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Miscarriage

Synonym: spontaneous abortion

Miscarriage is defined as the loss of a pregnancy before 24 weeks of gestation[1] . Ectopic pregnancy and gestational trophoblastic disease are not included.

Bleeding after 24 weeks is termed 'antepartum haemorrhage'.

Types of miscarriage

- **Threatened miscarriage**: mild symptoms of bleeding. Usually little or no pain. The cervical os is closed.
- **Inevitable miscarriage**: usually presents with heavy bleeding with clots and pain. The cervical os is open. The pregnancy will not continue and will proceed to incomplete or complete miscarriage.
- **Incomplete miscarriage**: this occurs when the products of conception are partially expelled. Many incomplete miscarriages can be unrecognised missed miscarriages.
- **Complete miscarriage**: presents with a history of confirmed intrauterine pregnancy, followed by heavy bleeding and clots but a subsequent ultrasound scan shows no pregnancy tissue in the uterine cavity. (If the pregnancy has not previously been confirmed as intrauterine on an ultrasound scan, it is described as a 'pregnancy of unknown location'.)
- **Missed miscarriage**: the fetus is dead but retained. Also described as early fetal demise, empty sac or blighted ovum.The uterus is small for dates. A pregnancy test can remain positive for several days or even weeks in some cases. It presents with a history of threatened miscarriage and persistent, dark-brown discharge. Early pregnancy symptoms may have decreased or gone.
- Recurrent miscarriage**:** three or more consecutive miscarriages.

Causes of miscarriage (aetiology)[2]

Often no cause is found but common recognised causes of miscarriage include:

- Abnormal fetal development.
- Genetically balanced parental translocation.

- Uterine abnormality.
- Incompetent cervix (second trimester).
- Placental failure.
- Multiple pregnancy.
- Polycystic ovary syndrome.
- Antiphospholipid syndrome.
- Inherited thrombophilias.
- Infections.
- Poorly controlled diabetes.
- Poorly controlled thyroid disease.

Miscarriage epidemiology

- Early pregnancy loss accounts for 50,000 hospital admissions in the UK annually[3] .
- Miscarriage occurs in 12-24% of recognised pregnancies; the true rate is probably higher as many may occur before a woman has realised she is pregnant[2] .
- The risk falls rapidly with advancing gestation[4] :
  - 9.4% at 6 complete weeks of gestation.
  - 4.2% at 7 weeks.
  - 1.5% at 8 weeks.
  - 0.5% at 9 weeks.
  - 0.7 % at 10 weeks.

Risk factors of miscarriage[5]

- Age: miscarriage is more frequent in women aged >30 years and even more common in those aged >35 years (due to an increased risk of random chromosomal abnormalities).
- Cigarette smoking: the risk increases with smoking while pregnant and with the amount smoked[6] .
- Excess alcohol. Even low amounts - four units a week of alcohol consumption during early pregnancy - have been shown to increase the risk of spontaneous miscarriage substantially[7] .

- Low pre-pregnancy BMI.
- Paternal age >45 years (independent of maternal age).
- Fertility problems and taking longer to conceive.
- Illicit drug use.
- Uterine surgery or abnormalities - eg, incompetent cervix.
- Connective tissue disorders (systemic lupus erythematosus, antiphospholipid antibodies - lupus anticoagulant/anticardiolipin antibody).
- Uncontrolled diabetes mellitus.
- Being stressed, anxious or experiencing one or more stressful or traumatic events.

A previous live birth, nausea and eating a healthy diet are all protective factors.

Socio-economic status, working full time, short pregnancy interval, heavy lifting and strenuous exercise do not appear to increase the risk of miscarriage. Nor is obesity a risk factor, except in obese women who have become pregnant following assisted conception.

An association between low vitamin D levels and an increased risk of first-trimester miscarriage has been identified but it is not known if it is causal[8] .

Miscarriage symptoms (presentation)

- Most cases present with vaginal bleeding and pain that is worse for the patient than a period.
- The patient may also have seen products of conception but may not recognise them as such.
- Approximately half of women with a threatened miscarriage will go on to have a complete miscarriage. This is most likely if they have bleeding that is increasing, bleeding that is heavier than a normal menstrual period or bleeding with clots.
- A history of continued pregnancy-associated vomiting associated with bleeding in early pregnancy decreases the risk of miscarriage to approximately 30%.

- There are signs to look for in cases of first-trimester bleeding:
    - Is the patient shocked through blood loss? If so, pelvic and speculum examination are indicated:
        - Are there products of conception in the cervical canal? (Remove with sponge forceps.)
        - Is the cervical os open? (External os of multigravida usually admits the tip of the finger.)
        - Is bleeding from cervical lesions and not from the uterus?
        - Is the uterine size appropriate for dates?

Differential diagnosis

- Ectopic pregnancy:
    - The single most important diagnosis to exclude.
    - In ectopic pregnancy, the pain is usually great, may be unilateral and usually precedes the bleeding.
    - Compared to a miscarriage, the loss is usually less heavy and darker - almost black in some cases - and there is acute pain on manipulating the cervix (cervical excitation).
- Implantation bleed (occurs when a fertilised egg embeds itself in the lining of the uterus).
- Cervical polyp.
- Cervical ectropion.
- Cervicitis/vaginitis.
- Neoplasia.
- Hydatiform mole.

Diagnosis of viable intrauterine pregnancy[3]

- Transvaginal ultrasound scan to identify the location of the pregnancy and whether there is a fetal pole and heartbeat. If a transvaginal ultrasound scan is unacceptable to the woman, offer a transabdominal ultrasound scan and explain the limitations of this method of scanning.
- Diagnosis of miscarriage using one ultrasound scan cannot be guaranteed to be 100% accurate and there is a small chance that the diagnosis may be incorrect, particularly at very early gestational ages. Further scans may be needed before a diagnosis can be made.

- Gestational age from the last menstrual period alone should not be used to determine whether a fetal heartbeat should be visible. The date of their last menstrual period may not give an accurate representation of gestational age because of variability in the menstrual cycle.
- When diagnosing complete miscarriage on an ultrasound scan, in the absence of a previous scan confirming an intrauterine pregnancy, always be aware of the possibility of a pregnancy of unknown location. Advise these women to return for follow-up (for example, hCG levels, ultrasound scans) until a definitive diagnosis is obtained.
- Take two serum hCG measurements as near as possible to 48 hours apart (but no earlier) to determine subsequent management of a pregnancy of unknown location.
- A woman with an increase in serum hCG levels greater than 63% after 48 hours is likely to have a developing intrauterine pregnancy (although the possibility of an ectopic pregnancy cannot be excluded):
    - Offer a transvaginal ultrasound scan to determine the location of the pregnancy between 7 and 14 days later. Consider an earlier scan if serum hCG level is greater than or equal to 1,500 IU/litre.
    - If a viable intrauterine pregnancy is confirmed, offer her routine antenatal care.
    - If a viable intrauterine pregnancy is not confirmed, refer for immediate clinical review by a senior gynaecologist.
- For a woman with a decrease in serum hCG levels greater than 50% after 48 hours, the pregnancy is unlikely to continue but this is not confirmed. Advise a urine pregnancy test 14 days after the second serum hCG test:
    - If the test is negative, no further action is necessary.
    - If the test is positive, advise return to the early pregnancy assessment service for clinical review within 24 hours.
- For a woman with a decrease in serum hCG levels less than 50%, or an increase less than 63%, refer her for clinical review in the early pregnancy assessment service within 24 hours.

Rare causes of a raised hCG should also be borne in mind, including gestational trophoblastic disease or cranial germ cell tumour, which must be considered.

For women with a pregnancy of unknown location, when using serial serum hCG measurements, do not use serum progesterone measurements as an adjunct to diagnose either viable intrauterine pregnancy or ectopic pregnancy.

Miscarriage management[3]

Threatened miscarriage

Advise a woman with a confirmed intrauterine pregnancy with a fetal heartbeat who presents with vaginal bleeding, but has no history of previous miscarriage, that:

- If her bleeding gets worse, or persists beyond 14 days, she should return for further assessment.
- If the bleeding stops, she should start or continue routine antenatal care.

Offer vaginal micronised progesterone 400 mg twice daily to women with an intrauterine pregnancy confirmed by a scan, if they have vaginal bleeding and have previously had a miscarriage. If a fetal heartbeat is confirmed, continue progesterone until 16 completed weeks of pregnancy.

Expectant management

Use expectant management for 7 to 14 days as the first-line management strategy for women with a confirmed diagnosis of miscarriage. Explore management options other than expectant management if any of the following apply:

- The woman is at increased risk of haemorrhage (for example, she is in the late first trimester).
- She has previous adverse and/or traumatic experience associated with pregnancy (for example, stillbirth, miscarriage or antepartum haemorrhage).
- She is at increased risk from the effects of haemorrhage (for example, if she has coagulopathies or is unable to have a blood transfusion).
- There is evidence of infection.

If the resolution of bleeding and pain indicate that the miscarriage has completed during 7 to 14 days of expectant management, advise the woman to take a urine pregnancy test after three weeks, and to return for individualised care if it is positive.

Offer a repeat scan if after the period of expectant management, the bleeding and pain:

- Have not started (suggesting that the process of miscarriage has not begun); or
- Are persisting and/or increasing (suggesting incomplete miscarriage). Discuss all treatment options (continued expectant management, medical management and surgical management) with the woman to allow her to make an informed choice.

Review the condition of a woman who opts for continued expectant management of miscarriage at a minimum of 14 days after the first follow-up appointment.

Offer medical management to women with a confirmed diagnosis of miscarriage if expectant management is not acceptable to the woman.

Medical management

Evidence suggests that medical treatment, with misoprostol, and expectant care are both acceptable alternatives to routine surgical evacuation for incomplete miscarriage[1] .

- Do not offer mifepristone as a treatment for missed or incomplete miscarriage.
- Offer vaginal misoprostol for the medical treatment of missed or incomplete miscarriage. Oral administration is an acceptable alternative if this is the woman's preference.
- For women with a missed miscarriage, use a single dose of 800 micrograms of misoprostol.
- Advise the woman that if bleeding has not started 24 hours after treatment, she should contact her healthcare professional to determine ongoing individualised care.
- For women with an incomplete miscarriage, use a single dose of 600 micrograms of misoprostol. (800 micrograms can be used as an alternative to allow alignment of treatment protocols for both missed and incomplete miscarriage.)
- Offer all women receiving medical management of miscarriage pain relief and anti-emetics as needed.
- Inform women undergoing medical management of miscarriage about what to expect throughout the process, including the length and extent of bleeding and the potential side-effects of treatment including pain, diarrhoea and vomiting.
- Provide women with a urine pregnancy test to carry out at home three weeks after medical management of miscarriage unless they experience worsening symptoms, in which case advise them to return to the healthcare professional responsible for providing their medical management.
- Advise women with a positive urine pregnancy test after three weeks to return for a review by a healthcare professional to ensure that there is no molar or ectopic pregnancy.

Surgical management

Where clinically appropriate, offer women undergoing a miscarriage a choice of either:

- Manual vacuum aspiration under local anaesthetic in an outpatient or clinic setting.
- Surgical management in a theatre under general anaesthetic.

Anti-D rhesus prophylaxis

Offer anti-D rhesus prophylaxis at a dose of 250 IU (50 micrograms) to all rhesus-negative women who have a surgical procedure to manage an ectopic pregnancy or a miscarriage.

Do not offer anti-D rhesus prophylaxis to women who:

- Receive solely medical management for an ectopic pregnancy or miscarriage.
- Have a threatened miscarriage.
- Have a complete miscarriage.
- Have a pregnancy of unknown location.

Do not use a Kleihauer test for quantifying feto-maternal haemorrhage.

Miscarriage complications

- Expectant management has been shown to lead to a higher risk of incomplete miscarriage, need for unplanned (or additional) surgical emptying of the uterus, bleeding and need for transfusion[9] .
- After complete miscarriage, bleeding normally ceases within 10 days. If part of the placenta remains, bleeding may continue with cramps. If this occurs then a repeat ultrasound should be undertaken and surgery is often required.
- The 2014 triennial report from Mothers and Babies: Reducing Risk through Audit and Confidential Enquiries across the UK (MBRRACE-UK) into maternal deaths in the UK and Ireland, highlighted the importance that loss of a child, including by miscarriage, has on a woman's vulnerability to mental illness and that she will need additional monitoring and support[10] .

Prognosis

- Threatened miscarriage is associated with risk of subsequent preterm delivery.
- Increased risk of further miscarriages. After three miscarriages, consider as recurrent spontaneous miscarriage.
- In the UK there were 0.05-0.22 reported deaths due to miscarriage per 100,000 maternities in the period 1985-2008[2] .

Miscarriage prevention

Encourage:

- Reduction/cessation of alcohol consumption.
- Smoking cessation and stopping illicit drug use.

Whilst vitamin supplementation prior to, or in early pregnancy, does not prevent miscarriage, there is evidence that multivitamins with iron and folic acid do reduce the risk of stillbirth [11] .

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Originally Published: 20/11/2023	Next review date: 23/12/2021	Document ID: doc_1744