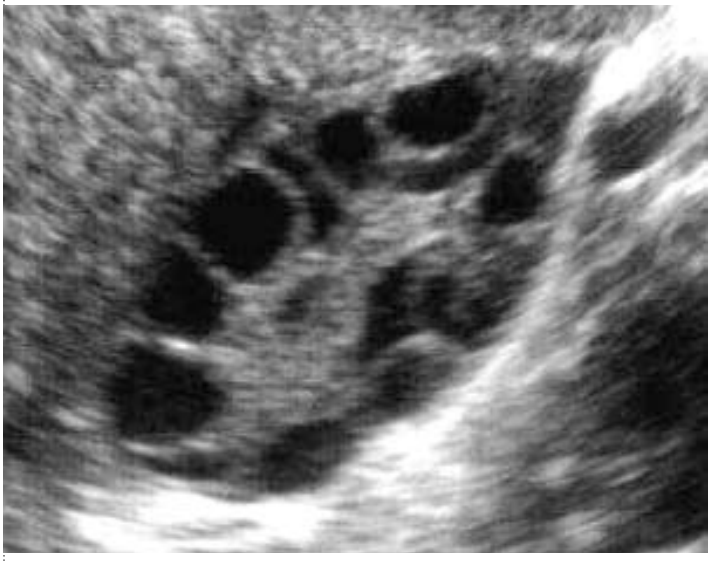
Investigations to help in the differential diagnosis

1. Serum endocrinology:

Investigations	Results
Androgens	Raised testosterone, androstenedione
FSH, LH, Oestradiol	High LH, usually normal FSH, raised oestradiol and oestrone
Prolactin	Raised
Thyroid function tests (TFTs)	Hypothyroidism
Sex hormone binding globulin (SHBG)	Reduced. SHBG normally binds with testosterone and therefore reduced levels result in an elevated-free androgen index
Glucose tolerance test (GTT) and lipid profile	Impaired glucose tolerance

Table 1: Recommended investigations used in the diagnosis of PCOS.

2. Pelvic ultrasound scan:



12 or more follicles measuring 2–9mm and/or increased ovarian volume (>10cm^3) illustrated below[1, 4, 5].

CASE BASED DISCUSSION: POLYCYSTIC OVARIAN SYNDROME

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Differential diagnosis

Exclusion of other causes of menstrual disturbance or hyperandrogenism is required before a diagnosis of PCOS can be made.

1. Oligomenorrhoea/amenorrhoea

Cause	Investigation/result
Ovarian failure/ premature menopause	Raised FSH and LH
Hyperprolactinaemia	Reduced FSH and LH
Hypothalamic	Reduced FSH and LH
Thyroid dysfunction	Abnormal TFTs

Table 2: Differential diagnosis for oligomenorrhoea and amenorrhoea.

2. Other causes of androgen excess; usually characterised by an isolated rise of androgens without any signs or symptoms of PCOS and may have classical features of related conditions such as:

- late onset congenital adrenal hyperplasia
- androgen secreting tumours
- Cushing syndrome.

Potential long-term consequences of PCOS

1. Diabetes mellitus

- Many studies have provided evidence for the association of insulin resistance in PCOS to the later development of impaired glucose tolerance and type 2 diabetes. Therefore, women diagnosed with PCOS should be offered an oral glucose tolerance test especially if they are obese (BMI greater than 30), older than 40 years of age or have a strong family history of type 2 diabetes.

2. Obstructive sleep apnoea

- This is common in PCOS. Symptoms such as snoring and daytime somnolence should be sought, and if appropriate, further investigation and treatment are offered.

3. Hypertension and cardiovascular disease

- Women presenting with PCOS should be assessed for cardiovascular risk factors. A validated tool has not yet been designed for calculating cardiovascular risk in women with PCOS. However, these women have been shown to have an increased risk of developing coronary artery disease due to factors such as obesity, hyperlipidaemia and hyperinsulinaemia. It is recommended to initiate treatment for hypertension in accordance with the Joint British Society Guidelines, although routine lipid-lowering treatment is not advocated.

4. Problems in pregnancy

- Women with PCOS are at a higher risk of developing gestational diabetes. These women should be screened for gestational diabetes prior to 20 weeks of gestation. If an abnormality is noted, appropriate referrals should be made to specialists during the antenatal period. Currently there is insufficient evidence supporting the safety of metformin use during pregnancy and as a result it is not licensed for use in pregnancy in the UK.

5. Increased risk of endometrial carcinoma

- Oligomenorrhoea or amenorrhoea in women with PCOS is associated with the development of endometrial hyperplasia with the potential for progression to endometrial adenocarcinoma (second most common female genital malignancy). Women are predisposed to endometrial hyperplasia if the interval between menstrual periods is greater than 3 months. Inducing regular withdrawal bleeds can prevent this. In addition a further investigation with ultrasound scan for endometrial thickness, endometrial sampling and hysteroscopy may be required[1, 5, 6].

Management

The objectives of treatment are to prevent the long-term consequences of PCOS and effective management of symptoms. With a diagnosis of PCOS, women should be informed about the potential long-term health risks associated with this disorder.

1. Obesity

- The first line of treatment should be lifestyle modification, with the introduction of a balanced diet and a regular exercise regimen. Significant reduction in weight has been shown to improve fertility, normalise glucose metabolism and reduce the risk of developing type 2 diabetes. Other available treatments include drug treatment with orlistat and sibutramine[1, 5, 6].

2. Role of metformin

- Insulin resistance is thought to be a cause of infertility in women with PCOS. Metformin is thought to act by suppressing hepatic gluconeogenesis, therefore reducing insulin resistance, and at the same time has been shown to reduce serum LH and testosterone. Serum renal and hepatic function must be checked prior to prescribing metformin, due to the rare risk of lactic acidosis. These blood tests should be repeated annually.
- Benefits: it is effective in ovulation induction, not associated with an increased risk of multiple pregnancies, treats the pathology of PCOS, improves the features of metabolic syndrome, is effective in both obese and lean women and appears to be effective in the treatment of hirsutism.
- Disadvantages: the effect of metformin is short term compared to lifestyle changes, there can be significant gastrointestinal side effects and lactic acidosis can occur.
- Current role: it is given in cases of infertility. The dose prescribed is 500mg three times a day, with a gradual increase in the dose to reduce the gastrointestinal adverse effects[1, 5, 6, 7].

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3. Management of menstrual irregularities

- Low dose combined contraceptive pill: it will induce an artificial cycle with regular shedding of the endometrium.
- Cyclical progesterone: used every 1 to 3 months, for 12 days to induce a withdrawal bleed. Both of these treatments prevent endometrial hyperplasia[1, 5, 6].

4. Hirsutism and acne

- Cosmetic therapies include, bleaching, waxing and electrolysis, which act as temporary measures while waiting for the effects of medical treatment to work. Laser treatment can also be employed; the effects last longer, however, with greater expense. Regular hair removal will be required. Women may complain of scarring and incomplete hair removal.
- Medical options aim to prevent further progression of hirsutism and reduce the rate of hair growth. A preparation of co-cyprindiol (Dianette) containing ethinylestradiol and cyproterone acetate is an antiandrogen used as first line management of hirsutism. The effects of this treatment are usually noticed within 2–3 months. During treatment liver function should be initially checked at 6 months and annually thereafter. Once symptom control has been achieved an alternative oral combined contraceptive pill (OCP) is prescribed due to the increased risk of thromboembolism with Dianette. In those women where the OCP is contraindicated the diuretic spironolactone (50mg twice daily) with antiandrogenic properties is prescribed.
- Eflornithine (Vaniqa) topical preparation has shown improvements in facial hirsutism. In practice a combination of different methods is employed to achieve adequate results[1, 5].

5. Infertility

- To improve both spontaneous and drug induced ovulation, weight loss should be encouraged.
- Ovulation induction: anti-oestrogen clomiphene citrate (50–100mg) taken on days 2–6 of a menstrual bleed induces ovulation in about 80% of these women, with 40% of them becoming pregnant. Monitoring is required either with serum progesterone or with ultrasound scans as there is a 10% risk of multiple pregnancies.
- Gonadotrophins: useful in cases of anovulatory infertility resistant to anti-oestrogens. Low dose gonadothrophins are given to prevent over stimulation of the ovaries and therefore reduce the risk of multiple pregnancies.
- Metformin, mentioned above, is prescribed to attempt to restore ovulatory cycles. Studies have demonstrated the benefit of using metformin and clomiphene citrate in combination to improve ovulation.
- Surgery: laparoscopic ovarian electrocautery has replaced ovarian wedge resection, as it was associated with extensive post-operative adhesion formation. A recent long-term cohort study on ovarian electrocautery has reported ovulation, serum androgen and SHBG levels returning to normal in 60% of subjects. It is important to mention that the future reproductive abilities of the ovaries may be affected with ovarian surgery. It has risks associated with laparoscopy and due to lack of consensus as to how many times and how deep the ovary should be drilled, it is currently only used in cases of anovulatory infertility resistant to clomiphene citrate treatment[1, 5, 7, 8].

Clinical scenario

- A 25-year-old Caucasian female presented to the gynaecology outpatient department, complaining of excess hair growth, weight gain and irregular menstrual periods. She did not have any significant past medical or surgical history. On clinical examination, positive findings included a BMI of 32 and hirsutism with heavy cover over the chin, upper lip and upper abdomen (Ferriman-Gallwey score of 12).
- Investigations arranged demonstrated raised LH: FSH ratio raised serum testosterone and reduced SHBG levels. GTT levels were within the normal range. USS results demonstrated 14 follicles measuring 6–8mm. A diagnosis of PCOS was made and explained to the patient.

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Conclusion

A management plan was instigated to treat the patient. General advice was given with regards to weight loss and a dietician referral was made to assist with weight loss. All other routine blood tests were normal. The patient did not have any concerns with regards to fertility, therefore, Dianette was prescribed to ensure a regular menstrual cycle, and at the same time improve hirsutism. She was also prescribed Vaniqa cream to help with facial hirsutism.

A follow-up appointment was arranged for 6 months time to review the patient and see whether the management plan was appropriate. The patient was informed about the long-term consequences of PCOS and the need to monitor blood glucose levels. To conclude an information leaflet was given providing further facts about PCOS.

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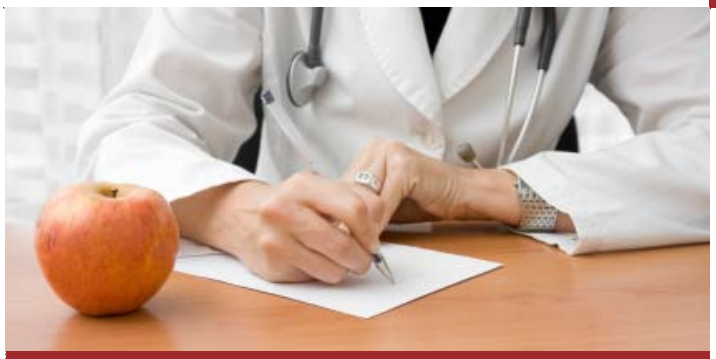

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Good Clinical Care.

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GYNAECOLOGICAL EMERGENCES

Sadia Ijaz, Fadi Alfhaily, J Evans Jones and MA Khaled

29-year-old primigravida presented to A&E with heavy vaginal bleeding and crampy lower abdominal pains at 8-weeks of pregnancy. Good Clinical Care.

Learning objectives

- Recognition of symptoms and signs of common gynaecological emergencies.
- Carry out appropriate examination and investigations.
- Identify patients who need urgent surgical intervention.

Introduction

Evaluation of a female patient presenting with an acute abdomen must always include comprehensive history and examination. Failure to diagnose and manage any gynaecological emergency at the appropriate time may lead to serious and chronic consequences. Table 1 shows the various causes of acute abdomen. The usual symptoms include sudden onset of lower abdominal or pelvic pain, pyrexia, vaginal bleeding, intra-abdominal bleeding, and/or symptoms of shock. Because pelvic pain has a number of causes, finding the source can be a long and complex process. Even when no specific cause can be found, there are treatments that can help. The findings on initial clinical evaluation may help to differentiate among many potential causes and help plan further evaluation and management. In addition to the general physical and systemic examination it is essential to perform a speculum examination to visualise the cervix and take high vaginal, endocervical and chlamydia swabs. Bimanual examination helps to determine the uterine size, position and mobility and also helps to exclude the presence of any adnexal masses and/or cervical excitation.

However, there is a significant inter-examiner reliability difference among doctors performing the pelvic examination.

Clinical scenario 1

29-year-old primigravida presented to A&E with heavy vaginal bleeding and crampy lower abdominal pains at 8-weeks of pregnancy. One week ago, she had a scan in the early pregnancy unit due to PV spotting and showed an intrauterine gestational sac with yolk sac but no foetal pole and was given a follow-up with repeat ultrasound in 2 weeks to confirm viability.

What is the likely diagnosis and management?

Incidence of miscarriage is quite high and almost one in four pregnancies end up in a miscarriage. This patient had a failing intrauterine pregnancy earlier which now presented as an inevitable miscarriage. In A&E she was resuscitated and given pain relief. Speculum examination revealed products of conception protruding through the cervical os and was removed, bleeding was observed and the patient was later discharged home with a diagnosis of complete miscarriage with a follow-up in EPAU if bleeding persisted.

Miscarriage

Miscarriage is defined as pregnancy loss before 24 completed weeks of pregnancy. It is the most common complication of early pregnancy requiring hospital assessment and/or admission as it occurs in 10–20% of pregnancies and accounts for 50,000 admissions to UK hospitals annually.

The usual symptoms include pain and heavy vaginal bleeding and the differential diagnosis include:

- threatened miscarriage
- inevitable miscarriage
- incomplete miscarriage
- complete miscarriage
- delayed or missed miscarriage
- septic miscarriage.

The concept of a dedicated outpatient early pregnancy assessment unit (EPAU) is now standard practice and involves the use of a multidisciplinary team to confirm the diagnosis and arrange the appropriate management plan. These units should have access to transvaginal ultrasound (TVS), as ultrasound assessment is particularly reliable in confirming the diagnosis of complete miscarriage with a positive predictive value of 98%.

EPAUs should develop and use diagnostic and therapeutic algorithm guidelines and protocols to manage women with early pregnancy complications, in particular those with a suspected ectopic pregnancy or an intrauterine pregnancy of uncertain viability.

Patients with a previous history of ectopic pregnancy or recurrent miscarriage should have the ability to "self-refer" at 6-weeks gestation to EPAUs. However, there should be set criteria for referral as 5–10% of referral is found to be inappropriate, including 2–5% who were not pregnant.

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Pelvic examination is not mandatory for all patients as anxiety levels are high in all patients attending with bleeding in early pregnancy and there is no scientific evidence to support detailed infective screening in sporadic miscarriage. However, pelvic examination should be offered in cases of:

- heavy bleeding
- significant pain
- possibility of products in the cervical os
- evidence of sepsis
- suspected ectopic pregnancy
- recurrent bleeding, to exclude local causes.

Threatened miscarriage may be the initial diagnosis clinically and until ultrasound confirmation of viability or non-viability, the finding of a closed cervical os should indicate potential viability and should be managed conservatively.

On TVS, the presence of an intrauterine gestational sac (IUGS) <20mm mean diameter with no obvious yolk sac or foetal echo <6mm CRL with no obvious foetal heart activity indicates a pregnancy of "uncertain viability". Therefore, in order to confirm or refute viability, a repeat scan at a minimal interval of 1 week should be done. Even in specialised scanning units, the overall incidence of pregnancy of unknown location is 8–10% of women at their first EPAU visit.

When ultrasound assessment of the uterine cavity shows heterogenous shadows with a maximum AP diameter of 15mm or less, genuine retained products are less likely to be confirmed histologically.

Incomplete miscarriage may present with severe bleeding and signs of shock which is usually due to excessive vaginal stimulation rather than haemorrhage. Clinical management of a collapsed patient include:

- call for help
- check ABCs of basic resuscitation
- IV access with two large cannulae
- send blood for FBC, clotting profile, group and save or cross and match 4 units
- speculum examination to remove blood clots from the vagina and products from the os. Cases of "cervical shock" will respond rapidly to removal of tissue distending the cervical canal
- administer ergometrine 500micrograms IV/IM
- consider the need to arrange urgent surgical evacuation.

In cases of pregnancy of unknown location (no signs of either intra or extrauterine pregnancy, or retained products of conception in a woman with a positive pregnancy test), a serum progesterone, serial serum ß hCG and TVS may be required to establish a definite diagnosis and exclusion of ectopic pregnancies.

Stable patients with incomplete or missed miscarriage should be offered conservative, surgical or medical treatments and managed according to their wishes.

The clinical indications for offering surgical evacuation include: persistent excessive bleeding, haemodynamic instability, evidence of infected retained tissue and suspected gestational trophoblastic disease. However, medical methods are an effective alternative in the management of confirmed first trimester miscarriage and expectant management is another effective method to use in selected cases of confirmed first trimester miscarriage.

The tissue obtained at the time of miscarriage should be examined histologically to confirm pregnancy and to exclude ectopic pregnancy or unsuspected gestational trophoblastic disease.

Non-sensitised rhesus (Rh) negative women should receive anti-D immunoglobulin in the following situations: ectopic pregnancy, all miscarriages over 12-weeks gestation (including threatened) and all miscarriages where the uterus is evacuated medically or surgically and anti-D immunoglobulin should only be given for threatened miscarriage under 12-weeks gestation when bleeding is heavy or associated with pain; whereas, it is not required for cases of complete miscarriage under 12-weeks gestation when there has been no formal intervention to evacuate the uterus.

Finally, evidence suggests that appropriate support and counselling offered to women after miscarriage can have significant beneficial effects.

Clinical scenario 2

A 32-year-old woman presented with severe right iliac fossa pain and PV spotting. She is using the oral contraceptive pill but said she had a very light period 2 weeks ago which was unusual for her, pregnancy test done in A&E was found to be positive. On examination she was tachycardiac and had rebound tenderness and needed morphine for analgesia; bimanual examination revealed marked cervical excitation with right adnexal tenderness.

What is the most likely diagnosis?

An urgent pelvic scan revealed a right-sided tubo-ovarian mass indicative of right-sided ectopic pregnancy, therefore she had an urgent laparoscopic right salpingectomy done for ruptured right-sided ectopic pregnancy. Ectopic pregnancy can present itself with so many atypical presentations that clinicians should always exclude it in a female with acute abdomen in the reproductive age group.

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Ectopic pregnancy

Ectopic pregnancy is a potential cause of maternal mortality, being a direct cause of 10 maternal deaths in the 7th report of "The Confidential Enquiry into Maternal and Child Health (CEMACH) in the United Kingdom: Saving Mothers' Lives, 2003–2005". Despite modern advances, the diagnosis of ectopic pregnancy can still be difficult and challenging.

A careful history should be directed to assess the risk factors and symptoms of ectopic pregnancy which may include: lower abdominal pain, vaginal bleeding, dizziness, tip shoulder pain, rectal pain and/or collapse. Physical examination should look for evidence of abdominal or pelvic tenderness, pelvic mass and cervical excitation.

Assessment and diagnosis depend on one or more of the following:

- clinical knowledge and skills with a high index of suspicion of diagnosis
- TVS findings
- serial quantitative serum ßhCG
- laparoscopy.

On the initial assessment the first priority is to determine the haemodynamic status of the patient. Tachycardia, hypotension and altered conscious level suggest cardiovascular compromise and should be managed expediently.

TVS is the single most useful diagnostic tool. An IUGS has 99% specificity for exclusion of ectopic pregnancy and a complex adnexal mass or adnexal foetal pole/heart beat is specific for ectopic pregnancy in 99% and 100% respectively, but will only be seen in 56% and 10% of cases.

The greatest value of quantitative serum ßhCG is in the assessment of patients with unknown location of pregnancy.

In a healthy intrauterine pregnancy, serum levels of ßhCG double approximately every 48 hours. The lower limit of the reference range to which serum ßhCG should increase during a 2-day period is 66%. However, 15% of healthy intrauterine pregnancies do not increase by 66% and 13% of all ectopic pregnancies have normally rising ßhCG levels of at least 66% in 2 days; moreover, 64% of ectopic pregnancies initially may have normal doubling ßhCG levels.

A negative pregnancy test normally excludes a "clinically significant" ectopic pregnancy; however, a negative urine and serum ßhCG tests have been reported among 3.1% and 2.6% of ectopic pregnancies respectively. Also, it has been reported that 8% of patients with negative (false negative) urinary pregnancy test required surgery subsequently.

Laparoscopy is the gold standard diagnostic tool, but can miss early ectopic pregnancies. Figure 1 demonstrates the algorithm in the management of a patient with a suspected ectopic pregnancy.

Management of ectopic pregnancy can be expectant, medical or surgical by laparoscopic approach or laparotomy. A laparoscopic approach to the surgical management of tubal pregnancy, in the haemodynamically stable patient, is preferable to an open approach. However, management of ectopic pregnancy in haemodynamic unstable patient should be by the most expedient method and in most cases this will be laparotomy.

Medical therapy can be offered to stable women, and EPAUs units should have clear protocols for the use of methotrexate in the treatment of ectopic pregnancy. If medical therapy is offered, women should be given clear written information about the possible need for further treatment and adverse effects following treatment. Women should be able to return easily for assessment at any time during follow-up. Women most suitable for methotrexate therapy are those with a serum ßhCG less than 3000IU/L with minimal symptoms.

Expectant management is, also, an option for clinically stable women with minimal symptoms and a pregnancy of unknown location or for clinically stable asymptomatic women with an ultrasound diagnosis of ectopic pregnancy and a decreasing serum ßhCG, initially less than 1000IU/L.

Pelvic inflammatory disease

Clinical scenario 3

A 22-year-old woman presented with a history of feeling unwell, lower abdominal pain and offensive vaginal discharge for a few days. On examination her temperature is 38 degrees Celsius. She has generalised tenderness across the lower abdomen. Her full blood count result reveals high white cell count and raised C reactive protein. On bimanual examination she has cervical excitation.

What is the most likely diagnosis?

This patient is likely to have acute pelvic inflammatory disease (PID). Acute PID needs urgent treatment with intravenous or oral antibiotics and needs appropriate follow-up in genitourinary medicine clinic with appropriate contact tracing if needed. PID can cause hydrosalpinx and pelvic abscesses which need surgical interventions.

PID is usually the result of ascending infection from the endocervix causing endometritis, salpingitis, parametritis, oophoritis, tubo-ovarian abscess and/or pelvic peritonitis. The commonly identified organisms include chlamydia trachomatis, neisseria gonorrhoea and mycoplasma hominis and other anaerobes. In 20–25% of cases, there are no specific causal organisms. It is important to make the diagnosis as early as possible to avoid serious complications such as chronic pelvic pain, infertility, adhesions and ectopic pregnancy. Patients with PID may present with a wide range of symptoms and signs.

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The following clinical features are suggestive of a diagnosis of PID:

- bilateral lower abdominal tenderness (sometimes radiating to the legs)
- abnormal vaginal or cervical discharge
- fever (>38°C)
- abnormal vaginal bleeding (intermenstrual, post-coital or "breakthrough")
- deep dyspareunia
- cervical motion tenderness on bimanual vaginal examination
- adnexal tenderness on bimanual vaginal examination (with or without a palpable mass).

The positive predictive value of the clinical diagnosis of PID is 65–90% compared with laparoscopic diagnosis but laparoscopy may also lack sensitivity as 15–30% of suspected cases may have no laparoscopic evidence of acute infection, despite organisms being identified from the fallopian tubes.

TVS may reveal inflamed and dilated tubes or tubo-ovarian masses but laparoscopy remains the gold standard for diagnosis.

The differential diagnosis of PID includes: ectopic pregnancy, acute appendicitis, endometriosis, irritable bowel syndrome, complications of an ovarian cyst (such as rupture or torsion), urinary tract infection and functional pain.

Outpatient antibiotic treatment is appropriate for patients with mild or moderate PID (in the absence of a tubo-ovarian abscess) and should involve one of the following regimens:

- Oral ofloxacin 400mg twice daily plus oral metronidazole 400mg twice daily for 14 days.
- Intramuscular ceftriaxone 250mg single dose followed by oral doxycycline 100mg twice daily plus metronidazole 400mg twice daily for 14 days.

Admission to hospital should be considered in the following circumstances:

- to exclude surgical emergency
- clinically severe disease
- tubo-ovarian abscess
- PID in pregnancy
- lack of response to oral therapy
- intolerance to oral therapy.

Inpatient antibiotic treatment should be based on intravenous therapy for 24 hours after clinical improvement followed by oral therapy.

Recommended regimens are:

1. Ceftriaxone 2g by intravenous infusion daily plus intravenous doxycycline 100mg twice daily followed by oral doxycycline 100mg twice daily plus oral metronidazole 400mg twice daily for a total of 14 days:
   - Oral doxycycline may be used if tolerated.

2. Intravenous clindamycin 900mg three times daily plus intravenous gentamicin followed by either oral clindamycin 450mg four times daily to complete 14 days or oral doxycycline 100mg twice daily plus oral metronidazole 400mg twice daily to complete 14 days:
   - Gentamicin should be given as a 2mg/kg loading dose followed by 1.5mg/kg three times daily or a single daily dose of 7mg/kg.

3. Intravenous ofloxacin 400mg twice daily plus intravenous metronidazole 500mg three times daily for 14 days.

Ovarian pathology

Clinical scenario 4

A 47-year-old lady presented with sudden onset of sharp severe left iliac fossa pain. She had noted recently an increase in her abdominal girth and had been experiencing frequency of micturition. She says she had never experienced such severe pain before. On examination there is a large tender pelvic mass about 10cm above the pubic symphysis.

What is the likely diagnosis and management?

This patient had an urgent ultrasound, which showed a large left ovarian cyst about 16cm x 12cm. She underwent an emergency laparotomy and was diagnosed as having torsion of the ovarian cyst and had left oophrectomy done. Histology results later revealed that it was a benign dermoid cyst. Ovarian cysts can be asymptomatic for many years and can present as an emergency with torsion or bleeding.

Ovarian cysts are a common ovarian pathology as they are the fourth most gynaecological cause of hospital admission. However, accidents to ovarian cysts are not that common. They can be asymptomatic but may cause a sudden onset of severe lower abdominal pain, dyspareunia and may present with peritonitis in the case of rupture, torsion, infection or hemorrhage. The diagnosis is usually made on the basis of the history, examination and investigations, such as pelvic ultrasound. Sometimes a CT scan is needed to further investigate the type of cyst and to exclude malignancy. Tumor markers, such as CA 125, are used to calculate the risk of malignancy index (RMI) and plan further management.

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Features of torted ovarian cyst include: acute or subacute pelvic pain, abdominal tenderness with guarding and rigidity, nausea and vomiting, and fever and leukocytosis. However, almost half of suspected ovarian torsions are caused by other conditions. Haemorrhage can occur from the torn edge of a ruptured cyst or it may bleed into the cavity of the cyst. Two-thirds of cases of ovarian cyst torsion or rupture occur on the right side. Intra-abdominal bleeding from a ruptured corpus luteum cyst can mimic ruptured ectopic pregnancy. Occasionally, ovarian cysts may present with deep vein thrombosis, acute urinary retention or intestinal obstruction. Moreover, infection of an ovarian cyst may complicate the clinical picture. Almost 1% of dermoid cysts become infected, usually by coliforms. More than 20% of haemorrhagic ovarian cysts can be managed conservatively and even complete torsion of an ovarian cyst can be managed successfully by a laparoscopy approach.

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Pregnancy related	Gynaecologic causes	Other causes
• Miscarriage: - Threatened - Incomplete - Inevitable - Missed - Septic • Ectopic pregnancy • GTD • Rupture corpus luteum cyst	• Ovarian cyst accident (hemorrhage/ rupture/torsion /infection) • Acute pelvic inflammatory disease • Endometriosis • Uterine fibroids /degeneration • Primary or secondary dysmenorrhea • Pelvic neoplasm	• Acute appendicitis • Inflammatory bowel disease • Diverticulitis • Mesenteric adenitis • Urinary tract infection • Pyelonephritis • Nephrolithiasis /renal or ureteric colic • Basal pneumonia • Sexual abuse • Trauma • Bowel: perforation /obstruction • Hernia-related • Musculoskeletal

Table 1: Various causes of acute abdomen.

Laboratory
1. Complete blood count, G&S, U&E, LFT and CRP
2. Urinalysis and MSU
3. HVS and cervical swab for gonorrhea and chlamydia
4. Urine pregnancy test
Sometimes, depending on the symptoms and the results of the lab tests, you may need imaging studies or other procedures
Imaging
1. Transvaginal/ transabdominal pelvic ultrasound scan
2. Consider other imaging in a non-pregnant patient: • Plain flat and upright abdomen • CT/MRI pelvis, IVP, cystoscopy
Laparoscopy

Table 2: Investigations used in the diagnosis of pelvic pain cause.

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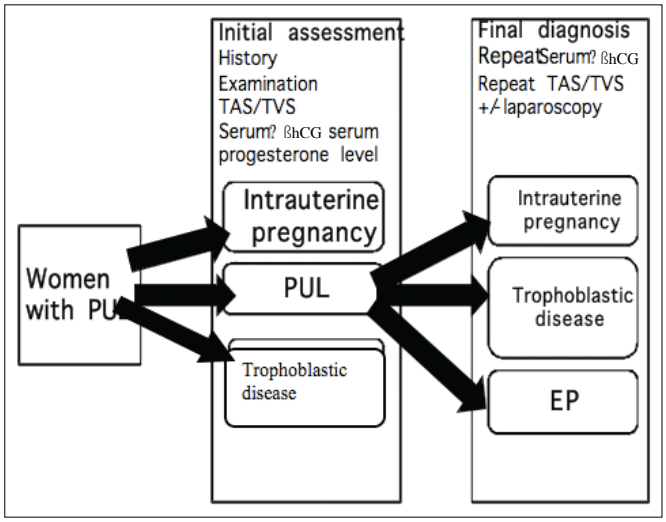

Figure 1: The diagnostic algorithm for the management of patient with suspected ectopic pregnancy.

EP: ectopic pregnancy
PUL: pregnancy of unknown location
TAS/TVS: transabdominal/ transvaginal scan

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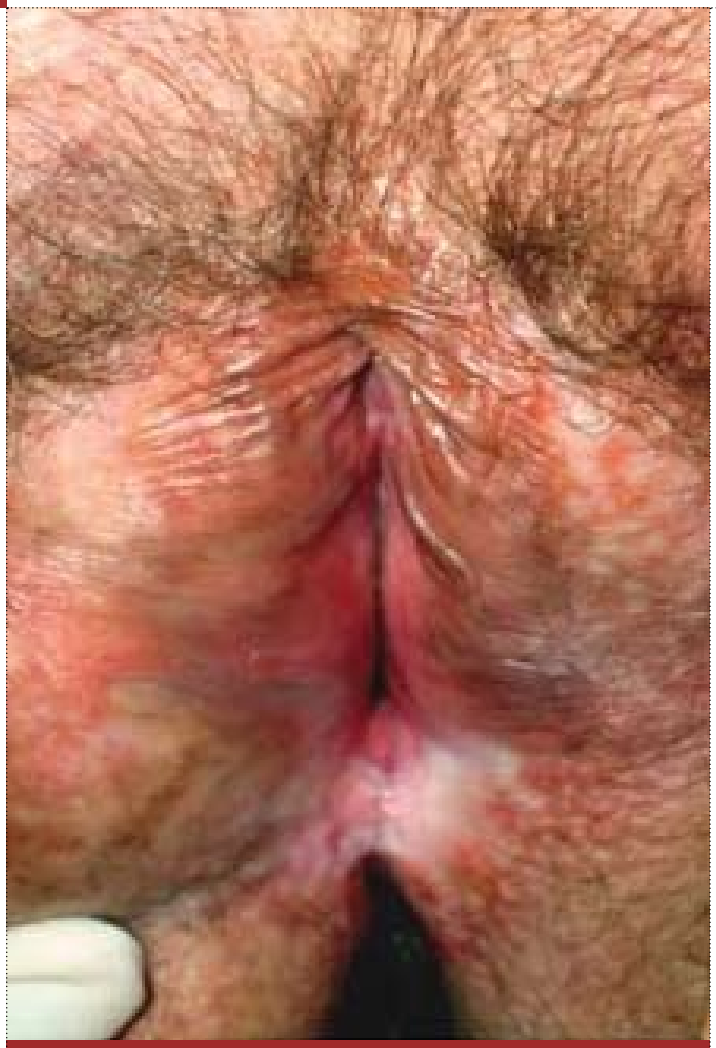
BENIGN CONDITIONS OF THE VULVA

J Putran and MA Khaled



A 56-year-old woman presents with soreness and a burning sensation over the vulva for 6 months. She was given antifungal treatment without relief of symptoms.
Good Clinical Care.

Case histories

Case history 1
A 56-year-old woman presents with soreness and a burning sensation over the vulva for 6 months. She was given antifungal treatment without relief of symptoms. On examination of the vulva, the skin looked pale, fissured and thin.

What is the likely diagnosis?
The most probable diagnosis is that of lichen sclerosus.

How would you treat her?
Treatment of lichen sclerosus is with the local application of a topical steroid ointment. She needs a yearly follow-up as there is a small chance of malignancy.

Case history 2
A 23-year-old woman attends the walk-in centre with pain over the vulva and acute retention of urine. On examination, there are several small ulcers on the vulva.

What is the likely diagnosis?
The most likely diagnosis is that of herpes simplex.

How will you treat her?
She needs to be referred immediately to genitourinary medicine (GUM) clinic for acyclovir therapy. She may need catheterisation for acute retention of urine.

Introduction

The vulva consists of the labia majora, the labia minora, the mons pubis, clitoris, perineum and the vestibule. Embryologically, it is formed from the urogenital ectoderm, cloacal endoderm and paramesonephric mesodermal layers. Patients with vulval symptoms are common in gynaecological practice. Common conditions include lichen sclerosus, lichen simplex and vulval infections. Developmental abnormalities of the vulva are rare.

Table 1	
Lichen sclerosus	243
Lichen simplex/eczema	56
Lichen planus	23
Vulval vestibulitis syndrome	98
Dysaesthetic vulvodynia	32
Vulval intraepithelial neoplasia	82
Paget's disease	4
Malignant melanoma	2
Psoriasis	25
Diabetic vulvitis	9
Vulval carcinoma	23

Table 1: Incidence of vulval lesion in 1,000 women (MacLean et al. 1998).

BENIGN CONDITIONS OF THE VULVA

J Putran and MA Khaled

Presentation of vulval disease

The most common presenting complaint is that of pruritus. Other symptoms include pain, burning, soreness and stinging. Symptoms may be associated with a lesion.

Classification of vulval disease

The International Society for the Study of Vulvovaginal Disease (ISSVD) has classified non-neoplastic disorders of the vulva (see Table 2). Some of the older terminology has been replaced.

Table 2	
Infections	Parasitic, protozoal, viral, bacterial, fungal, others
Inflammatory skin disease	
Spongiotic disorders	Contact dermatitis, atopic dermatitis, others
Acanthotic pattern	Psoriasis, lichen simplex chronicus
Lichenoid pattern	Lichen sclerosus, lichen planus, fixed drug eruption
Vesicobullous pattern	Pemphigoid, pemphigus, erythema multiforme, Stevens-Johnson syndrome
Granulomatous pattern	Crohn's disease
Vasculopathic pattern	Aphthous ulcers, Behçet disease, plasma cell vulvitis
Skin appendage disorder	Hidradenitis suppurativa
Hormonal disorder	Precocious puberty, oestrogen deficiency
Functional disorders	Pain, pruritus, sexual disorders
Ulcers and erosions	
Pigmentation disorders	Lentigo, vitiligo

Table 2: Revised ISSVD (2006) classification of Vulval disease or non-neoplastic epithelial disorders.

Examination of the vulva

General examination of the woman with vulval symptoms includes inspection of the buccal mucosa. Examination of skin, especially scalp, finger nails, hands, elbows and knees may point to a generalised problem.

Inspection of the vulva should include the perineal and perianal region. Colposcopy of the vulva is of value if the woman has symptoms but no obvious lesion on inspection. Punch biopsy of the vulval skin can be performed as an outpatient procedure.

Management

Management primarily depends on the diagnosis. But as general advice, women are advised to avoid contact with soap, shampoo and bubble bath; emollients can be used as a soap substitute. Women are also advised to avoid tight fitting garments and spermicidally lubricated condoms.

Lichen sclerosus

This is an inflammatory condition of the vulva of unknown aetiology. It is one of the most common conditions seen in a vulval clinic. All age groups can be affected by this disorder. Symptoms include irritation, soreness, dysparunia and urinary symptoms. On examination, the vulval skin looks thin, pale and atrophic with fissuring and erosions. The risk of developing squamous cell carcinoma is small. Diagnosis is usually clinical but may be confirmed by vulval biopsy. Treatment consists of local application of a potent steroid ointment.

Lichen planus

This is a skin condition that affects any keratinised skin, genital and oral mucosa. In the vulvar area, the disease may occur in three forms: papulosquamous, erosive or hypertrophic. Vaginal involvement is more common in lichen planus than lichen sclerosus. Management is similar to lichen sclerosus.
Lichen simplex chronicus. This condition is the end stage of the "itch-scratch-itch" cycle. The initial stimulus to itch may be seborrhoeic dermatitis, intertrigo or psoriasis.

Intertrigo

This is a non-specific inflammation of skin folds usually precipitated by sweating and obesity.

Psoriasis

This is a hereditary skin condition characterised by silver–white scales on erythematous plaques.

Vulval ulceration

Ulcers on the vulva may be due to infection, dermatitis, Crohn's disease or pyoderma gangrenosum.

BENIGN CONDITIONS OF THE VULVA

J Putran and MA Khaled

Vulval infection

This includes candidiasis, condyloma acuminate, herpes simplex, syphilis, chancroid and staplylococcal infection (see Table 3). Management depends on the diagnosis. Sexually transmitted infections need referral to the Department of Sexual Health (DOSH) for treatment and partner notification.

Organism	Symptoms	Management
Candida albicans	Acute pruritus, white discharge, associated diabetes, pregnancy or antibiotic and COCP use	Topical antifungal or oral fluconazole
HPV usually type 6, 11	Typical lesions, may extend into vagina and cervix	Refer to DOSH, treat with topical podophyllin, other agents
Herpes simplex - usually type 2	Prodromal symptoms followed by appearance of blisters and ulcers	Refer to DOSH, oral or topical aciclovir
Bartholin abscess - bacterial	Painful vulval swelling	Antibiotics and surgical drainage
Syphilis - treponema pallidum	Painless ulcer, maculo popular rash	Refer to DOSH, penicillin
Trichomona vaginalis	Discharge, irritation and dysparunia	Oral metronidazole, treat partner
Pediculosis and scabies	Itching	Topical agents

Table 3: Infection of the vulva.

Benign tumors of the vulva

Lipomas and fibromas are common benign tumors of the vulva. Haemangiomas are common in childhood and usually disappear spontaneously. Bartholin gland cyst and Skene duct cyst develop as a result of ductal occlusion.

Congenital malformations

Ambiguous external genitalia may be due to female or male pseudohermaphroditism. Labial adhesions result from fusion of labia minora primarily in young children due to a lack of oestrogen.

Vulval pain

The ISSVD has developed a terminology for classification of vulvar pain (see Table 4).

Provoked vulvodynia (vulval vestibulitis)

This condition is characterised by pain felt at the introitus during sexual intercourse. Aetiology is unknown. On examination, there are no signs of acute inflammation. There is focal tenderness over the vestibule. Fifty per cent of cases resolve spontaneously.

Table 4	
Vulvar pain related to a specific disorder	1.Infections (e.g. candidiasis,herpes) 2.Inflammatory (e.g. lichen planus, immunobullous disorders) 3.Neoplastic (e.g. Paget's disease, squamous cell carcinoma) 4.Neurologic (e.g. herpes neuralgia, spinal nerve compression)
Vulvodynia	1.Generalised - provoked, unprovoked, mixed 2.Localised – provoked, unprovoked, mixed

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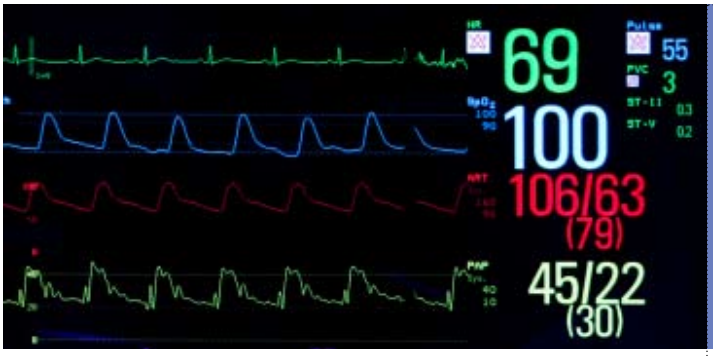
ANAESTHESIA AND ANALGESIA IN OBSTETRICS

Liam McLoughlin and Sofia Amiruddin



Anaesthetists deal with approximately half of all women giving birth. Image shows EKG, pulse oximetry, systemic blood pressure and pulmonary blood pressure displayed on patient's monitor.
Good Clinical Care.

Approximately 600,000 women give birth in England and Wales each year. Almost half of these (47%) give birth without intervention of any kind. Annually therefore, nearly one-third of a million women might require the services of an anaesthetist for delivery. According to the National Sentinel Caesarean Section Audit the overall Caesarean section rate for England and Wales was 21.5% . The remaining women will receive intrapartum regional analgesia or anaesthesia for post-partum complications such as manual removal of the placenta or post-partum haemorrhage.

The Obstetric Anaesthetists Association (OAA) in conjunction with The Association of Anaesthetists of Great Britain and Ireland (AAGBI) has set the standards for the practice of obstetric anaesthesia in Great Britain . The National Institute for Clinical Excellence (NICE) has also recently published guidelines on intrapartum anaesthetic management[1] in addition to previously published guidance on Caesarean section .

In the UK, maternal deaths have been subject to a long running audit published as a triennial report, the Confidential Enquiry into Maternal and Child Health (CEMACH) now published under the auspices of NICE, the most recent report covering the triennium 2003–2005 and published in December 2007 . These reports reveal that there has been a substantial decline in overall maternal death rates since the reports began in 1952 and a similar dramatic fall since the 1960s in direct deaths due to anaesthesia. The direct death rate due to anaesthesia has recently increased more than five fold (0.05 to 0.28 per 100,000 maternities) since 1994–1996 due to multiple factors, such as the rising prevalence of obesity, more high-risk pregnancies, medical mishaps and trainee inexperience due to changes in medical education[5].

The role of the anaesthetist in obstetrics

Anaesthetists deal with approximately half of all women giving birth. The role of the anaesthetist encompasses preoperative assessment including high-risk women with obesity or comorbidity such as congenital cardiac disease, diabetes mellitus, neurological and respiratory conditions and those who have had previous orthopaedic intervention such as scoliosis correction. The anaesthetist also provides anaesthesia and post-operative analgesia for Caesarean section and intrapartum regional analgesia and contributes to the multidisciplinary management of acute obstetric complications, such as haemorrhage and eclampsia, and is involved in the initiation of obstetric critical care.

Physiological changes of pregnancy

The normal physiological changes of pregnancy are relevant to the practice of obstetric anaesthesia. Plasma volume rises by 40% and is accommodated by profound nitric oxide mediated peripheral vasodilatation and a rise in cardiac output of 50% due to an increase in both heart rate and stroke volume. Compression of the aorta and inferior vena cava by the gravid uterus can compromise cardiac output and if severe can result in the aorto-caval syndrome with postural hypotension, bradycardia and syncope. Respiratory alterations include a rise in tidal volume with unaltered respiratory rate giving a rise in minute volume (50% at term) but as dead space is unaltered there is a 70% increase in alveolar ventilation with hyperventilation reducing maternal blood carbon dioxide tension thereby facilitating its transplacental transfer from the foetus. Maternal oxygen consumption is raised by 60% at term but airway resistance is reduced under the influence of progesterone. Functional Residual Capacity (FRC), the volume of gas in the lungs at the end of a normal tidal expiratory breath and which can act as a reserve of oxygen during apnoea is reduced by 20% in pregnancy with a further reduction of 20% in the supine position. Important changes to upper gastrointestinal function include reduced barrier pressure (intra-oesophageal pressure minus intra-gastric pressure) with a tendency to gastro-oesophageal reflux and impaired gastric emptying with the onset of labour and exacerbated by anticholinergic and opioid medication. The potency of anaesthetic volatile agents is increased in pregnancy (there is a reduction in MAC, the Minimum Alveolar Concentration required to cause surgical anaesthesia in 50% of subjects) due in part to an effect of progesterone on neural tissue .

Case based discussion 1 - regional analgesia for labour

A 29-year-old primigravida woman in established labour is requesting an epidural for analgesia. Discuss the following:

1. How does an epidural work?
2. What are the indications for regional analgesia?
3. What are the contraindications to an epidural?
4. What are the complications and side effects of epidurals?

ANAESTHESIA AND ANALGESIA IN OBSTETRICS

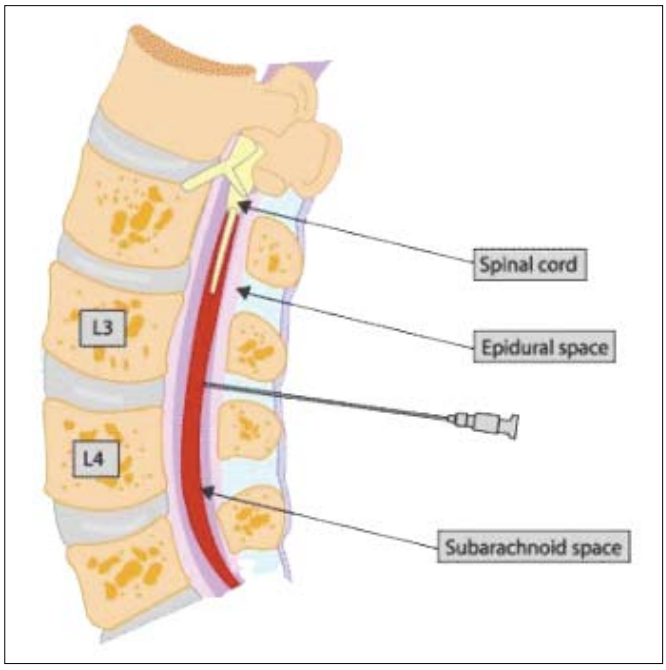
Liam McLoughlin and Sofia Amiruddin

Introduction

The take-up rates for epidural and combined spinal-epidural (CSE) analgesia during labour vary greatly according to geographical location, and range from about 20% to over 90% of parturients. Written consent for regional analgesia in labour is recommended but not required and the OAA has produced an epidural information leaflet for women in labour .

How epidurals work

Epidural analgesia consists of local anaesthetic with or without an opioid, injected into the epidural space to block the spinal nerves as they leave the vertebral column. This is usually achieved by aseptically introducing a 16 gauge catheter into this space.



Labour analgesia is often initiated by a bolus of, for example, 15ml of a solution of 0.1% bupivaciane and 2mcg/ml fentanyl followed by an infusion of this solution at 10ml/hour. Manual top-ups by midwife or anaesthetist are possible at any time to satisfy individual analgesic requirements. Bolus intermittent top-ups with the above background infusion is popular (Patient Controlled Epidural Analgesia, PCEA).

Alternatively, a small dose of intrathecal local anaesthetic and opioid (e.g. 1ml of 0.5% bupivacaine plus 25mcg fentanyl) may be introduced into the subarachnoid space to give rapid analgesia in some women followed by the placement of an epidural catheter in the usual way. This combined spinal-epidural formed the basis of the controversial so-called "mobile epidural" popular some 15 years ago. Epidural catheters may be used to provide anaesthesia for emergency Caesarean section in labour or for instrumental deliveries.

Indications for epidural analgesia

In addition to maternal request, regional blockade in labour is indicated for parturients at high risk of emergency Caesarean, section such as those with obesity, medical comorbidity, pre-eclampsia and multiple gestation.

Contraindications to epidurals

Absolute:

Patient refusal
Localised infection at the insertion site.

Relative:

Sepsis
Coagulopathy
Spina Bifida or other peripheral neurological disease.

Complications and side effects of epidurals

- Epidural venous puncture by the epidural catheter leading to complications of inadvertent intravenous local anaesthetic injection.
- Inadvertent dural puncture with the epidural needle leading to a leak of cerebrospinal fluid (CSF) causing a post dural puncture headache (PDPH) (approximately 1 in 100).
- Subarachnoid or subdural placement of the epidural catheter or migration of the catheter into the subarachnoid space leading to a "total spinal" (see below).
- Hypotension due to vasodilatation caused by the sympathetic block. This may be treated by infusion of colloid and a pressor agent, such as phenylephrine.
- Inadequate analgesia (block failure).
- Nerve damage by the epidural needle or catheter.
- Epidural abscess or haematoma formation.

Epidurals do not raise the emergency Caesarean section rate and do not cause long-term backache but do increase the need for assisted instrumental delivery

ANAESTHESIA AND ANALGESIA IN OBSTETRICS

Liam McLoughlin and Sofia Amiruddin

Case based discussion 2 - anaesthesia for a Caesarean section

A 34-year-old lady presents for an elective Caesarean section for breech presentation. Discuss the anaesthetic options available and what factors might influence your decision as to the choice of anaesthesia.

The choice of anaesthesia for this procedure falls into two categories:

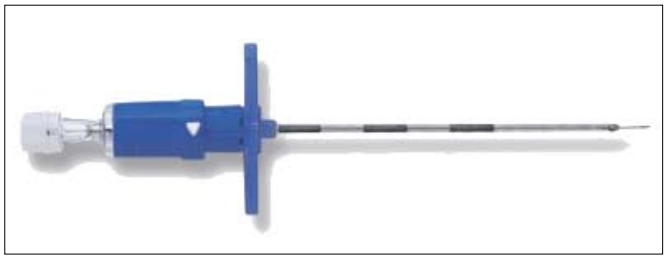
Regional anesthesia – spinal, epidural or combined spinal epidural

or

General anaesthesia

Regional anaesthesia

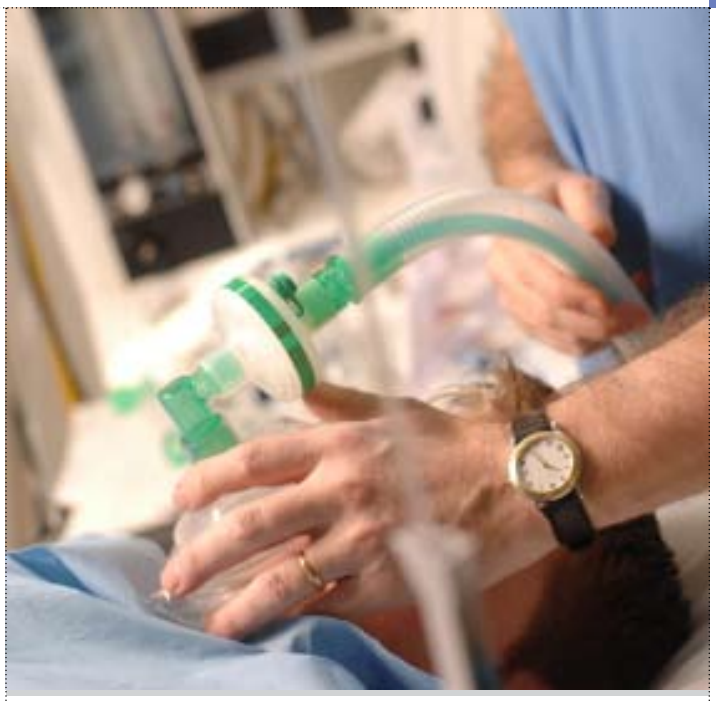
Single-shot spinal, CSE or epidural is preferred to general anaesthesia for Caesarean section as it is generally considered safer as the patient remains conscious and in control of her own airway thereby minimising the occurrence of catastrophic airway failure that may occur in obstetric general anaesthesia leading possibly to aspiration pneumonitis and hypoxic brain injury.



The Royal College of Anaesthetists has recommended that at least 95% of elective and 85% of emergency sections should be performed under regional blockade . Single-shot spinal and CSE are the most frequent techniques employed. Anaesthesia from the fourth thoracic to the fifth sacral dermatome is required for acceptable anaesthesia for Caesarean section. To achieve this, a small volume of 0.5% hyperbaric bupivaciane is given often with longer acting opioid, such as intrathecal diamorphine, which contributes to post-operative analgesia with paracetamol and NSAIDs as adjuncts.

Complications of spinal anaesthesia include:

- Hypotension due to sympathetic blockade (aorto-caval compression is minimised by a 15 degree lateral tilt).
- Total Spinal – a high block above T4 which may cause hypotension, bradycardia (cardiac sympathetic nerves blocked) and respiratory compromise with respiratory arrest if the brain stem is involved.
- Rare complications include spinal haematoma and abscess.
- Meningitis has been reported in conjunction with CSE.



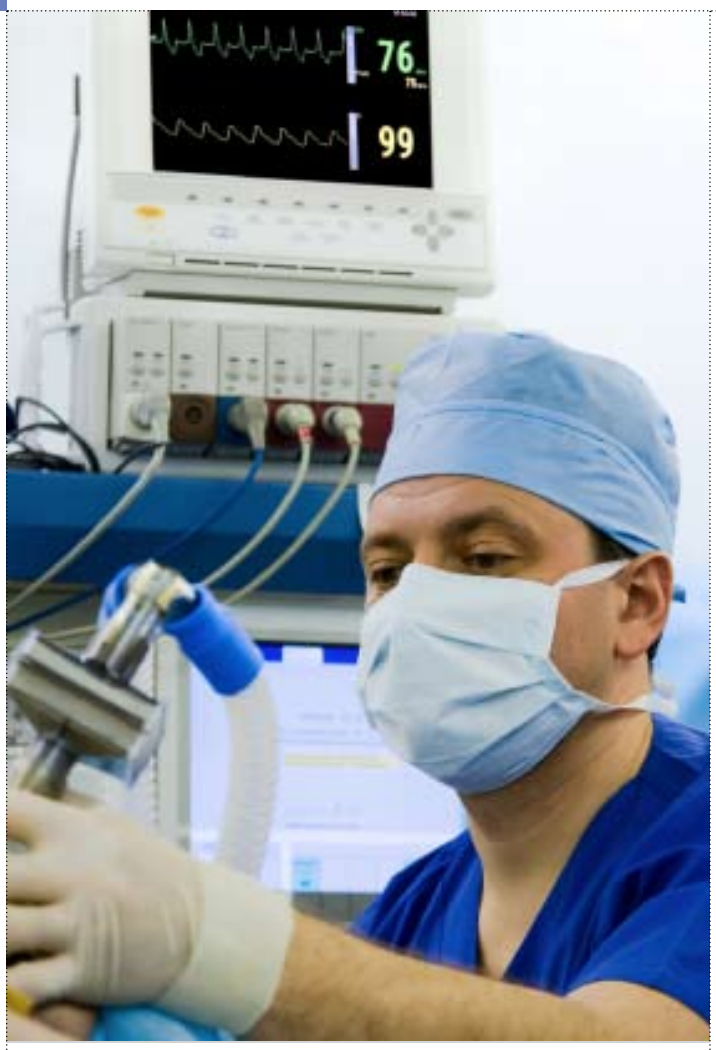
General anaesthesia

General anaesthesia will always have a place in obstetric anaesthetic practice when regional anaesthesia for Caesarean section is contraindicated. It is generally considered that general anaesthesia is less safe than regional techniques because of the potential for life-threatening airway problems and pulmonary aspiration of gastric contents but general anaesthesia is quick in emergency situations and never fails. Airway anatomy may deteriorate during pregnancy due to tissue congestion and acute airway oedema may supervene rapidly during general anaesthesia in pre-eclampsia. The incidence of difficult and failed intubation in obstetrics is approximately 10 times more common than in the non-obstetric surgical population. Additionally, the incidence of all anaesthetic complications is raised in the obese surgical population. The use of H2 receptor antagonist drugs and the oral administration of 0.3M sodium citrate immediately prior to induction of general anaesthesia minimises pulmonary damage should aspiration of gastric contents occur. Should intubation be difficult or impossible after induction of anaesthesia the priority is oxygen delivery to the patient (i.e. ventilate and oxygenate). If ventilation by hand or with other airway devices, such as the laryngeal mask airway, is impossible then a surgical airway (cricothyroidotomy) is indicated as a life saving manoeuvre.

The possibility of awareness under anaesthesia (i.e. inadequate depth of anaesthesia in combination with neuromuscular blockade) has previously been a consideration in obstetric anaesthesia when anaesthetists were reluctant to use higher concentrations of volatile agents in an attempt to minimise foetal compromise.

ANAESTHESIA AND ANALGESIA IN OBSTETRICS

Liam McLoughlin and Sofia Amiruddin



Factors influencing choice of anaesthesia:

- Patient choice
- Previous abdominal surgery or multiple Caesarean sections. Spinals usually provide approximately 2 hours of surgical anaesthesia. If the surgery is likely to be prolonged then a combined spinal-epidural or general anaesthetic may be preferable
- Previous back surgery or injuries may make regional anaesthesia difficult or impossible
- Intravenous drug users or history or chronic pain. Pain management is usually easier with regional techniques
- Haemodynamic instability. Regional anaesthesia may further compromise this because of vasodilatation
- Difficult Airways. If patients have had previously difficult intubation or have other indication that they may have a difficult airway, regional anaesthesia may be the safer choice
- Comorbidities such as fixed cardiac output states, pulmonary disease, sepsis, embolic disease requiring anticoagulation
- Adverse reaction to drugs, for example, allergy to local anaesthetics or previous history or malignant hyperpyrexia or suxamethonium apnoea (conditions triggered by inhaled anaesthetic agents and suxamethonium).

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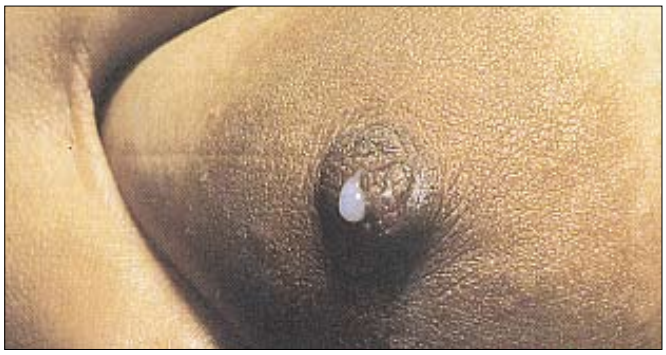
PICTURE QUIZ

Mandeep Kaler, Amita Mahendru and MA Khaled

A great time to test your knowledge.
Picture Quiz.

1) A 25-year-old female presented to the GP with a 1-year history of secondary amenorrhoea. Over the past 6 months, she and her partner have been trying to conceive. Otherwise she is fit and healthy. Clinical examination revealed a normal body mass index and the following finding:



a) What is illustrated in the photograph?
b) What are the possible differential diagnoses?
c) How will you establish a diagnosis?
d) How will you treat her?

a) This picture suggests the presence of galactorrhoea. This is defined as the discharge of milk or a milk-like secretion from the breast in the absence of pregnancy or greater than 6 months post-partum without breastfeeding[1].

b) Lactation requires the presence of oestrogen, progesterone and most importantly, prolactin. Stress, suckling, sleep, sexual intercourse and medications may increase prolactin levels. The differential diagnosis of galactorrhoea includes:

- Physiological conditions (14%): pregnancy and post-partum state, breast stimulation and neonates
- Neoplastic processes (18%): pituitary prolactinomas, bronchogenic carcinoma, renal adenocarcinoma, lymphoma, craniopharyngioma, hydatidiform mole and hypernephroma
- Hypothalamic–pituitary disorders (<10%): craniopharyngioma and other tumours, infiltrating conditions, such as sarcoidosis, tuberculosis, schistosomiasis and multiple sclerosis
- Systemic diseases (<10%): hypothyroidism, chronic renal failure, Cushing disease and acromegaly
- Drugs and herbal treatments (20%): phenothiazines, haloperidol, metoclopramide, cimetidine, reserpine, methyldopa, oral contraceptives and others
- Rarer causes: chest wall irritation (<10%), herpes zoster, breast surgery, burns, spinal cord injury/tumours/surgery, and in some cases of PCOS
- Idiopathic(35%): hyperprolactinaemia and euprolactinaemia[2]

c) To evaluate galactorrhoea[2]:

- History: it is important to gain a detailed history. Include the duration of symptoms, previous pregnancies and other symptoms, such as infertility, loss of libido, acne, hirsutism and menstrual irregularity. The presence of menstrual irregularities suggests low oestrogen levels which may result in decreased bone density. Symptoms of an intracranial mass can present with visual field defects, cranial nerve palsy and a headache. The history should be completed with a systemic review and social history specifically enquiring about illicit drug use.
- Physical examination: examine the patient's visual fields, thyroid gland and include microscopic examination of the breast discharge if it is suspicious of milk.

Laboratory investigations:
Serum pregnancy test
Prolactin levels: two levels are taken at different times of the day due to physiological fluctuations (laboratory reference values are used)
Thyroid function tests
Serum cortisol, growth hormone, and insulin-like growth factor levels
Renal function tests (to exclude other causes)

- Imaging studies: MRI scan of the brain is used to detect pituitary tumours and other intracranial lesions. This is the investigation of choice if symptoms are suggestive of an intracranial mass or if galactorrhoea is associated with menstrual disturbances (due to the effect on GnRH).

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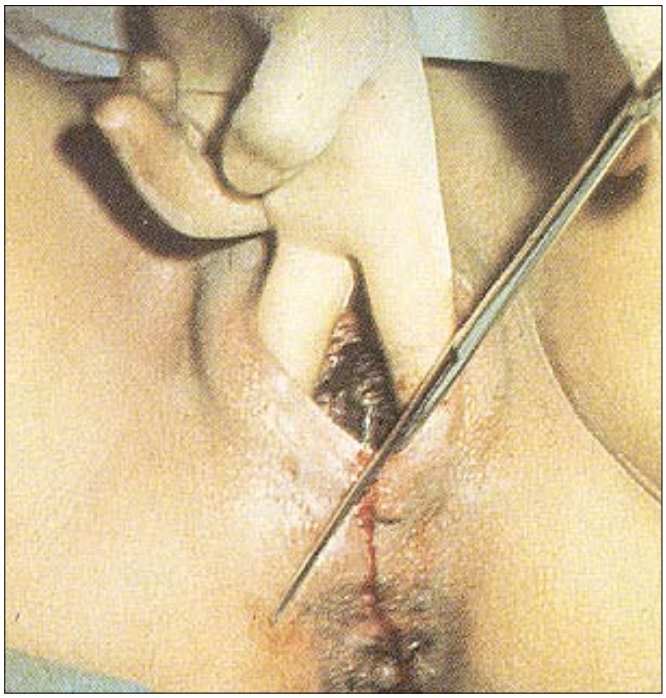
d) The management aims to treat or decrease the patient's symptoms, and treat any underlying causes. Hyperprolactinemia, possibly through its effect on oestrogen, increases the risk of developing osteoporosis. This risk can be reduced with medical therapy using dopamine agonists, even in the absence of a tumour. If a diagnosis of a pituitary adenoma is confirmed the initial treatment is with dopamine antagonists; either bromocriptine or cabergoline. They both act to reduce tumour size. Treatment is continued until the menstrual cycle has normalised and levels of prolactin have returned to within a normal range. Throughout, treatment is monitored with regular pituitary imaging or visual field testing. Evidence suggests 10% of patients may have spontaneous remission. Bromocriptine is contraindicated during pregnancy. In addition, the patient is closely monitored by a multidisciplinary team including an endocrinologist and ophthalmologist.

2) What common obstetric procedure is being performed?



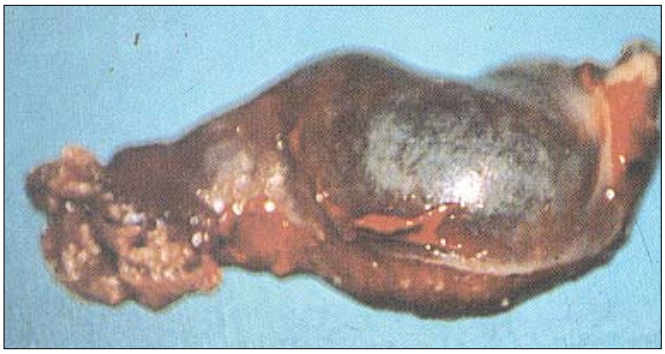
a) What procedure is being performed?
b) When is it performed?
c) What type of episiotomy is commonly carried out?
d) What are the layers involved in its repair?
e) What are the complications?

a) An episiotomy.

b) An episiotomy is commonly performed in cases of forceps delivery or other instrumental deliveries where the perineum is very rigid and delivery may lead to an inevitable tear. It may be required with a normal delivery where either there is evidence of delay due to a rigid perineum or foetal compromise. Other deliveries requiring an episiotomy include a breech delivery or the presence of shoulder dystocia. It is usually performed when the head is crowning during a contraction with the perineum maximally distended.

c) A mediolateral episiotomy, shown in the image above, is commonly performed to avoid injury to the anal sphincter. Prior to the procedure local analgesia/regional block is employed.
d) The layers repaired are; vaginal mucosa, muscle and skin.
e) Complications of an episiotomy are: bleeding, infection, haematoma, wound dehiscence, extension of episiotomy or fistula formation[3].

3) A 30-year-old female at 6-weeks gestation, presented to the accident and emergency department with severe left-sided lower abdominal pain and vaginal bleeding. Clinical examination reveals an acute abdomen. An urgent ultrasound scan suggested a 3 x 4cm mass in the left adnexa. A laparoscopy was performed and the following specimen was sent to histology.



a) What specimen is shown above?
b) What are the differential diagnoses in this case?
c) What are the management options?

a) The specimen demonstrates a salpingectomy with an ectopic pregnancy, which had not ruptured.
b) The differential diagnoses include a threatened miscarriage, twisted ovarian cyst and an ectopic pregnancy.
c) The management options are as follows[4]:

- Conservative management is appropriate if the patient was asymptomatic with falling BHCG hormone levels, suggesting a failing pregnancy.
- A laparoscopic salpingectomy as performed in this case; or a laparoscopic salpingostomy where an incision is made on the fallopian tube and the trophoblastic tissue is removed from the tube. This is carried out in cases where the other fallopian tube is either absent or damaged.
- The third option is to perform a laparotomy and salpingectomy, which is the procedure of choice when presented with a haemodynamically unstable patient with a haemoperitoneum. Furthermore if the tube is inaccessible with laparoscopy as a result of adhesions a laparotomy is performed.

PICTURE QUIZ

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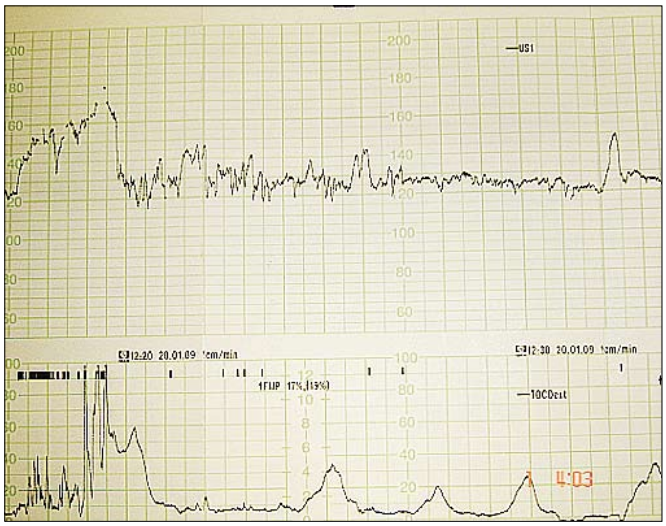
4) A 26-year-old diabetic female, who is currently 36-weeks pregnant presented to labour ward with a history of abdominal pain for the past 24 hours. She is extremely upset and distressed. The midwife attending to her initiates cardiotocography monitoring. A print out of the cardiotocograph is shown below.



a) What is cardiotocography?
b) When should CTG be used?
c) How is a CTG interpreted?
d) What are the problems associated with CTG monitoring?
e) Interpret the CTG shown above?

a) Cardiotocography is a term used for electronic foetal monitoring during the intrapartum period of pregnancy. It is defined as the use of electronic foetal heart rate monitoring for the evaluation of foetal well-being in labour. The main principle of this type of monitoring is to detect foetal hypoxia; and therefore prevent foetal acidosis and cell damage.

b) Monitoring can be continuous or intermittent.

- Continuous CTG monitoring is recommended if the following risk factors are present:

Maternal problems	Foetal problems
Previous caesarean section	Foetal growth restricted
Pre-eclampsia	Prematurity
Diabetes	Multiple pregnancies
Induced labour	Meconium stained
Prolonged membrane rupture	liquor
Antepartum haemorrhage	Breech presentation
Post term pregnancy	Oligohydramnios
Other maternal medical disease	

- Continuous monitoring is also necessary if intrapartum risk factors, such as oxytocin augmentation, epidural analgesia, maternal pyrexia and vaginal bleeding in labour are present.
- If these risk factors are absent intermittent CTG monitoring is adequate. This includes 15 minutes in the first stage and 5 minutes in the second stage of labour.

c) There are four features of a CTG that are most important: baseline rate, variability, decelerations and accelerations. A CTG can be classified as:

- Normal: all four features fall into the reassuring category
- Suspicious: one feature falls into the non-reassuring category with the remaining three reassuring
- Pathological: two or more features are non-reassuring or one or more of the features are abnormal

	Baseline rate (bpm)	Variability (bpm)	Decelera-tions	Accelerations
Reassuring	110–160	≥5	None	Present
Non-reassuring	100–109 161–180	<5 or ≥40 <90	Early decelerations Variable decelerations Prolonged decelerations (> 3 minutes)	Absent
Abnormal	<100 >180	<5 or ≥90 minutes	Late decelerations Prolonged decelerations (>3 minutes)	Absent

A widely used pneumonic can be used to interpret CTGs: DR C BRAVADO[5]

DR: Determine the Risk in the pregnancy
C: Contractions
BR: Baseline heart Rate
V: Variability
A: Accelerations
D: Decelerations
O: Overall (normal, suspicious or pathological).

PICTURE QUIZ

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d) An inadequate quality CTG may be a result of poor contact with the external transducer. To overcome this problem check the position of the transducer and ensure the female is not lying supine. If possible try to get the woman to adopt the left lateral position. However, if the trace remains inadequate a foetal scalp electrode may be considered.

e) Interpretation of the CTG using the DR C BRAVADO pneumonic:

DR: High Risk – diabetic
C: 3 in 10 minutes
BR: 130bpm
V: > 5bpm
A: present
D: absent
O: normal CTG

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