

PERINATAL EDUCATION PROGRAMME

THE HYPERTENSIVE DISORDERS OF PREGNANCY

UNIT 3

OBJECTIVES

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

1. Define hypertension in pregnancy.
2. Give a simple classification of the hypertensive disorders of pregnancy.
3. Diagnose pre-eclampsia and chronic hypertension.
4. Explain why the hypertensive disorders of pregnancy must always be regarded as serious.
5. List which patients are at risk of developing pre-eclampsia.
6. List the complications of pre-eclampsia.
7. Differentiate pre-eclampsia from severe pre-eclampsia.
8. Give a practical guide to the management of pre-eclampsia.
9. Manage eclampsia.
10. Manage gestational hypertension and chronic hypertension during pregnancy.

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3-1 WHAT IS THE NORMAL BLOOD PRESSURE DURING PREGNANCY?

The normal systolic blood pressure is less than 140 mm Hg and the diastolic blood pressure is less than 90 mm Hg. During the second trimester both the systolic and diastolic blood pressures usually fall and then rise again toward the end of pregnancy. A mild rise in blood pressure early in the third trimester can, therefore, be normal.

The correct method of measuring blood pressure is demonstrated in skills workshop 3 of this PEP manual.

3-2 WHAT IS HYPERTENSION DURING PREGNANCY?

Hypertension during pregnancy is defined as a diastolic blood pressure of 90 mm Hg or more.

A DIASTOLIC BLOOD PRESSURE OF 90 MM HG OR MORE DURING PREGNANCY IS ABNORMAL

During pregnancy an abnormally high blood pressure is often accompanied by proteinuria.

3-3 WHAT IS PROTEINURIA?

Proteinuria is defined as an excessive amount of protein in the urine. Normally the urine contains no protein or only a trace of protein. Therefore, a trace of protein in the urine is not regarded as abnormal.

Proteinuria during pregnancy is diagnosed when either of the following is present:

1. 0,3 g or more of protein in a 24 hour urine specimen.
2. 1+ or more protein as measured with a reagent strip (e.g. Albustix, Labstix, Uristix, Multistix, Lenstrip, etc).

Proteinuria during pregnancy may also be caused by:

1. A urinary tract infection or by renal disease.
2. Contamination of the urine by a vaginal discharge or leucorrhoea.

Patients with proteinuria must be asked to collect a second sample, as a midstream specimen of urine (MSU). The correct method of collecting an MSU must be carefully explained to the patient. The amount of proteinuria present in the MSU will be the correct one and must, therefore, be recorded in the notes. The further management will be dictated by the amount of proteinuria in the MSU.

1 + OR MORE PROTEIN IN THE URINE IS ABNORMAL

THE CLASSIFICATION OF HYPERTENSION DURING PREGNANCY**3-4 HOW IS HYPERTENSION DURING PREGNANCY CLASSIFIED?**

The classification of hypertension during pregnancy depends on:

1. Whether the hypertension started before or after the 20th week of pregnancy.
2. Whether or not proteinuria is also present.

THE CLASSIFICATION OF HYPERTENSION DURING PREGNANCY DEPENDS ON THE TIME OF ONSET OF THE HYPERTENSION AND THE PRESENCE OR ABSENCE OF PROTEINURIA

Classifying hypertension is important as the cause of the hypertension and the risk to the mother and fetus vary between the different groups.

The common forms of hypertension during pregnancy that will be discussed in this unit are:

1. Pre-eclampsia (gestational proteinuric hypertension).
2. Gestational hypertension.
3. Chronic hypertension.
4. Chronic hypertension with superimposed pre-eclampsia.
5. Eclampsia.

*** Based on the above criteria, hypertension during pregnancy is at present divided into the following conditions:

1. Gestational proteinuric hypertension (or pre-eclampsia).
2. Gestational hypertension.
3. Chronic hypertension and chronic renal disease with hypertension.
4. Chronic hypertension with superimposed gestational proteinuric hypertension (or pre-eclampsia).
5. Unclassified hypertension and unclassified proteinuric hypertension (if the patient is seen for the first time in the second half of pregnancy, with hypertension and/or proteinuria).
6. Eclampsia.

3-5 WHAT IS PRE-ECLAMPSIA?

Pre-eclampsia (or gestational proteinuric hypertension) presents with hypertension and proteinuria which develop in the second half of pregnancy. Pre-eclampsia may present during pregnancy, labour or the puerperium.

3-6 WHAT IS GESTATIONAL HYPERTENSION?

In contrast to pre-eclampsia, gestational hypertension is not accompanied by proteinuria but also presents in the second half of pregnancy. Should proteinuria develop in a patient with gestational hypertension, the diagnosis must be changed to pre-eclampsia.

PRE-ECLAMPSIA PRESENTS WITH HYPERTENSION AND PROTEINURIA IN THE SECOND HALF OF PREGNANCY

*** The term *pre-eclampsia* (rather than *gestational proteinuric hypertension*) will be used as it is still widely known as such.

3-7 WHAT IS CHRONIC HYPERTENSION?

Chronic hypertension is hypertension, with or without proteinuria, that presents during the first half of pregnancy. There is usually a history of hypertension before the start of the pregnancy.

*** *Chronic hypertension without proteinuria is usually due to essential hypertension. If the chronic hypertension is accompanied by proteinuria during the first half of pregnancy, then the hypertension is usually due to chronic renal disease.*

3-8 WHAT IS CHRONIC HYPERTENSION WITH SUPERIMPOSED PRE-ECLAMPSIA?

This is hypertension presenting during the first half of pregnancy that is complicated by the appearance of proteinuria during the second half of pregnancy. In other words it is chronic hypertension that is complicated by the development of pre-eclampsia.

*** *Patients who book in the second half of pregnancy cannot be classified into any of the above types of hypertension as it is not known whether the hypertension started in the first or second half of pregnancy. If a patient has hypertension without proteinuria when she books during the second half of pregnancy, she is said to have unclassified hypertension. However, if she has both hypertension and proteinuria when she books during the second half of pregnancy, she is said to have unclassified proteinuric hypertension. Most patients with unclassified hypertension probably have chronic hypertension, while most patients with unclassified proteinuric hypertension probably have pre-eclampsia.*

3-9 WHAT IS ECLAMPSIA?

Eclampsia is a serious complication of pre-eclampsia that presents with convulsions during pregnancy, labour or the first 7 days of the puerperium. Convulsions can also be the result of other causes e.g. epilepsy, but the possibility of eclampsia must be carefully ruled out whenever convulsions occur.

PRE-ECLAMPSIA

Pregnancy induced proteinuric hypertension and chronic hypertension with superimposed pre-eclampsia will subsequently be discussed under the heading "pre-eclampsia" because the management is similar, regardless of the classification. Pre-eclampsia is the hypertensive disorder of pregnancy which occurs most commonly and also causes most problems for the mother and fetus.

3-10 HOW FREQUENTLY DOES PRE-ECLAMPSIA OCCUR?

In the Western Cape 5-6% of all pregnant women develop pre-eclampsia.

3-11 IS PRE-ECLAMPSIA A DANGER TO THE MOTHER?

Yes, it is one of the most important causes of maternal death in most parts of Southern Africa.

3-12 WHAT ARE THE MATERNAL COMPLICATIONS OF PRE-ECLAMPSIA?

The most important complications of pre-eclampsia are also important causes of maternal death during pregnancy:

1. Intracerebral haemorrhage.
2. Eclampsia.

**** Other, less common, complications of pre-eclampsia are pulmonary oedema and the HELLP (Haemolysis, Elevated Liver enzymes, and a Low Platelet count) syndrome. Rupture of the liver, renal failure, the adult respiratory distress syndrome and a generalized disorder of blood coagulation may also occur, but fortunately, those are rare complications.*

3-13 WHICH PATIENTS ARE AT AN INCREASED RISK OF INTRACEREBRAL HAEMORRHAGE?

The risk of intracerebral haemorrhage is especially high if the diastolic blood pressure is 110 mm Hg or more.

3-14 DOES ECLAMPSIA ONLY OCCUR AT A VERY HIGH DIASTOLIC BLOOD PRESSURE?

No, eclampsia can occur at a much lower blood pressure, especially in young patients.

3-15 WHY IS PRE-ECLAMPSIA A DANGER TO THE FETUS AND NEWBORN INFANT?

Pre-eclampsia is an important cause of perinatal death because:

1. Preterm delivery is often necessary because of a deterioration in the maternal condition or the development of fetal distress.
2. Abruptio placentae is more common in patients with pre-eclampsia.
3. Pre-eclampsia is associated with decreased placental blood flow. As a result of decreased placental blood flow the fetus may suffer from:
 - (i) Intra-uterine growth restriction or wasting.
 - (ii) Fetal distress.

PRE-ECLAMPSIA MAY RESULT IN INTRA-UTERINE GROWTH RESTRICTION, FETAL DISTRESS, PRETERM DELIVERY AND INTRA-UTERINE DEATH

3-16 HOW CAN THE SEVERITY OF PRE-ECLAMPSIA BE GRADED?

The severity of pre-eclampsia can be graded by:

1. The diastolic blood pressure.
2. The amount of proteinuria.
3. Signs and symptoms of imminent eclampsia.
4. The presence of convulsions.

Patients with pre-eclampsia can be divided into 4 grades of severity:

1. **PRE-ECLAMPSIA:**

A diastolic blood pressure of 90 - 109 mm Hg and proteinuria.

2. **SEVERE PRE-ECLAMPSIA:**

A diastolic blood pressure of 110 mm Hg or more on 2 occasions, 4 hours apart, or 120 mm Hg or more on 1 occasion, and proteinuria.

3. **IMMINENT ECLAMPSIA:**

These patients have symptoms and/or signs that indicate that they are at extremely high risk of developing eclampsia at any moment. The diagnosis does NOT depend on the degree of hypertension or the amount of proteinuria present.

4. **ECLAMPSIA:**

Eclampsia is diagnosed when a patient with any of the grades of pre-eclampsia has a convulsion.

IF THERE IS ANY DOUBT ABOUT THE GRADE OF PRE-ECLAMPSIA, THE PATIENT SHOULD ALWAYS BE PLACED IN THE MORE SEVERE GRADE

Patients who improve on bed rest should be kept in the grade of pre-eclampsia which they were given at the initial evaluation on admission. Further management should be in accordance with this grade.

3-17 WHAT ARE THE SYMPTOMS AND SIGNS OF IMMINENT ECLAMPSIA?

The SYMPTOMS are:

1. Headache.
2. Visual disturbances or flashes of light seen in front of the eyes.
3. Upper abdominal pain, in the epigastrium and/or over the liver.

The SIGNS are:

1. Tenderness over the liver.
2. Increased tendon reflexes, e.g. knee reflexes.

THE DIAGNOSIS OF IMMINENT ECLAMPSIA IS MADE EVEN IF ONLY ONE OF THE SYMPTOMS OR SIGNS IS PRESENT, IRRESPECTIVE OF THE BLOOD PRESSURE OR THE AMOUNT OF PROTEINURIA

3-18 HOW COMMON IS ECLAMPSIA?

In the Western Cape the incidence of eclampsia is 1 per 1000 pregnancies.

PATIENTS AT INCREASED RISK OF PRE-ECLAMPSIA

3-19 WHICH PATIENTS ARE AT AN INCREASED RISK OF PRE-ECLAMPSIA?

1. Primigravidas.
2. Patients with chronic hypertension.
3. Patients over 34 years.
4. Patients with a multiple pregnancy.
5. Diabetics.
6. Patients with a past history of a pregnancy complicated by pre-eclampsia, especially if the pre-eclampsia developed during the late 2nd or early 3rd trimester.
7. Patients who develop generalized oedema, especially facial oedema.

3-20 WHAT ADVICE SHOULD BE GIVEN TO PATIENTS AT INCREASED RISK OF PRE-ECLAMPSIA?

They must be told about the symptoms of imminent eclampsia, and advised to contact the clinic or hospital immediately, if these symptoms appear.

3-21 WHAT SPECIAL CARE SHOULD BE GIVEN TO PATIENTS AT INCREASED RISK OF PRE-ECLAMPSIA?

In the second half of pregnancy, the following must be carefully watched for:

1. A rise in diastolic blood pressure.
2. Proteinuria.
3. Symptoms and signs of imminent eclampsia.

Patients with an obstetric history of pre-eclampsia that developed late in the second or early in the third trimester, must receive 75 mg aspirin (a quarter Disprin) daily from a gestational age of 14 weeks. This will reduce the risk that pre-eclampsia may develop.

3-22 WHAT SHOULD YOU DO IF A PATIENT DEVELOPS GENERALIZED OEDEMA, BUT REMAINS NORMOTENSIVE AND DOES NOT HAVE PROTEINURIA?

1. She should rest as much as possible.
2. She should be followed up weekly at the antenatal clinic and carefully checked for the development of hypertension and proteinuria.
3. She should carefully monitor the fetal movements.

THE MANAGEMENT OF PRE-ECLAMPSIA

3-23 WHAT SHOULD YOU DO IF A PATIENT DEVELOPS PRE-ECLAMPSIA?

1. A patient with pre-eclampsia must be admitted to hospital. Such a patient may safely be cared for in a level 1 hospital.
2. Methyldopa (Aldomet) must be prescribed to control the blood pressure.

*** High doses of methyldopa (Aldomet), e.g. 500 mg 8 hourly, must be given.

ALL PATIENTS WITH PRE-ECLAMPSIA MUST BE ADMITTED TO HOSPITAL, IRRESPECTIVE OF THE LEVEL OF THE BLOOD PRESSURE

3-24 HOW SHOULD YOU MONITOR THE FETUS, TO ENSURE FETAL WELL BEING?

Patients with pre-eclampsia often have placental insufficiency, associated with intra-uterine growth retardation. Fetal distress, therefore, occurs commonly. If this is not diagnosed, and the fetus delivered soon, intra-uterine death will result. These patients are also at high risk of abruptio placentae, followed by fetal distress and frequently also intra-uterine death. The fetal condition must, therefore, be carefully monitored in all patients with pre-eclampsia.

Twice daily fetal movements must be counted and recorded by the patient.

**** In level 2 and 3 hospitals antenatal fetal heart rate monitoring (CTG) for fetal distress must be done at least daily.*

PATIENTS WITH PRE-ECLAMPSIA ARE AT HIGH RISK OF DEVELOPING FETAL DISTRESS. THEY MUST, THEREFORE, BE CAREFULLY MONITORED FOR FETAL DISTRESS

3-25 WHEN SHOULD YOU DELIVER A PATIENT WITH PRE-ECLAMPSIA?

Patients who have a gestational age of 36 weeks or more should have their labour induced on the day that the diagnosis is made. If the patient has a favourable ("ripe") cervix, a surgical induction can be done.

A patient with an unfavourable ("unripe") cervix must be referred to a level 2 hospital. There, labour is induced by first "ripening" the cervix with a very low dose of oral misoprostol (Cytotec) or prostaglandin E₂, after which the membranes are ruptured. A patient must always be carefully monitored for an hour after oral misoprostol or the insertion of the prostaglandin, because overstimulation of the uterus may cause fetal distress.

Patients with a gestation of less than 36 weeks must be managed as described in sections 3-23 and 3-24.

3-26 WHAT SHOULD YOU DO IF A PATIENT WITH PRE-ECLAMPSIA DEVELOPS SEVERE PRE-ECLAMPSIA?

1. If the patient is 34 weeks' pregnant or more, labour must be induced.
2. If she is less than 34 weeks' pregnant, she must be managed as indicated under 3-37.

THE MANAGEMENT OF PRE-ECLAMPSIA IS BEDREST AND CAREFUL MONITORING, TO DETECT A WORSENING OF THE PRE-ECLAMPSIA OR THE DEVELOPMENT OF FETAL DISTRESS

3-27 WHAT SPECIAL INVESTIGATIONS ARE INDICATED IN PRE-ECLAMPSIA?

1. An MSU must be examined microscopically for a urinary tract infection, or sent to the laboratory for culture, as a urinary tract infection may be responsible for the proteinuria.
2. A platelet count must be done, if a laboratory is available. A platelet count of less than 100 000 is an indication for referral of the patient to a level 2 hospital.

A URINARY TRACT INFECTION MUST BE EXCLUDED IN ALL PATIENTS WITH PROTEINURIA IN PREGNANCY

THE EMERGENCY MANAGEMENT OF SEVERE PRE-ECLAMPSIA AND IMMINENT ECLAMPSIA

The management of patients with severe pre-eclampsia and imminent eclampsia is the same and consists of stabilizing the patient, followed by referral to a level 2 or 3 hospital.

3-28 WHAT ARE THE GREATEST DANGERS TO THE PATIENT WITH SEVERE PRE-ECLAMPSIA?

The two greatest dangers, which are a threat to the patient's life, are eclampsia and an intracerebral haemorrhage.

3-29 HOW SHOULD YOU MANAGE A PATIENT WITH SEVERE PRE-ECLAMPSIA OR IMMINENT ECLAMPSIA?

The main aims of management are to:

1. Prevent eclampsia, by giving magnesium sulphate.
2. Prevent intracerebral haemorrhage, by decreasing the blood pressure with parenteral dihydralazine (Nepresol) or oral nifedipine capsules (Adalat).

THE INITIAL MANAGEMENT OF SEVERE PRE-ECLAMPSIA AND IMMINENT ECLAMPSIA IS AIMED AT THE PREVENTION OF ECLAMPSIA AND INTRACEREBRAL HAEMORRHAGE

The steps in the management of severe pre-eclampsia are:

STEP 1.

An intravenous infusion is started (Plasmalyte B or Ringer's lactate) and magnesium sulphate is administered as follows :

- (i) Give 4 g slowly intravenously over 10 minutes. Prepare the 4 g by adding 8 ml 50% magnesium sulphate (i.e. 2 ampoules) to 12 ml sterile water.
- (ii) Then give 5 g (i.e. 10 ml 50% magnesium sulphate) by deep intramuscular injection into each buttock.

A total of 14 g of magnesium sulphate is, therefore, given.

**** 300 ml of the intravenous infusion is given rapidly over half an hour. Thereafter, the infusion is given slowly, at a rate of 80 ml per hour.*

STEP 2.

After the magnesium sulphate has been administered, a Foley's catheter is inserted into the patient's bladder, to monitor the urinary output.

STEP 3.

After giving the magnesium sulphate the blood pressure must be measured again. If the diastolic blood pressure is still 110 mg Hg or higher, dihydralazine (Nepresol) or oral nifedipine (Adalat) is given as follows:

- (i) Give 6,25 mg dihydralazine by intramuscular injection or 10 mg (one capsule) nifedipine orally.
- (ii) The patient's blood pressure is taken every 5 minutes for the next 30 minutes. If the blood pressure drops too much, intravenous Plasmalyte B or Ringer's lactate is administered rapidly, until the blood pressure returns to normal.

**** An ampoule of dihydralazine (25 mg) may also be mixed with 20 ml of sterile water. Bolus doses of 2 ml (2,5 mg) are then given slowly intravenously, at 20 minute intervals, until the diastolic blood pressure drops below 110 mm Hg. Patients who have received 10 mg nifedipine, can be given a second dose of 10 mg nifedipine orally if the diastolic blood pressure remains 110 mm HG after 30 minutes. If necessary, it can be repeated half hourly up to a maximum dose of 50 mg.*

STEP 4.

When the blood pressure is controlled, the patient is transferred to a level 2 or 3 hospital.

PATIENTS WITH SEVERE PRE-ECLAMPSIA OR IMMINENT ECLAMPSIA MUST ALWAYS BE STABILIZED BEFORE THEY ARE TRANSFERRED, OR FURTHER MANAGEMENT IS DECIDED UPON

Nifedipine 10 mg capsules must always be given orally in pregnancy and NOT GIVEN SUBLINGUALLY (under the tongue). The 10 mg capsules must not be confused with Adalat XL tablets which are slowly dissolved and not suitable for rapidly lowering the blood pressure.

3-30 WHAT CAN BE DONE TO ENSURE MAXIMAL SAFETY FOR THE PATIENT DURING HER TRANSFER TO HOSPITAL?

1. A doctor or registered nurse/midwife should accompany the patient.
2. Resuscitation equipment, together with magnesium sulphate, calcium gluconate and dihydralazine or nifedipine, must be available in the ambulance.
3. Convulsions must be watched for and the patient's blood pressure must also be carefully observed.
4. If the patient begins to convulse in the ambulance, she must be given a further 2 g of magnesium sulphate intravenously. The dose may, if required, be repeated once. (Make up the solution beforehand and keep it ready in a 20 ml syringe). Further maintenance doses of magnesium sulphate must be given if more than 4 hours pass after the loading dose.
5. If the blood pressure again rises to 110 mm Hg or more while the patient is being transported, you should give a second dose of 6,25 mg dihydralazine intramuscularly or 10 mg nifedipine by mouth. Remember that, with every administration of dihydralazine, there is a danger that the patient may become hypotensive. Another side-effect is tachycardia, and if the pulse rate rises to 120 beats per minute or above, further administration of dihydralazine must be stopped.

3-31 HOW AND WHEN SHOULD YOU GIVE MAINTENANCE DOSES OF MAGNESIUM SULPHATE?

After the initial loading dose of magnesium sulphate, the patient will need regular maintenance doses until 24 hours after delivery. Magnesium sulphate 5 g is given 4 hourly by deep intramuscular injection into alternate buttocks. The injections are less painful if the magnesium sulphate is injected together with 1 ml 1% lignocaine.

3-32 WHAT ARE THE ADVERSE EFFECTS OF AN OVERDOSE OF MAGNESIUM SULPHATE AND HOW CAN THEY BE PREVENTED?

An overdose of magnesium sulphate causes respiratory and cardiac depression. Here, the patellar reflex acts as a convenient warning. If the reflex is present, the drug may safely be given, as there is no danger of overdosage. If the reflexes are absent or very reduced, there is a danger of overdosage and the next dose must not be given.

Magnesium sulphate is excreted by the kidneys. If the urinary output is less than 30 ml per hour, follow-up doses must only be given if there is a definite patellar reflex present.

3-33 WHAT SHOULD YOU DO IF THE PATIENT DEVELOPS THE EFFECTS OF AN OVERDOSE OF MAGNESIUM SULPHATE?

This is a life threatening emergency and the following steps must be taken immediately:

1. The patient must be intubated and ventilated or else temporarily ventilated with a bag and face mask. External cardiac massage may also be needed.
2. Give 10 ml of 10% calcium gluconate slowly intravenously. This is an antidote for magnesium sulphate poisoning.

THE MANAGEMENT OF ECLAMPSIA**3-34 WHAT IS YOUR IMMEDIATE MANAGEMENT IF A PATIENT CONVULSES?**

The management of eclampsia is as follows:

STEP 1.

Prevent aspiration of the stomach contents by:

- (i) Turning the patient immediately on her side.
- (ii) Keeping the airway open by suctioning (if necessary) and inserting an airway.
- (iii) Administering oxygen.

STEP 2.

Stop the convulsion and prevent further convulsions by putting up an intravenous infusion of Plasmalyte B or Ringer's lactate and giving magnesium sulphate as described in 3-30.

STEP 3.

After the magnesium sulphate has been given, insert a Foley's catheter to monitor the urinary output.

STEP 4.

If the diastolic blood pressure is 110 mm Hg or more, it must be reduced with dihydralazine (Nepresol). Oral nifedipine can be used if the patient is fully conscious after the convulsion, as described in 3-29.

STEP 5.

The patient must now be urgently transferred to a level 2 or 3 hospital.

**ECLAMPSIA IS A LIFE THREATENING CONDITION FOR BOTH THE MOTHER AND THE FETUS.
IMMEDIATE MANAGEMENT IS, THEREFORE, NEEDED**

3-35 WHAT SHOULD YOU DO IF THE PATIENT CONVULSES AGAIN?

If the patient convulses again, after the convulsions had initially been controlled by the total loading dose of 14 g of magnesium sulphate, a further 2 g of magnesium sulphate is administered intravenously. This dose can be repeated once more in the unlikely event of the patient having yet a further convulsion.

The following management (sections 3-36 and 3-37) is not essential knowledge but should be read by medical and nursing staff working in level 2 or 3 hospitals.

THE FURTHER MANAGEMENT OF SEVERE PRE-ECLAMPSIA AND IMMINENT ECLAMPSIA AT THE REFERRAL HOSPITAL**3-36 HOW SHOULD YOU MANAGE THE PATIENT FURTHER IN A LEVEL 2 OR 3 HOSPITAL?**

Further management consists of either delivery or conservative treatment depending on:

1. The degree to which the patient's condition stabilizes, i.e. the diastolic blood pressure remains below 110 mm Hg and there are no symptoms or signs of imminent eclampsia. (Oral anti-hypertensive drugs must be given to control the blood pressure, if it is decided to continue conservative management).
2. The duration of pregnancy.
3. The condition of the fetus.

The patient must be delivered if any of the following apply:

1. The patient's condition does not stabilize.
2. The fetus is not nearing viability (less than 26 weeks).
3. The duration of pregnancy is 34 or more weeks.
4. There is fetal distress.

If none of the above apply, then the patient can be managed conservatively until 34 weeks' gestation, or the maternal condition deteriorates or fetal distress develops.

THE MATERNAL CONDITION MUST ALWAYS BE STABILIZED FIRST. THEREAFTER, THE CONDITION OF THE FETUS AND THE DURATION OF PREGNANCY MUST BE TAKEN INTO CONSIDERATION, IN PLANNING THE FURTHER MANAGEMENT OF THE PATIENT

3-37 WHAT IS THE CONSERVATIVE MANAGEMENT OF SEVERE PRE-ECLAMPSIA?

1. Magnesium sulphate is stopped.
2. Hospitalization for bed rest in a level 2 or 3 hospital.
3. The fetal movements must be monitored daily.
4. Antenatal cardiotocography (CTG) is very useful and if possible must be done twice or more daily. This is because of the risk of fetal distress, as a result of placental insufficiency or abruptio placentae.
5. Urinary tract infection must be excluded.
6. A platelet count and renal function tests (urea and creatinine) must be done twice weekly. If the platelet count is less than 100 000, liver function tests should be done. Poor renal function, raised liver enzymes or a platelet count that falls further are indications for delivery.
7. An ultrasound examination is of value to assess fetal weight, to assess fetal viability. Remember that a patient with a viable, growth restricted fetus can present with a fundal height of 24, or even 22 weeks' gestation. Fetal growth must also be monitored.
8. Because of the danger of hyaline membrane disease in a newborn infant who, though viable, has a gestational age of less than 34 weeks, steroids (betamethasone 12 mg, Celestone-Soluspan) must be given intramuscularly to the patient, to enhance fetal lung maturity. A second dose must be repeated 24 hours later.
9. If the duration of pregnancy is unknown, and the clinical assessment or ultrasound size suggests a pregnancy of 34 weeks or more, the fetus must be delivered.
10. If there is no fetal distress and the presentation is cephalic, a medical or surgical induction of labour is done at 34 weeks' gestation.
11. If fetal distress is present, or the presentation is abnormal, a caesarean section is done.
12. A patient whose condition becomes well stabilized, must be placed on an oral antihypertensive drug. Alpha methyl dopa is the drug of choice. A high dosage must be used, e.g. 500 mg 6 or 8 hourly. If the diastolic blood pressure remains at 110 mm Hg or higher, a second or even a third antihypertensive drug is added.

*** *Nifedipine (Adalat) is the drug of choice, if a second antihypertensive drug is required. Prazosin (Minipress) or labetalol (Trandate) may be added, if a third drug is required. This form of management must take place in a level 3 hospital.*

If the decision is taken to manage the patient conservatively, the danger of prematurity, if the fetus is delivered, must continually be weighed against the danger of fetal distress or abruptio placentae, resulting in an intra-uterine death.

GESTATIONAL HYPERTENSION**3-38 WHAT SHOULD YOU DO IF A PATIENT DEVELOPS GESTATIONAL HYPERTENSION?**

A patient with a slightly elevated blood pressure (a diastolic blood pressure of 90 to 95 mm Hg), which develops in the second half of pregnancy, in the absence of proteinuria, may be managed in a level 1 hospital or clinic. If the home circumstances are poor, she must be admitted to hospital, for bedrest. Where the home circumstances are good, the patient is allowed bedrest at home, under the following conditions:

1. The patient must be told about the symptoms of imminent eclampsia. Should any of these occur, she must contact or attend the hospital or clinic immediately.
2. The patient must be seen weekly at a high risk antenatal clinic. In addition, she must be seen once between visits, to check the blood pressure and test the urine for protein.
3. If the patient cannot be seen more frequently, she must be given urinary reagent strips to take home. She must then test her urine daily and go to the clinic, should there be 1+ proteinuria or more.
4. No special investigations are indicated.
5. Alpha methyl dopa (Aldomet) must be prescribed to control the blood pressure.

*** *The abovementioned management of gestational hypertension improves the chance that the pregnancy will proceed normally, and decreases the risk of pre-eclampsia developing. The initial dosage of alpha methyl dopa (Aldomet) is 500 mg 8 hourly.*

*** *Patients with a diastolic blood pressure of 100 mm Hg or higher, must be admitted to hospital and alpha methyl dopa (Aldomet) must be prescribed. Once the diastolic blood pressure has dropped below 100 mm Hg, they are managed as indicated above.*

3-39 HOW SHOULD YOU MONITOR THE FETUS, IN ORDER TO ENSURE FETAL WELL BEING?

Fetal movements must be counted and recorded twice daily.

3-40 WHEN SHOULD YOU DELIVER A PATIENT WITH GESTATIONAL HYPERTENSION?

If the cervix is favourable ("ripe"), a surgical induction of labour is performed at 38 weeks' gestation. If not, one may wait until the cervix is more favourable, before inducing labour. The proviso, however, is that the maternal and fetal conditions must remain good. The pregnancy must not be allowed to continue beyond 40 weeks' gestation.

CHRONIC HYPERTENSION

These patients have hypertension in the first half of pregnancy, or are known to have had hypertension before the start of pregnancy.

3-41 WHICH PATIENTS WITH CHRONIC HYPERTENSION SHOULD BE REFERRED TO A LEVEL 2 OR 3 HOSPITAL?

A good prognosis can be expected if:

1. Renal function is normal (urea, creatinine or preferably a creatinine clearance).
2. Pre-eclampsia is not superimposed on the chronic hypertension.
3. The blood pressure is well controlled (a diastolic blood pressure of 90 mm Hg or less) from early in pregnancy.

These women can be managed at a level 1 hospital. However, women with chronic hypertension should be referred to a level 2 or 3 hospital for further management if:

1. Renal function is abnormal (urea, creatinine or preferably a creatinine clearance).
2. Proteinuria develops.
3. The diastolic blood pressure is 110 mm Hg or higher.
4. There is intra-uterine growth restriction.

3-42 WILL YOU ADJUST THE MEDICATION OF A PATIENT WITH CHRONIC HYPERTENSION WHEN SHE BECOMES PREGNANT?

Yes, she must be put onto alpha methyl dopa (Aldomet). Any diuretic must be stopped.

*** *In pregnancy, beta-blockers are not completely safe for the fetus, while diuretics reduce the intravascular fluid compartment, with adverse effects on placental and renal perfusion.*

*** *An ACE inhibitor, e.g. captopril (Capoten and enalapril (Renitec)), is completely contra-indicated in pregnancy, as intra-uterine deaths have occurred in patients on this drug.*

3-43 WHAT SPECIAL CARE IS NEEDED FOR A PATIENT WITH CHRONIC HYPERTENSION DURING PREGNANCY?

1. Any rise in the blood pressure or the development of proteinuria must be carefully looked for, as they indicate an urgent need for referral.
2. Postpartum sterilization must be discussed with the patient, and is recommended when the patient is a multigravida.

CASE PROBLEMS

CASE 1

A 21 year old primigravid patient is attending the antenatal clinic. Her pregnancy progresses normally to 33 weeks. At the next visit at 35 weeks, the patient complains that her hands and feet have started to swell over the past week. On examining her, you notice that her face is also slightly swollen. Her blood pressure at present is 120/80, which is the same as at her previous visit, and she has no proteinuria. She reports that her fetus moves frequently.

1. Why is this patient at high risk of developing pre-eclampsia?

Because she is a primigravida and has developed generalized oedema over the past week.

2. How should this patient be managed further?

She should rest a lot. She also should be seen at the antenatal clinic again in a week when she must be carefully examined for a rise in blood pressure or the presence of proteinuria.

3. What advice should this patient be given?

She should be told about the symptoms of imminent eclampsia, i.e. headache, flashes of light before the eyes, and upper abdominal pain. She should also be asked to count and record fetal movements twice a day. If any of the above mentioned symptoms are experienced, or if fetal movements decrease, she must immediately report to the clinic or hospital.

4. When you see the patient a week later she has a diastolic blood pressure of 90 mm Hg, but there is still no proteinuria. How should she be managed further?

The patient has pregnancy induced hypertension. If the home conditions are satisfactory, she can be managed with bedrest at home. She must be seen twice a week, and carefully monitored, to detect a rise in the blood pressure and the possible development of proteinuria. If the blood pressure rises and/or proteinuria develops, she must be admitted to hospital. If the home conditions are poor, she should be admitted to hospital for bed rest. The hypertension must be controlled with alpha methyl dopa (Aldomet).

CASE 2

At an antenatal clinic you see a patient who is 39 weeks pregnant. Up until now she has had a normal pregnancy. On examination, you find that her diastolic blood pressure is 95 mm Hg and that she has 2+ proteinuria.

1. How should this patient be managed?

She should be admitted to hospital as all patients with 2+ proteinuria must be hospitalized. She should also be delivered, as she is more than 38 weeks pregnant.

2. By what method should she be delivered?

If there is fetal distress or a malpresentation, a caesarean section should be done. Otherwise, a surgical induction of labour should be performed if the cervix is favourable. If the cervix is not favourable, the patient should be referred to a level 2 or 3 hospital for a medical induction of labour.

3. On examining this patient you observe that she has increased patellar reflexes, i.e. brisk knee jerks. How should this observation alter her management?

Increased tendon reflexes are a sign of imminent eclampsia. The diagnosis must be made, irrespective of the degree of hypertension or the amount of proteinuria. To prevent the development of eclampsia, the patient must be given magnesium sulphate.

4. What precautions should you take to make certain that the patient is not given an overdose of magnesium sulphate?

Overdosage will not occur, if the patient is given a loading dose of 14 g magnesium sulphate. Before each maintenance dose of magnesium sulphate is given, the patient's knee reflexes must again be examined. If the knee reflexes are still present, the next dose of magnesium sulphate can safely be given. However, if the reflexes are severely depressed or absent, no further magnesium sulphate must be given.

CASE 3

While working at a level 1 hospital you admit a patient with a diastolic blood pressure of 120 mm Hg and 3+ proteinuria. She is 32 weeks pregnant. On further questioning and examination she has no symptoms or signs of imminent eclampsia.

1. What is the danger to this patient's health?

The patient has severe pre-eclampsia. Therefore, the immediate danger to her life is the development of eclampsia or an intracerebral haemorrhage.

2. How should this patient be managed?

Her clinical condition must first be stabilized. An intravenous infusion should be started and a loading dose of 14 g magnesium sulphate must be given. This should prevent the development of eclampsia.

3. Is a loading dose of magnesium sulphate also adequate to control the high blood pressure?

No. Sometimes, the diastolic blood pressure will drop to below 110 mm Hg after a loading dose of magnesium sulphate has been given. In that case, no further management is needed for the hypertension. However, if the patient's blood pressure does not drop after administering the magnesium sulphate, intramuscular dihydralazine (Nepresol) 6,25 mg or 10 mg (one capsule) oral nifedipine (Adalat) should be given.

4. Should you continue to manage this patient at a level 1 hospital?

No. The patient should be transferred to a level 2 or 3 hospital, for further management.

CASE 4

A 37 year old, gravida 4, para 3 patient books for antenatal care. She has chronic hypertension and is managed with a diuretic. By dates and examination she is 14 weeks pregnant.

1. Should the management of the patient's hypertension be changed during the pregnancy?

Yes. The diuretic should be stopped, as these drugs are not completely safe during pregnancy. Instead, the patient should be treated with alpha methyl dopa (Aldomet).

2. What factors indicate a good prognosis for a patient with chronic hypertension during pregnancy?

Normal renal function, no superimposed pre-eclampsia and good control of the blood pressure during pregnancy.

3. How can superimposed pre-eclampsia be diagnosed during pregnancy.

The patient will develop proteinuria and/or a rise in blood pressure.

4. Why is it important to detect superimposed pre-eclampsia in a patient with chronic hypertension.

Because the risk of complications increases and as a result a preterm delivery may be necessary. The patient should, therefore, be transferred to a level 2 or 3 hospital if superimposed pre-eclampsia develops.

5. What should be seriously recommended during the puerperium in this patient?

A postpartum sterilization. Postpartum sterilization should be discussed with the patient during the pregnancy. Postpartum sterilization is particularly important as the patient is a 37 year old multipara.