

PERINATAL EDUCATION PROGRAM

PRETERM LABOUR AND PRETERM RUPTURE OF THE MEMBRANES

UNIT 5

OBJECTIVES

When you have completed this unit you should be able to:

1. Define preterm labour and preterm rupture of the membranes.
2. Understand why these conditions are very important.
3. Understand the role of infection in causing preterm labour and preterm rupture of the membranes.
4. List which patients are at increased risk of these conditions.
5. Understand what preventive measures should be taken.
6. Diagnose preterm labour and preterm rupture of the membranes.
7. Manage these conditions.

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5-1 WHAT IS PRETERM LABOUR?

Preterm labour is diagnosed when there are REGULAR UTERINE CONTRACTIONS BEFORE 37 WEEKS of pregnancy, together with either of the following:

1. Cervical effacement and/or dilatation.
2. Rupture of the membranes.

5-2 WHAT IS PRETERM RUPTURE OF THE MEMBRANES?

Preterm rupture of the membranes is diagnosed when the MEMBRANES RUPTURE BEFORE 37 WEEKS, in the absence of uterine contractions.

**** Preterm rupture of the membranes (as defined above) is sometimes called preterm, prelabour rupture of the membranes in the literature.*

5-3 WHAT IS PRELABOUR RUPTURE OF THE MEMBRANES?

Prelabour rupture of the membranes is defined as RUPTURE OF THE MEMBRANES FOR AT LEAST 1 HOUR BEFORE THE ONSET OF LABOUR in a term pregnancy.

5-4 HOW SHOULD YOU DIAGNOSE PRETERM LABOUR IF THE GESTATIONAL AGE IS UNKNOWN?

Preterm labour is diagnosed if the estimated fetal weight is below 2500 g. The symphysis-fundus height will be less than 35 cm.

5-5 WHY ARE PRETERM LABOUR AND PRETERM RUPTURE OF THE MEMBRANES IMPORTANT?

Preterm labour and preterm rupture of the membranes are major causes of perinatal death because:

1. Preterm delivery, especially before 34 weeks, commonly results in the birth of an infant who develops hyaline membrane disease and other complications of prematurity.
2. Preterm labour and preterm rupture of the membranes are often accompanied by bacterial infection of the membranes and placenta, that may cause complications for both the mother and the fetus. The mother and fetus may develop severe infection, which is life threatening as described in 5-10.

5-6 WHAT IS THE COMMONEST KNOWN CAUSE OF PRETERM LABOUR AND PRETERM RUPTURE OF THE MEMBRANES?

In many cases the cause is unknown, but increasing evidence points to infection of the membranes and placenta as the commonest known cause of both preterm labour and preterm rupture of the membranes.

INFECTION OF THE MEMBRANES AND PLACENTA IS THE COMMONEST RECOGNIZED CAUSE OF PRETERM LABOUR AND PRETERM RUPTURE OF THE MEMBRANES

5-7 WHAT IS INFECTION OF THE MEMBRANES AND PLACENTA?

Infection of the membranes and placenta causes an acute inflammation of the placenta, membranes and decidua. This condition is called CHORIOAMNIONITIS. It may occur with intact or ruptured membranes.

Bacteria from the cervix and vagina spread through the endocervical canal to infect the membranes and placenta. Later these bacteria may colonise the liquor, from where they may infect the fetus.

Chorioamnionitis may cause the release of prostaglandins which in turn stimulate uterine contractions and cause the onset of labour. Chorioamnionitis may also weaken the membranes and lead to their rupture. If the membranes have already been ruptured due to other causes, such as polyhydramnios, vaginal bacteria can spread directly into the liquor. The longer the duration of ruptured membranes, the greater is the risk of chorioamnionitis. The risk of infection is also increased by digital vaginal examinations after rupture of the membranes.

*** *After delivery, the diagnosis of chorioamnionitis can be confirmed by:*

1. *Noting that the infant and placenta have an offensive smell.*
2. *Noting that the membranes are cloudy.*
3. *Finding pus cells and bacteria on microscopic examination of the infant's gastric aspirate immediately after birth.*
4. *Finding acute inflammation in the membranes and placenta on histology after delivery.*

INFECTION OF THE MEMBRANES AND PLACENTA (CHORIOAMNIONITIS) MAY OCCUR WITH EITHER INTACT OR RUPTURED MEMBRANES

5-8 WHAT IS THE CLINICAL PRESENTATION OF CHORIOAMNIONITIS?

Usually chorioamnionitis is asymptomatic (subclinical chorioamnionitis) and, therefore, the clinical diagnosis is often not made. However, the following signs may be present:

1. Fetal tachycardia.
2. Maternal pyrexia and/or tachycardia.
3. Tenderness of the uterus.
4. Drainage of offensive liquor, if the membranes have ruptured.

If any of the above signs are present, a diagnosis of CLINICAL CHORIOAMNIONITIS must be made.

*** *Daily white blood cell counts are no more helpful than clinical signs in making an early diagnosis of chorioamnionitis.*

5-9 WHAT FACTORS MAY PREDISPOSE TO CHORIOAMNIONITIS?

1. Rupture of the membranes.
2. Exposure of the membranes due to dilatation of the cervix.
3. Coitus during the second half of pregnancy.

However, in many cases, the factors that result in chorioamnionitis are not known.

5-10 CAN CHORIOAMNIONITIS CAUSE COMPLICATIONS DURING THE PUERPERIUM?

Yes. Chorioamnionitis may cause infection of the genital tract (puerperal sepsis) which, if not treated correctly, may result in septicaemia, the need for hysterectomy, and possibly in maternal death. These complications can usually be prevented by starting a course of broad spectrum antibiotics (e.g. ampicillin plus metronidazole), as soon as the diagnosis of clinical chorioamnionitis is made.

Bacteria that have colonised the amniotic fluid, may infect the fetus and the infant may present with signs of infection at or soon after birth.

5-11 WHAT FACTORS OTHER THAN CHORIOAMNIONITIS CAN LEAD TO PRETERM LABOUR AND PRETERM RUPTURE OF THE MEMBRANES?

The following maternal, fetal and placental factors may be associated with preterm labour and/or preterm rupture of the membranes:

1. MATERNAL FACTORS:

- (i) Pyrexia, as the result of an acute infection other than chorioamnionitis, e.g. acute pyelonephritis or malaria.
- (ii) Uterine abnormalities, such as congenital uterine malformations (e.g. septate or bicornuate uterus) and uterine myomas (fibroids).
- (iii) Incompetence of the internal cervical os ("cervical incompetence").

2. FETAL FACTORS:

- (i) A multiple pregnancy.
- (ii) Polyhydramnios (both cause overdistension of the uterus.)
- (iii) Congenital malformations of the fetus.
- (iv) Syphilis.

3. PLACENTAL FACTORS:

- (i) Placenta praevia.
- (ii) Abruptio placentae.

**** Polyhydramnios, multiple pregnancy and cervical incompetence cause preterm dilatation of the cervix with exposure of the membranes to the vaginal bacteria. This may predispose to chorioamnionitis. Polyhydramnios has several causes, but it is important to remember that oesophageal atresia is one of the causes which need to be excluded after delivery.*

5-12 WHICH PATIENTS ARE AT AN INCREASED RISK OF PRETERM LABOUR OR PRETERM RUPTURE OF THE MEMBRANES?

Both preterm labour and preterm rupture of membranes are more common in patients who:

- 1. Have a past history of preterm labour.
- 2. Have no antenatal care.
- 3. Live in poor socio-economic circumstances.
- 4. Smoke, use alcohol or abuse habit-forming drugs.
- 5. Are underweight due to undernutrition.
- 6. Have coitus in the 2nd half of pregnancy, when they are at an increased risk of preterm labour.
- 7. Have any of the maternal, fetal or placental factors listed in 5-11.

THE MOST IMPORTANT RISK FACTOR FOR PRETERM LABOUR IS A PREVIOUS HISTORY OF PRETERM DELIVERY

5-13 WHAT CAN BE DONE TO DECREASE THE INCIDENCE OF THESE COMPLICATIONS?

- 1. Take measures to ensure that all pregnant women receive antenatal care.
- 2. Identify patients with a past history of preterm labour.
- 3. Give advice about the dangers of smoking, alcohol and the use of habit-forming drugs.
- 4. Advise against coitus during the late 2nd and in the 3rd trimester in pregnancies at high risk for preterm labour or preterm rupture of the membranes. If coitus occurs during pregnancy in these patients, the use of condoms must be recommended as this may reduce the risk of chorioamnionitis.
- 5. Inset a McDonald suture at 14-16 weeks, in patients with a proven incompetent internal cervical os.
- 6. Prevent teenage pregnancies.
- 7. Improve the socio-economic and nutritional status of poor communities.
- 8. Arrange that the workload of women, who have to do heavy manual labour, is decreased when they are pregnant and that an opportunity to rest during working hours is allowed.

5-14 HOW SHOULD YOU MANAGE A PATIENT AT INCREASED RISK OF PRETERM LABOUR OR PRETERM RUPTURE OF THE MEMBRANES?

1. Patients at increased risk must have 2 weekly vaginal examinations from 24 weeks, in order to make an early diagnosis of preterm cervical effacement and/or dilatation.
2. In all women with cervical effacement or dilatation before 34 weeks, the following preventive measures can then be taken:
 - (i) Bed rest. This can be at home, except when the home circumstances are poor, in which case the patient should be admitted to hospital.
 - (ii) Sick leave must be arranged for working patients.
 - (iii) Coitus must be forbidden.
 - (iv) Advice must be given to report immediately, if contractions or rupture of the membranes occur.
 - (v) Women with preterm labour or preterm rupture of the membranes must be seen as soon as possible, and the correct measures taken to prevent the delivery of a severely preterm infant.

ALL PATIENTS SHOULD BE TOLD TO IMMEDIATELY REPORT PRETERM LABOUR OR PRETERM RUPTURE OF THE MEMBRANES

5-15 WHAT SHOULD YOU DO IF A PATIENT THREATENS TO DELIVER A PRETERM INFANT?

1. Infants born between 34 and 36 weeks can usually be cared for in a level 1 hospital.
2. However, women who threaten to deliver between 28 and 33 weeks, should be referred to a level 2 or 3 hospital with a neonatal intensive care unit.
3. If the birth of a preterm baby cannot be prevented, it must be remembered that the best incubator for transporting an infant is the mother's uterus. Even if the delivery is inevitable, an attempt to suppress labour should be made, so that the patient can be transferred before the infant is born.
4. The better the condition of the infant on arrival at the neonatal intensive care unit, the better is the prognosis.

DIAGNOSIS OF PRETERM LABOUR AND PRETERM RUPTURE OF THE MEMBRANES**5-16 HOW SHOULD YOU DISTINGUISH BETWEEN BRAXTON HICKS CONTRACTIONS AND THE CONTRACTIONS OF PRETERM LABOUR?**

Braxton Hicks contractions:

1. Are irregular.
2. May cause discomfort but are not painful.
3. Do not increase in duration or frequency.
4. Do not cause cervical effacement or dilatation.

The duration of contractions cannot be used as Braxton Hicks contractions may last up to 60 seconds.

In contrast, the contractions of preterm or early labour:

1. Are regular, at least one per 10 minutes.
2. Are painful.
3. Increase in frequency and duration.
4. Cause effacement and dilatation of the cervix.

5-17 HOW SHOULD YOU CONFIRM THE DIAGNOSIS OF PRETERM LABOUR?

Both of the following will be present in a patient of less than 37 weeks gestation:

1. Regular uterine contractions, palpable on abdominal examination, of at least one per 10 minutes.
2. A history of rupture of the membranes, or cervical effacement and/or dilatation, on vaginal examination.

5-18 HOW CAN YOU DIAGNOSE PRETERM RUPTURE OF THE MEMBRANES?

1. A patient of less than 37 weeks gestation will give a history of sudden drainage of liquor followed by a continual leak of smaller amounts, without associated uterine contractions.
2. A sterile speculum examination will confirm the diagnosis of ruptured membranes.
3. A DIGITAL VAGINAL EXAMINATION MUST NOT BE DONE as it is of little value in diagnosing rupture of the membranes and may increase the risk of infection.

A DIGITAL VAGINAL EXAMINATION MUST NOT BE DONE IN PRETERM RUPTURE OF THE MEMBRANES
5-19 WHAT IS THE VALUE OF A STERILE SPECULUM EXAMINATION WHEN PRETERM RUPTURE OF THE MEMBRANES IS SUSPECTED?

1. The danger of ascending infection is not increased by this procedure.
2. Observing drainage of liquor from the cervical os confirms the diagnosis of ruptured membranes.
3. If no drainage of liquor is observed, drainage can sometimes be seen if the patient is asked to cough.
4. If no drainage of liquor is seen, a smear should be taken from the posterior vaginal fornix with a wooden spatula to determine the pH and to test for ferning.
5. The possibility of cord prolapse can be excluded or confirmed.
6. It is also important to see whether the cervix is long and closed, or whether there is already clear evidence of cervical effacement and/or dilatation.
7. A patient with a profuse vaginal discharge may think that she is draining liquor. A speculum examination will help to confirm or rule out this possibility.

**** If the facilities are available, the following can also be done when there is preterm rupture of the membranes:*

1. An endocervical swab is taken to culture for Group B Streptococcus and Gonococcus.
2. As much liquor as possible can be drawn up out of the vagina with a syringe, for tests of lung maturity.

5-20 HOW SHOULD YOU TEST THE VAGINAL pH?

1. The pH of the vagina is acid but the pH of liquor is alkaline.
2. Red litmus paper is pressed against the moist spatula. If the red litmus changes to blue, then liquor is present in the vagina, indicating that the membranes have ruptured.

5-21 HOW WILL YOU TEST FOR FERNING?

1. The vaginal fluid on the wooden spatula is spread on a microscope slide and allowed to dry.
2. The slide is then examined under the low power lens of a microscope. An unmistakable pattern of a fern leaf will be observed if the specimen is liquor.

MANAGEMENT OF PRETERM LABOUR

5-22 HOW WILL YOU MANAGE A PATIENT IN PRETERM LABOUR?

STEP 1.

Listen to the fetal heart to rule out fetal distress and determine the duration of pregnancy as accurately as possible:

1. If fetal distress is present and the fetus is assessed to be viable (28 weeks or more), then the infant must be delivered as soon as possible.
2. If the pregnancy is 34 weeks or more, labour should be allowed to continue.
3. If the infant is assessed to be 24 weeks or more but less than 34 weeks, other contra-indications for the suppression of preterm labour must be excluded. Subsequently the contractions should be suppressed with a calcium channel blocker, e.g. nifedipine (Adalat), or a beta2 stimulant, e.g. hexoprenaline (Ipradol). The further management of these patients must take place in a level 2 or 3 hospital.

STEP 2.

Look for treatable causes of preterm labour, e.g. urinary tract infection or malaria.

The management of a patient with preterm labour is summarised in flow diagram 5-1.

5-23 WHAT ARE THE CONTRA-INDICATIONS TO THE SUPPRESSION OF PRETERM LABOUR?

1. Fetal distress.
2. A pregnancy where the duration is 34 weeks or more, or 24 weeks or less.
3. Chorioamnionitis.
4. Intra-uterine death.
5. Congenital abnormalities incompatible with life.
6. Pre-eclampsia.
7. Antepartum haemorrhage of unknown cause.
8. Cervical dilatation of more than 6 cm. (However, contractions should be temporarily suppressed while the patient is being transferred to a hospital where preterm infants can be managed.)
9. Severe intra-uterine growth restriction.

**** Antepartum haemorrhage of unknown cause may be due to a small abruptio placentae. It is, therefore, advisable not to suppress labour should it occur.*

5-24 HOW WILL YOU DECIDE THAT A PATIENT IS LESS THAN 34 WEEKS PREGNANT IF THE DURATION OF THE PREGNANCY IS UNKNOWN?

This is done by measuring the symphysis-fundus height and by doing a complete abdominal examination.

Labour must be suppressed if the estimated fetal weight is less than 2000 g or the estimated gestational age less than 34 weeks. The symphysis-fundus height measurement will be less than 33 cm.

5-25 HOW SHOULD YOU GIVE NIFEDIPINE FOR THE SUPPRESSION OF PRETERM LABOUR?

1. Three nifedipine (Adalat) 10 mg capsules (total 30 mg) should be taken by mouth. If there are no further contractions and no continuing cervical dilatation and effacement, 20 mg should be given 8 hourly.
2. If there are still contractions with cervical dilatation and effacement 3 hours after the initial dose, a second dose of 20 mg should be given, followed by 8 hourly doses.

Nifedipine (Adalat) has fewer side effects than hexoprenaline for the mother. Following the latest research, nifedipine (adalat) has been recommended as the drug of choice in suppressing uterine contractions.

5-26 WHAT ARE THE CONTRA-INDICATIONS TO THE USE OF BETA2 STIMULANTS IN SUPPRESSING LABOUR?

1. Heart valve disease. The use of beta2 stimulants, such as hexoprenaline, can endanger the patient's life, especially if she has a narrowed heart valve, e.g. mitral stenosis.
2. A shocked patient.
3. A patient with a tachycardia, e.g. as the result of an acute infection.

5-27 HOW SHOULD YOU USE HEXOPRENALINE FOR THE SUPPRESSION OF PRETERM LABOUR?

1. Two ampoules (2 x 2 ml = 10 mg) of hexoprenaline (Ipradol) are administered slowly (0,5 ml per minute) intravenously while the maternal heart rate is carefully monitored for a tachycardia.
2. Six ampoules (30 mg) hexoprenaline (Ipradol) in 200 ml saline are then administered as a side infusion. The speed of administration is determined by the mother's pulse rate. Start at 10 drops per minute and increase by 5 drops every 10 minutes, until the contractions have stopped or the maternal pulse rate reaches 120 beats per minute.
3. The administration of the hexoprenaline infusion is continued until there have been no further contractions, or effacement and/or dilatation of the cervix for at least 6 hours.
4. The patient must be warned that hexoprenaline causes tachycardia (palpitations).

If the contractions are still occurring, and there is progressive effacement and dilatation of the cervix in spite of an adequate rate of administration, alternative measures must be taken to suppress labour. Otherwise, administration of the drug should be stopped and preparation made for the delivery of a preterm infant.

5-28 WHAT ADDITIONAL ACTION MUST YOU TAKE TO SUPPRESS LABOUR?

Prostaglandin antagonists, e.g. indomethacin (Indocid), are prescribed. One indomethacin 100 mg rectal suppository is administered 12 hourly. Two doses are usually sufficient. The total dose should not exceed 4 doses (i.e. over 48 hours).

The following side effects make indomethacin potentially dangerous:

1. Gastrointestinal irritation.
2. Suppression of platelet function.
3. Fluid retention.
4. Premature closure of the ductus arteriosus in the fetus.
5. Renal failure in a patient with poor renal function.

Indomethacin is also a useful drug to use if there is a contra-indication to giving a beta2 stimulant, e.g. maternal tachycardia due to pyrexia. The risk of fetal death due to closure of the ductus arteriosus by indomethacin is much greater after 31 weeks. Therefore, indomethacin should not be used from 32 weeks gestation.

Successful suppression of preterm labour with nifedipine (Adalat) or hexoprenaline together with indomethacin is more likely if antibiotics (ampicillin and metronidazole) are given in addition. Possible asymptomatic chorioamnionitis will then be treated as well.

5-29 HOW SHOULD YOU MANAGE THE PATIENT FURTHER, AFTER LABOUR HAS BEEN SUCCESSFULLY SUPPRESSED?

1. If there is a treatable cause, e.g. a urinary tract infection, then no further suppression of labour is necessary after the cause has been treated.
2. If nothing can be done about the cause of the preterm labour, e.g. in the case of a multiple pregnancy or polyhydramnios, nifedipine (Adalat) 20 mg orally may be given as soon as the hexoprenaline infusion is being decreased. The dose is repeated 8 hourly.

5-30 WHAT OTHER ACTION CAN BE TAKEN TO IMPROVE THE FETAL OUTCOME?

1. Steroids administered parenterally to the mother cross the placenta and hasten the onset of fetal lung maturity. Betamethasone (Celestone-Soluspan) 12 mg (2 ml) intramuscularly is the drug of choice.
2. Two doses of 12 mg each are given 24 hours apart. Fetal lung maturity is usually, but not always, achieved 24 hours after the second dose. Suppression of labour for 48 hours in order to give betamethasone is, therefore, of value.
3. If the infant is not delivered and there is still a risk of preterm delivery, a single dose of 12 mg can be given after a week. The dose should not be repeated weekly until a gestational age of 33 weeks is reached.

**** Fetuses that are exposed to repeated doses of steroids in pregnancy are born with a smaller head circumference and length. As the long term neurological outcome is uncertain, the maximum dose described here should not be exceeded.*

5-31 WHAT ARE THE DANGERS OF USING STEROIDS TO PROMOTE FETAL LUNG MATURITY?

1. Steroids must not be given if a clinically detectable infection is the cause of the preterm labour, because they may make the infection worse.
2. Steroids cause fluid retention. Consequently, the amount of intravenous fluid which is used to administer the hexoprenaline must be restricted.
3. The patient must continually be observed for signs of fluid overload, the first sign of which is the presence of crepitations in the lungs, as a result of pulmonary oedema.

5-32 IF THE DELIVERY OF A PRETERM INFANT CANNOT BE PREVENTED, WHAT ACTION SHOULD YOU TAKE IN ORDER TO MAKE THE DELIVERY AS SAFE AS POSSIBLE?

1. The mother must be transferred before delivery to a hospital where preterm infants can be managed.
2. Entonox (50% nitrous oxide and 50% oxygen) or an epidural anaesthetic are the preferred methods of providing analgesia.
3. The membranes should not be ruptured as they form a better cervical dilator than the small fetal head. If they rupture spontaneously, a sterile vaginal examination must be done to exclude an umbilical cord prolapse.
4. A spontaneous vertex delivery, with an episiotomy if necessary, is the best method of delivery. A well-controlled delivery of the fetal head reduces the risk of intracranial haemorrhage. There is no evidence that the routine use of forceps has any advantage for the preterm infant.
5. Before the delivery, you must make sure that the equipment you need for the resuscitation and management of the preterm infant is available and in working order.

MANAGEMENT OF PRETERM RUPTURE OF THE MEMBRANES**5-33 HOW SHOULD YOU MANAGE PRETERM RUPTURE OF THE MEMBRANES?**

There are two possible ways of managing preterm rupture of the membranes:

1. Labour can be induced.
2. The pregnancy can be allowed to continue.

The management of a patient with preterm rupture of the membranes is summarised in flow diagram 5-II.

5-34 HOW SHOULD YOU DECIDE WHICH METHOD OF MANAGEMENT TO USE?

The danger of prematurity, if the fetus is delivered, must be weighed against the risk of infection in both the mother and the fetus, if the pregnancy is allowed to continue.

5-35 WHAT IS THE REASON FOR ALLOWING PREGNANCY TO CONTINUE WITH PRETERM RUPTURE OF THE MEMBRANES?

To provide time for the fetal lungs to mature and, thereby, to reduce the danger of hyaline membrane disease after delivery.

PREMATURITY REMAINS THE COMMONEST CAUSE OF NEONATAL DEATH RESULTING FROM PRETERM RUPTURE OF THE MEMBRANES

5-36 WHICH PATIENTS WITH PRETERM RUPTURE OF THE MEMBRANES ARE AT AN INCREASED RISK OF CHORIOAMNIONITIS?

Patients with preterm rupture of the membranes plus one or more of the following factors are at a particularly high risk of chorioamnionitis:

1. HIV positive patients with immune suppression, either:
 - (i) A CD4 count of less than 200 cells/mm³.
 - (ii) An AIDS defining infection that indicates clinical immune suppression.
2. Rupture of the membranes during or following coitus.
3. A digital vaginal examination following rupture of the membranes.
4. No antenatal care.

5-37 WHAT SHOULD YOU DO ONCE PRETERM RUPTURE OF THE MEMBRANES HAS OCCURRED?

1. Check whether the fetus is still alive, and exclude fetal distress by assessing fetal movements. Antenatal fetal heart rate monitoring is of great value.
2. Determine the duration of pregnancy as accurately as possible. Remember, with preterm rupture of the membranes, both clinical and ultrasound examinations tend to underestimate the duration of pregnancy.
3. Look for signs of clinical chorioamnionitis.

If the history and clinical examination indicate a pregnancy of less than 34 weeks duration, an ultrasound examination is of value in determining fetal size and possible gross congenital abnormalities.

5-38 WHAT ARE THE INDICATIONS FOR INDUCTION OF LABOUR WHEN PRETERM RUPTURE OF THE MEMBRANES HAS OCCURRED?

1. An HIV positive patient as described in 5-36.
2. A duration of pregnancy of 34 weeks or more.
3. A duration of pregnancy less than 26 weeks.
4. Intra-uterine death or severe fetal congenital abnormalities.
5. Signs of clinical chorioamnionitis.
6. Maternal illness such as pre-eclampsia or diabetes mellitus.
7. Severe intra-uterine growth retardation.
8. Antepartum haemorrhage of unknown cause.

5-39 WHAT METHOD OF INDUCTION SHOULD YOU USE?

The method of choice is to stimulate uterine contractions with oxytocin. If there are contra-indications to stimulating labour or to a vaginal delivery, then a caesarean section is done.

5-40 WHAT SHOULD THE DAILY CARE OF A PATIENT INCLUDE IF PREGNANCY IS ALLOWED TO CONTINUE?

1. The patient must be kept at bed rest, being allowed up to the toilet. She must not sit in a bath, but should use a shower.
2. Digital vaginal examinations must NOT be done.
3. The condition of the fetus must be monitored daily, preferably with a cardiotocograph. If this is not available, fetal movements are counted and recorded.
4. Observations for signs of clinical chorioamnionitis must be done:
 - (i) The maternal pulse rate and temperature and the fetal heart rate are checked 4 hourly.
 - (ii) An abdominal examination is done twice a day to check for uterine tenderness.
 - (iii) At the same time it is noted whether or not the liquor is offensive.

THE FIRST DIGITAL VAGINAL EXAMINATION IN A PATIENT WITH PRETERM RUPTURE OF THE MEMBRANES IS DONE ONLY WHEN SHE IS IN ESTABLISHED LABOUR**5-41 HOW LONG SHOULD YOU ALLOW PREGNANCY TO CONTINUE?**

1. If complications, such as chorioamnionitis and fetal distress, do not develop, pregnancy is allowed to continue until the patient goes into labour. However, if the pregnancy reaches 34 weeks duration and the patient is still draining liquor, an oxytocin induction is done.
2. A patient who has stopped draining liquor completely and where liquor is present on abdominal examination, with no signs of chorioamnionitis, may be allowed to continue her pregnancy until the spontaneous onset of labour. The patient may be allowed home if no liquor has drained for 2 days. However, she is not allowed to sit in a bath or to have coitus. The patient must be followed weekly at a high risk clinic.

**** The administration of steroids will promote fetal lung maturity if patients with preterm rupture of the membranes are managed conservatively. Betamethasone (Celestone Soluspan) 12 mg (2 ml) is given intramuscularly. The dose is repeated after 24 hours. Because steroids may increase the risk of infection, ampicillin and metronidazole (Flagyl) must also be prescribed, as in the case where preterm labour is being suppressed. If a patient, who is being managed in this way, should develop contractions before 24 hours have passed after giving steroids, and there are no clinical signs of chorioamnionitis or any other contraindications to the suppression of preterm labour, the labour must be suppressed with nifedipine (Adalat) or hexoprenaline (Ipradol). An attempt is thus made to expose the fetal lungs to steroids for at least 24 hours.*

5-42 WHICH PHYSICAL SIGNS WILL BE PRESENT IF A PATIENT DEVELOPS SEVERE INFECTION (SEPTIC SHOCK) AND WHAT WILL THE INITIAL MANAGEMENT BE?

1. The signs of clinical chorioamnionitis already mentioned will be present. In addition, there will be a drop in the blood pressure and cold clammy extremities, if severe infection (septic shock) develops.
2. The patient must be actively resuscitated and treated with ampicillin, metronidazole (Flagyl) and gentamicin. The patient must then be referred to a level 2 or 3 hospital.

5-43 WHAT ADVICE SHOULD YOU GIVE TO A WOMAN WHO HAS DELIVERED A PRETERM INFANT?

1. She should be seen before her next pregnancy to be assessed for possible causes, e.g. cervical incompetence.
2. She must book early in any future pregnancy.

PRELABOUR RUPTURE OF THE MEMBRANES

5-44 HOW SHOULD YOU MANAGE A PATIENT WITH PRELABOUR RUPTURE OF THE MEMBRANES?

1. If a patient has prelabour ruptured membranes and there are signs of chorioamnionitis, then labour should be induced without delay.
2. HIV positive patients should be started on a course of antibiotics and labour should be induced:
 - (i) The longer the interval between rupture of the membranes and delivery, the greater is the risk of mother to child transmission of HIV.
 - (ii) The patient has a higher risk of chorioamnionitis.
3. However, if the patient is at low risk of chorioamnionitis and both fetal and maternal conditions are good, you can wait for 24 hours after the membranes have ruptured before inducing labour. About 80% of patients will go into labour spontaneously within this period. A digital vaginal examination should not be done until the patient is in labour.

**** In busy hospitals with a high bed occupancy rate, patients with prelabour rupture of the membranes can have their labour induced with oxytocin after the diagnosis is confirmed. Induction of labour in these circumstances does not result in a higher caesarean section rate but reduces hospital stay by 24 hours.*

CASE PROBLEMS

CASE 1

A patient, 32 weeks pregnant, presents with regular painful uterine contractions. She is afebrile and appears clinically well. On vaginal examination, the cervix is 4 cm dilated. The fetal heart rate is 138 beats per minute with no decelerations.

1. Is the patient in true or false labour? Give the reasons for your diagnosis.

She is in true labour because she is getting regular painful contractions and her cervix is 4 cm dilated.

2. What signs exclude a diagnosis of clinical chorioamnionitis?

The patient is afebrile, clinically well and has a normal fetal heart rate.

3. Why could chorioamnionitis still be the cause of her preterm labour?

Because chorioamnionitis is often asymptomatic.

4. Would you allow labour to continue or would you suppress labour?

Labour should be suppressed because the pregnancy is of less than 34 weeks duration, the fetus is viable, and there are no signs of clinical chorioamnionitis or fetal distress.

5. How should labour be suppressed?

Labour must be suppressed using nifedipine (Adalat) or hexoprenaline (Ipradol).

6. Which other drugs would increase the chance of successful suppression of preterm labour?

Antibiotics, such as ampicillin and metronidazole (Flagyl), increase the likelihood of successful suppression of preterm labour if the labour is caused by asymptomatic chorioamnionitis.

7. Must indomethacin (Indocid) also be given?

No, as the patient is already 32 weeks pregnant. The risk of closing the ductus arteriosus and causing intra-uterine deaths increases from 32 weeks.

8. What drugs can be used to hasten fetal lung maturity and would you give one of these drugs to this patient?

Steroids, such as betamethasone, can be given to the patient to hasten lung maturity in the fetus. As this patient's pregnancy is less than 34 weeks and there are no signs of clinical chorioamnionitis, steroids must be given.

CASE 2

A patient, who is 36 weeks pregnant, reports that she has been draining liquor since earlier that day. The patient appears well, with normal observations, no uterine contractions and the fetal heart rate is normal.

1. Would you diagnose rupture of the membranes on the history given by the patient?

No, other causes of fluid draining from the vagina may cause confusion, e.g. a vaginitis or stress incontinence.

2. How would you confirm rupture of the membranes?

A sterile speculum examination should be done. If there is no clear evidence of liquor draining, the pH and ferning tests can be used to identify liquor.

3. Why should you not perform a digital vaginal examination to assess whether the cervix is dilated or effaced?

A digital vaginal examination is contra-indicated in the presence of rupture of the membranes if the patient is not already in labour, because of the risk of introducing infection.

4. Is this patient at high risk of having or developing chorioamnionitis?

Yes. The preterm prelabour rupture of the membranes may have been caused by chorioamnionitis. In addition, all patients with ruptured membranes are at an increased risk of developing chorioamnionitis.

5. Should you induce labour? Give your reasons.

Yes. As she is more than 34 weeks pregnant, one should induce labour. As the patient does not fall into a high risk group for infection, a waiting period of 24 hours from the time of rupture can be allowed, before inducing labour. Most patients will go into labour spontaneously during this period.

6. Should you prescribe antibiotics? Give your reasons.

There is no indication for giving antibiotics as there are no signs of clinical chorioamnionitis. However, a careful watch must be kept for early signs of maternal infection or fetal tachycardia.

CASE 3

An unbooked patient presents with a 5 day history of ruptured membranes. She is pyrexial with lower abdominal tenderness and is draining offensive liquor. She is uncertain of her dates but abdominal examination suggests that she is at term. Treatment has been started with oral ampicillin.

1. What signs of clinical chorioamnionitis does the patient have?

She is pyrexial, with lower abdominal tenderness and she has offensive liquor.

2. Would you induce labour in this patient? Give your reasons.

Yes, because there is danger of spreading infection in both the mother and fetus if the infant is not delivered. The patient is in grave danger of developing septic shock. Labour should be induced with oxytocin, if there is no indication for an immediate delivery, e.g. fetal distress. With signs of septic shock, the patient must be actively resuscitated and treated with broad spectrum antibiotics, followed by delivery of the fetus. The earliest sign of septic shock will be a fall in the blood pressure, followed by the patient developing cold, clammy extremities.

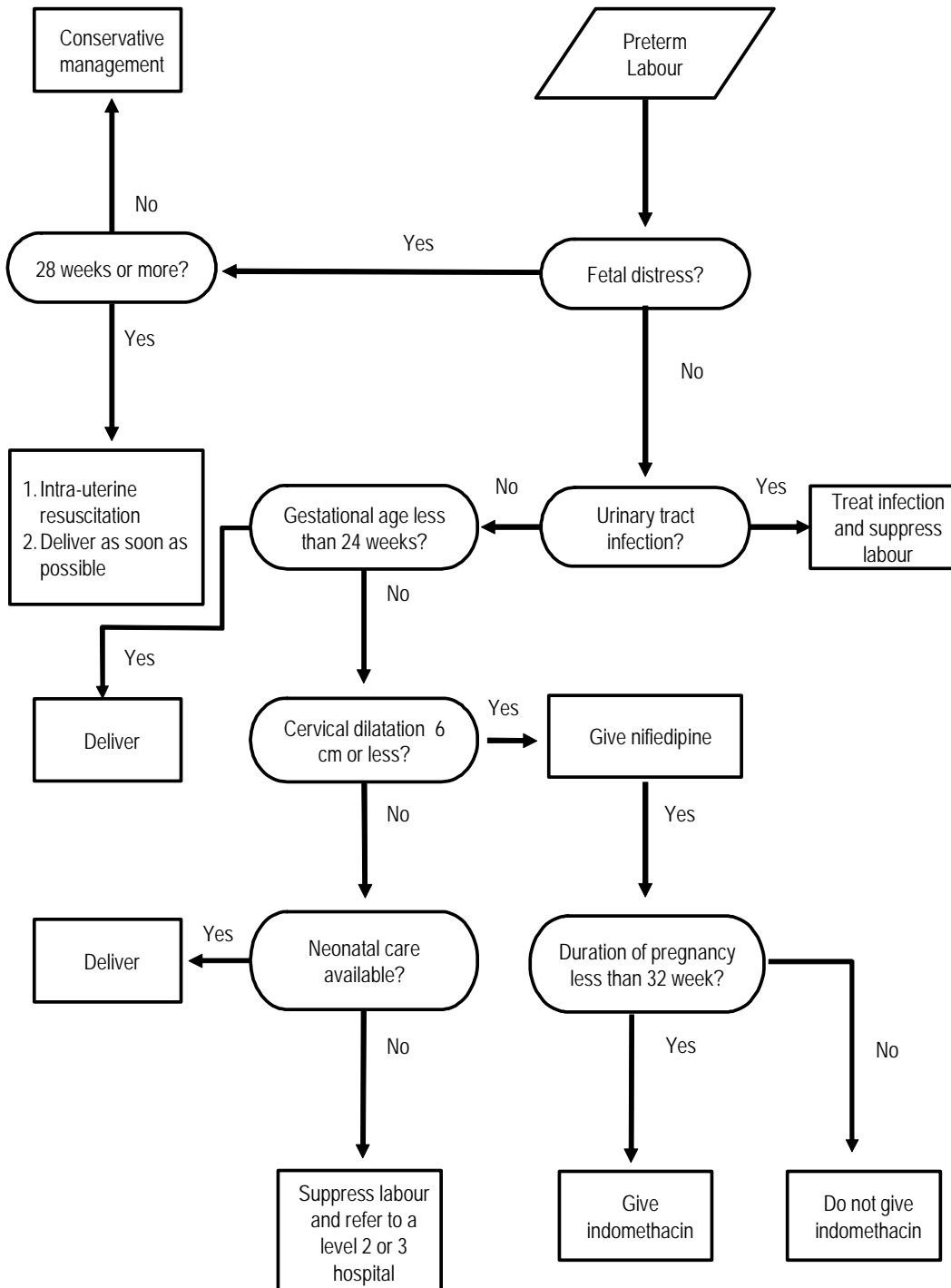
3. Should you continue to treat the patient with oral ampicillin? Give your reasons.

She should be treated with appropriate broad spectrum antibiotics, given in adequate dosages until her pyrexia has subsided. As it is not clear how long the infection has been present, gentamicin must be added to the ampicillin and metronidazole (Flagyl) until the patient has been afebrile for 24 hours. The gentamicin and ampicillin must initially be given intravenously and the metronidazole as a rectal suppository.

4. Why is the infant at increased risk for neonatal complications?

The chorioamnionitis has already spread to the liquor as this is offensive. Therefore, the fetus may also be infected and may present with congenital pneumonia or septicaemia at birth.

Flow diagram 5-I. The management of a patient with preterm labour when the duration pregnancy is less than 34 weeks.



Flow diagram 5-II. The management of a patient with preterm prelabour rupture of the membranes.

