UNIT 4 MEDICAL DISORDER0S COMPLICATING PREGNANCY

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4.0 OBJECTIVES

Afte completing this unit, you should be able to:

- make a correct diagnosis of these disorders during pregnancy;
- describe the effect of pregnancy on the course of disease;
- counsel on the effect of these disorders on course and outcome of pregnancy and delivery; and
- manage pregnancies and deliveries with appropriate interventions.

4.1 INTRODUCTION

Medical complications during pregnancy often adversely affect course and outcome of pregnancy. Pregnancy often has the effect of aggravating the associated medical disorders.

Maternal and perinatal morbidity and mortality are also found to be increased in pregnancy complicated by these disorders.

Outcome of these pregnancies can be significantly improved if these complications are timely diagnosed and effectively managed during pregnancy, labour and puerperium. Prepregnancy counselling prepares these woman for conception at right time and many complication can be avoided and minimised. One should also remember the alterations in the diagnostic and treatment plans which are to be made during pregnancy, which otherwise are used in the non-pregnant state. Results can further be improved if cases which are too complicated to be managed in the existing health care setups are timely referred to more specialised units which are better equipped and have considerable experience in the management of such cases.

In this unit emphasis has been placed on diagnosis and management of these disorders during pregnancy and effect of interaction between the disease and pregnancy.

4.2 HEART DISEASE IN PREGNANCY

Organic heart disease is a serious complication in pregnant women. After hypertension, haemorrhage and infection, it is fourth most common cause of maternal death and most common indirect cause of maternal mortality incidence is 1 % amongst hospital deliveries.

Types of Heart Lesion

1) Rheumatic valvular heart disease leading to mitral stenosis, mitral regurgitation. .
2) Congenital atrial or ventricular septal defect, patent ductus arteriosus, coarctation of aorta, pulmonary stenosis..
3) Other rare causes: hypertensive, thyrotoxic, syphilitic, coronary and cardiomyopathies.

Commonest cardiac lesion being that of rheumatic origin, which predominantly includes mitral stenosis (80%) followed by the congenital one. Over the years there is decrease in frequency of rheumatic fever and rheumatic heart disease and because of improvement in the medical and surgical therapy for congenital heart disease, more cases of congenital heart disease are seen complicating pregnancy.

4.2.1 Diagnosis and Evaluation During Pregnancy

Heart disease may be detected for the first time during pregnancy or more commonly a woman with heart disease presents for medical care after she has become pregnant.

Clinical findings due to physiological changes of normal pregnancy closely simulate those of organic heart lesions, leading to diagnosis of heart disease more difficult than in non-pregnant state.

Presence of ***anyone*** of the following criteria confirms organic heart disease during pregnancy:

1) Presence of diastolic murmur.
2) Cardiac enlargement.
3) Loud harsh systolic murmur associated with thrill.
4) Presence of arrhythmia.

You must remember to do a careful clinical examination of the cardiovascular system in all antenatal patients and whenever heart disease is clinically suspected or diagnosed; patient should be referred to cardiologist for confirmation and cardiac treatment. Ultimate clinical

diagnosis made by you should be a composite one including etiology, structures involved and functional grading.

The degree of functional disability is graded according to ''New York Heart Association (NYHA) classification". Which is as follows:

Class I: Patients with cardiac disease but no limitation of physical activity.

Class II: Patients with cardiac disease with slight limitation of physical activity. These patients are comfortable at rest but ordinary physical activity causes discomfort.

Class III: Patients with cardiac disease with marked limitations of activity. Discomfort occurs with less than ordinary activity.

Class IV: Patients with cardiac disease with discomfort even at rest.

Grading of cardiac lesion should be done whenever a patient is seen on first obstetric visit. Grading may change during pregnancy. Grading is a rough guideline and reflects the severity of the disease.

4.2.2 Effect of Heart Disease on Pregnancy

- There is an increased risk of intrauterine growth retardation, preterm delivery and foetal death.

  Reason: Inability to maintain adequate utero-placental circulation due to chronic hypoxia.

- If mother has congenital heart disease, there is increased incidence of congenital heart disease in the foetus (4.5% Vs 0.6% in overall population).

4.2.3 Effect of Pregnancy on Maternal Heart Disease

Due to haemodynamic changes of pregnancy there is increased risk of:

- congestive cardiac failure,
- pulmonary oedema
- subacute bacterial endocarditis.

Most Dangerous Period for Cardiac Failure during Pregnancy

One must remember that there are several periods during pregnancy when the danger of cardiac decompensation is especially increased.

- The first is between 12 and 32 weeks of gestation, most critical being between 28 and 32 weeks, when the haemodynamic changes of pregnancy peak and cardiac demands are maximum.
- The second dangerous time is during labour and delivery. As during labour every uterine contraction injects blood from the utero-placental circulation into the maternal blood stream, increasing cardiac output which may trigger congestive cardiac failure. Immediately after delivery also, there is sudden transfusion of blood from lower extremities and the utero-placental vascular tree to the systemic circulation, increasing the risk of congestive cardiac failure.

4.2.4 Management: Care during Pregnancy, Labour and Puerperium

Antenatal visits should be in consultation with a cardiologist at interval of two week up to 24 weeks and there after at weekly intervals. At each visit one must look for signs of congestive cardiac failure:

- Breathlessness and cough
- Crepitations at lung bases
- Tachycardia: if pulse rate is persistantly high (more than 100 beats/minute) she requires hospitalization.

You also have to:

- measure blood pressure and weight.
- re-evaluate functional grading of the heart.
- do routine antenatal checks in addition

Advice

Rest: Maximum rest is advised, patient should rest in bed 10-12 hours each night and 2 hours in the afternoon.

Diet: Should contain low salt to prevent excessive fluid retention. Avoid excess weight gain, because it places additional burden on the heart.

Avoid Anaemia: By adequate iron and folate supplementation.

Avoid Infection: as it may precipitate heart failure,intramuscular injection of penidure LA 12 (Benzathine penicillin) may be given at intervals of three weeks throughout pregnancy and puerperium to prevent recurrence of rheumatic fever.

Emphasize the need to follow the advice of the cardiologist.

Hospitalization

Grade I: should be admitted at 38 weeks of gestation to ensure that labour begins under optimal conditions and in the absence of congestive cardiac failure.

Grade II: Admit at 28 weeks and keep hospitalized till delivery.

Grade III and IV: should remain in the hospital throughout pregnancy.

Management of Cardiac Failure

Immediate treatment should be started preferably in consultation with a cardiologist; and is as follows:

1) Patient is placed in propped up position
2) Oxygen inhalation
3) Inj Morphine 15 mg intramuscular
4) Digitalization: Digoxin 0.5 mg is given intramuscular followed by tab Digoxin 0.25 mg orally at interval of 6 hours till emergency passes off. Digoxin crosses placenta but no adverse foetal effects have been noted with therapeutic maternal levels.
5) Diuretics: Inj Frusemide (Lasix), 20 mg should begiven intravenous or intramuscular followed by tab lasix 40 mg daily.
6) Aminophylline: 250 mg is given intravenously in acute phase, to relieve bronchospasm and is followed by oral therapy.

Foetal Monitoring: Should be done carefully as these patients have high incidence of antepartum asphyxia and intrauterine growth retardation. Repeated ultrasonography may be helpful for assessing foetal growth and well being. Ultrasonography is also important for the diagnosis of congenital malformations.

Cardiac Surgery During Pregnancy: It is better avoided during pregnancy. If it has to bo done, the best time is between 16 to 20 weeks of pregnancy. Indications for mitral valvotomy or balloon angioplasty during pregnancy are:

1) Development of pulmonary oedema not responding to medical management.
2) Profuse and uncontrollable haemoptysis
3) Progressive pulmonary hypertension

Placement of Prosthetic Heart Valve During Pregnancy: Although it is advisable to postpone open heart surgery until after pregnancy, occasionally valve replacement during

pregnancy may be life saving. Patients with valve replacement are at increased risk of thromboembolism. Anticoagulant therapy which they have to take life long is to be continued throughout pregnancy and puerperium.

Role of Termination of Pregnancy

Termination is rarely required solely on grounds of cardiac disease, Cardiac lesions, which carry high risk and in which termination is indicated are primary pulmonary hypertension Eisenmenger syndrome and severe ischaemic heart disease.

Care During Labour and Delivery

As we know that the patient is prone to heart failure during labour, following measures should be adopted:

- She should be kept in propped up, semi-recumbent position.
- Oxygen should be administered if she suffers dyspnoea
- Intramuscular injection of pethidine hydrochloride 100 mg, should be given for effective relief from pain and apprehension.
- Daily dose of drugs (Digoxin, Lasix) to be continued during the labour.
- Monitoring of pulse and respiration, if pulse rate exceeds 110/minute or if respiratory rate is above 24/minute, it suggests cardiac decompensation, for which intensive medical management should be instituted immediately.
- Prophylactic antibiotics should be given during labour to avoid the possibility of subacute bacterial endocarditis. For this purpose combination of Ampicillin 2 gm 1M or IV and gentamicin 1.5 mg per kg body weight, IM or IV followed by second dose of both 8 hours later, should be adminstered.
- Repeated per-vaginum examinations should be avoided and should be done only if absolutely necessary, to reduce the chances of infection.

Second Stage of Labour: This stage is usually quick in cardiac cases. If there is any delay it should be shortened by application of outlet forceps or vaccum extraction.

Ventouse is preferable to forceps as it can be applied without putting the patient in lithotomy position (raising the legs increases the cardiac load).

Third Stage of Labour: Routine use of prophylactic intravenous ergometrine should be avoided, to prevent sudden overloading of the heart by additional blood squeezed out from the uterus. However, if blood loss is excessive, inj ergometrine 0.5 mg 1M or oxytocin infusion should be administered.

Place of Caesarean Section in a Heart Disease Patient

Heart disease as such is not an indication for caesarean section, which should be done only for obstetrical indications. The anaesthesia should be given by an expert anaesthetist using epidural or general anaesthesia.

Trial of Labour: Should not be done in heart disease patients.

Induction of Labour: Is not indicated for heart disease alone and should never be done if the patient is in acute cardiac failure. If induction is to be done for obstetrical reasons, best method is by syntocinon infusion in relatively concentrated solution.

Care During Puerperium

- Delivery and immediate puerperium are the periods of maximum risk for cardiac failure, hence intensive monitoring should be continued for several days following delivery.
- One should closely monitor the patient for signs of heart failure, hypotension and arrhythmia.
- Can be discharged 10-14 days after delivery, after full assessment by a cardiologist.

l ***Breast feeding is not contraindicated unless patient is in cardiac failure.***

Contraception: Permanent sterilization should be considered after completion of family and is best done at the end of first week in the puerperium, provided the heart is well compensated. Barrier contraception (condom) is best for spacing. Steroidal contraception is contraindicated as it may precipitate thromboembolic phenomenon. Intra-uterine devices are best avoided because of fear of infection.

Congenital Heart Disease: Patients with congenital heart disease are surviving to the childbearing age because of availability of better diagnostic techniques, medical and surgical management. It can be cyanotic or acyanotic. Prognosis for the patients with cyanotic heart disease is significantly worse for the mother and foetus, hence they should be advised against pregnancy unless the lesion is corrected surgically. Ideally most women entering childbeareing age should have surgical repair of significant defects. Congenital heart lesions which carry significantly high maternal risk include, Eisenmenger syndrome, Ebstein anomaly, coarctation of aorta with hypertension and tetrology of Fallot.

Check Your Progress 1

1) The following statements apply to pregnant women with heart disease in pregnancy:

   a) Incidence of congenital heart disease in pregnancy is greater than rheumatic heart disease, in India. (True/False)

   b) Grading of cardiac lesion done according to "New York heart association classification" may change during pregnancy. (True/False)

   c) Risk of congenital heart disease in the baby is increased, if mother is suffering from rheumatic heart disease. (True/False)

   d) Risk of cardiac failure during labour is increased because of increased blood flow into utero-placental circulation. (True/False)

   e) In a case of rheumatic heart disease, presence of cardiac failure in the third trimester is an indication for induction of labour. (True/False)

2) In a patient of' Class I heart disease with pregnancy, hospitalization should be advised:

   i) At 28 weeks of pregnancy

   ii) At 38 weeks of' pregnancy

   iii) At 40 weeks of pregnancy

   iv) During early labour.

3) In a patient of rheumatic heart disease, breast feeding:

   i) Should be allowed in all the cases

   ii) Is contraindicated in all the cases

   iii) Should he allowed except in cases with cardiac failure

   iv) Decision is best left to the patient.

4.3 DIABETES MELLITUS

4.3.1 Definition

Diabetes Mellitus: It can be defined as a state of carbohydrate intolerance resulting from inadequacy of insulin secretion or in-effectiveness of insulin action. **Pregnancy causes a diabetogenic influence on the normal and on existing carbohydrate abnormality.**

Gestational Diabetes: It is carbohydrate intolerance of variable severity with onset or first recognition during present pregnancy. It requires reclassification after delivery (Glucose tolerance test should return to normal 6 weeks after delivery). Risk of foetal morbidity and mortality is increased and can be prevented by appropriate treatment.

4.3.2 Diagnosis of Diabetes Mellitus

Diabetes is self evident in patients with abnormal carbohydrate metabolism before pregnancy requiring diet or insulin therapy to maintain metabolic control.

Diagnosis of Gestational Diabetes

You must remember that vast majority of pregnant women with diabetes have gestational diabetes of which there are no signs or symptoms, and can be diagnosed only through the laboratory tests. Screening for diabetes should be done during pregnancy and a Glucose Tolerance Test (GTT) should be done in patients at risk for diabetes during pregnancy. Following are the indications for GTT during pregnancy:

1) Positive family history of Diabetes in the first degree relatives (sibling or parent)
2) Gross obesity
3) Previous history of unexplained perinatal death, delivery of a large infant (>4000 g), congenital anomaly, prematurity.
4) Significant glycosuria: second fasting specimen of urine showing glycosuria.
5) Development of macrosomia, polyhydramnios.
6) Recurrent severe moniliasis, urinary tract infections.
7) If fasting blood sugar exceeds 90 *mg/dl* or if 2 hours post prandial blood sugar exceeds 120 mg/dl, on routine checkup.

How should you do GTT (glucose tolerance test) in pregnancy?

Patient is instructed to consume high carbohydrate diet for at least 3 days before the test. On the day of the test a fasting blood sugar sample is taken. Then she is given 100 g of glucose load, blood sugar samples are drawn one, two and three hour later. Concomitant urine sugar is also done to detect glycosuria and to determine appropriate renal threshold for glucose.

How should you interpret glucose tolerance test result in pregnancy?

Following are the upper limit of normal, whole blood glucose values for the 3 hour GTT.

Fasting 90 mg/dl

One hour 165 mg/dl

Two hours 145 *mg/dl*

Three hours 125 *mg/dl*

If two or more of these values are abnormal the patient has gestational diabetes.

When should GTT be performed during pregnancy?

You should screen for GTT between 24 to 28 weeks of gestation.

4..3.3 Effect of Pregnancy on Diabetes

More insulin is necessary to achieve metabolic control and there is tendency toward metabolic instability during pregnancy. There may be progression of diabetic retinopathy and worsening of diabetic nephropathy.

4.3.4 Effect of Diabetes on Pregnancy

You should know that a diabetic pregnancy is more prone to certain complications, which are:

1) **Spontaneous Abortions:** risk of abortion is more in uncontrolled diabetics.
2) **Polyhydramnios** is common due to large foetus, large placenta, foetal polyuria due to maternal and foetal hyperglycaemia.

3) **Pre-eclampsia:** risk is increased about 4 times and contributes to increased perinatal mortality.

4) **Infections:** there is higher incidence of asymptomatic bacteriuria, urinary tract infections and monilial vulvovaginitis.

Effect of Maternal Diabetes on the Foetus and Newborn

1) Perinatal morbidity and mortality is considerably increased compared with that of general population and it basically depends upon degree of blood sugar control.

2) **Congenital malformations:** There is threefold increased risk of major malformations in women with overt diabetes, its incidence being around 4%. Most common anomalies are that of heart and central nervous system and include anencephaly, Spina bifida, transposition of great vessels and ventricular septal defect. Strict control of diabetes in the periconception period, reduces incidence of malformations.

3) **Macrosomia and birth trauma:** Diabetic infants are oversized and oedematous due to excessive deposition of fat.

   Mechanism of macrosomia: Maternal hyperglycaemia results in excess transfer of glucose to the foetus → hyperplasia of foetal pancreatic beta cells → increased secretion of foetal insulin resulting in carbohydrate utilization and increased deposition of fat.

   Strict control of diabetes can prevent foetal macrosomia which occurs in 30-40% cases of gestational and overt diabetes. Foetal macrosomia results in increased incidence of birth injuries including shoulder dystocia, fracture of clavicle.

4) **Intrauterine death** of foetus is most likely to occur in the last 4 weeks of pregnancy. Incidence high is uncontrolled diabetics, Adequate control of diabetes can prevent foetal death.

5) **Respiratory distress syndrome:** pulmonary maturity is delayed due to hyperinsulinaemia resulting in delayed pulmonary surfactant formation and respiratory distress syndrome.

6) **Neonatal hypoglycaemia mechanism:** foetal hyperinsulinaemia continues after delivery which results in glycogen storage leading to hypoglycaemia,

7) **Hyperbilirubinaemia, hypocalcaemia** and **hyperviscosity.**

4.3.5 Management During Pregnancy, Labour and Puerperium

Our aim of management should be:

l) Achieve metabolic state similar to that of non diabetic pregnancy

2) Avoid iatrogenic prematurity

3) Detect intrauterine foetal distress before foetal demise

4) Avoid maternal complications.

Management Starts before Conception

Pre-pregnancy Counselling: In which you should stress the importance of strict control of diabetes at the time of conception and throughout pregnancy.

- Once a woman desires pregnancy, she should be changed over to insulin, for better control of diabetes in the peri conceptional period.
- Estimation of glycosylated haemoglobin (Hb A_1 C) is a method of looking retrospectively at diabetic control. The concentration of HbA_1 C reflects mean plasma glucose concentration during previous 6-8 weeks. Value above 8% is associated with increased risk of perinatal mortality and congenital malformations.
- One should properly assess whether the patient is fit to become pregnant and one may have to treat retinopathy or hypertension before allowing pregnancy.

- Chances of offspring having diabetes should be explained and are 1 % if only mother is diabetic. If mother and father both are diabetic chances of diabetes in the offspring become 5%. The risk of offspring suffering from diabetes is three times than in general population.

Management During Pregnancy

Antenatal care: You should teach the patient self glucose monitoring and advise hospitalization if there is any problem of blood sugar control.

How to check for blood sugar control?

- Blood sugar can be checked with dextrostix, glucometer or by frequent blood sugar estimations. Urine testing is inadequate for blood sugar control, due to lowered renal threshhold during pregnancy.
- A complete blood sugar profile includes blood sugar testing immediately before each meal, 2 hours after each meal, just before bed time and at 2 AM. On such 24 hour blood sugar profile, modification in dietary intake or insulin dosages are carried out.

Goal of metabolic control in pregnancy is to keep mean daily blood sugar levels below 100 mg/dl without ketonuria or hypoglycaemia. For this purpose fasting blood sugar should be below 100 mg/dl and post prandial below 140 mg/dl.

One must remember that diet and insulin both are important for blood sugar control.

Diet

- Alone may control gestational diabetes.
- Diet should exclude simple sugars.
- Total daily calorie requirement is 30-35 kcal per kilogram of ideal body weight. As pregnancy is ketogenic, allowance for carbohydrate should be generous and should be 50% of total calorie allowance, rest 25 to 30% calories should be from protein and remaining 25 to 30% from fat.

What is the role of oral anti-diabetic drugs for management of diabetes during pregnancy?

They should not be used during pregnancy as they cross the placenta and may have teratogenic effect or produce neonatal hypoglycaemia.

Insulin therapy

Indications of insulin therapy in pregnancy are :

- Patient who was having oral antidiabetic or insulin therapy in the prepregnant state. Gestational diabetics who can’t be controlled on diet alone.
- **Insulin requirement increases with advancing gestation**

Most patients require twice daily injections of a mixture combining a quick acting insulin and one of intermediate duration. Most commonly employed regimen is, combination of intermediate acting and regular insulin before dinner and breakfast. Patients usually receive two third of total insulin dose with breakfast and remaining one third at supper time.

Morning insulin is a mixture of intermediate acting and regular insulin in a ratio of 2: 1 and remaining one third of insulin dose is given before dinner in 1: 1 ratio i.e.equal amount of intermediate acting (NPH) + regular insulin. Dosage and composition of mixture may have to be modified depending upon periodic plasma glucose readings.

Other Investigations

Apart from routine investigations

- **Urine culture** should be done at initial visit and repeated at 4 to 6 weeks interval.
- **Fundus examination:** to detect diabetic retinopathy.
- **Renal function test.**

- **Ultrasonography:** should be done in all cases to rule out congenital malformations at 16-18 weeks of pregnancy and may be repeated to assess foetal growth, to rule out foetal macrosomia and for biophysical assessment.
- **Assessment of foetal well being:** is very important as these cases have increased risk: of intrauterine death.
- **Clinical examination** should be done at each antenatal visit including assessment of amount of liquor amnii and size of the foetus.
- **Cardiotocography and ultrasound guided biophysical profile:** are also done to .ensure foetal well being. Frequuncy of these tests depends upon severity of the disease and presence of other complications

Time and Mode of Delivery

You should allow term delivery in cases of gestational diabetes with good blood sugar control and well controlled patients with overt fiabetes.

Advantages of term delivery include:

- Frequent onset of spontaneous labour
- Assured lung maturity
- Less neonatal morbidity

Induction of labour is done at 38 weeks or earlier if:

- Patient is an unstable diabetic
- There is evidence of foetal distress or intra-uterine growth retardation.
- Presence of maternal complications like pre-eclampsia.
- Induction of labour if done prior to 38 weeks of pregnancy lung maturity should be ensured to reduce the risk of respiratory distress syndrome in the neonate.

Tests to assess lung maturity are:

- Estimation of lecithin/sphingomyelin ratio in the liquor amnii, a ratio of 2 or more, guparantees lung maturity.
- presence of phosphatidyl glycerol in the liquor, which is a more specific test than L/S ratio.

Mode of Delivery

Vaginal delivery is aimed for and caesarean section should be done only for obstetrical indications. One added advantage of vaginal delivery over caesarean section is reduced risk of respiratory distress syndrome.

Management During Labour

- Duration of labour should be limited and delivery should be conducted without trauma.

Control of Diabetes During Labour: Our aim is to maintain the blood sugar as near to 100 mg/dl as possible during labour. To achieve this one to two hourly estimations of blood sugar are done throughout labour and the insulin dose is adjusted; accordingly urine sample should be sent for acetone.

If labour is to be induced:

- No breakfast, no insulin on the morning of induction
- Start 500 ml of 5% glucose I-V drip and add 5 units of plain insulin in the drip.
- Drip should be given at a rate of 125 ml per hour

If the patient is to undergo elective caesarean section:

- No breakfast, no insulin in the morning.
- 1- V Saline drip should be started in the morning.

- Blood sample is sent for sugar estimation,
- Procedure should be scheduled early morning to simplify glucose control. **Remember that insulin requirements in these patients during labour and delivery are low. Management in the puerperium**:
- Following delivery insulin requirement dramatically falls and majority of patients do not require insulin for 24 to 48 hours.
- Blood surgar estimations should be repeated and patient should be started with half of her pre-pregnancy dose of insulin and further managed according to blood sugar levels.
- Breast feeding is encouraged. Insulin requirements may belower: in lactating women.
- Prophylactic antibiotics shouid be given to prevent infections.

Contraception

Sterilization should be advised once family is complete. Barrier methods (condom) should be used for spacing of birth. Oral contraceptives are best avoided as they are likely to intensify diabetes. Intra-uterine contraceptive device increases the incidence of pelvic infections.

Check Your Progress 2

1) Following statements apply to pregnant women with diabetes in pregnancy:

   a) In Gestational diabetes, glucose tolerance test has to be repeated 6 weeks after delivery, irrespective of blood sugar values obtained at GTT. (True/False)

   b) Ideally carbohydrate intake should be drastically cut down few days before perfonning glucose tolerance test, for diagnosis of gestational diabetes. (True/False)

   c) Gestational diabetes is managed on diet alone and insulin therapy is never required. (True/False)

   d) Significant glycosuria: means second fasting specimen of urine showing glycosuria. (True/False)

   e) In case of gestational diabetes incidence of macrosomia is not increased. (True/False)

2) In a well controlled diabetic:

   a) Delivery should be done before completion of 38 weeks. (True/False)

   b) Polyhydramnios is uncommon. (True/False)

3) Concerning insulin dependent diabetes mellitus:

   a) Offspring of an affected mother hours 20% risk of developing disease in the first decade of life. (True/False)

   b) Neonate of a diabetic mother has increased risk of hyperglycaemia. (True/False)

   c) Hb A_1 C is a prospective index of glucose control over 4-6 weeks. (True/False)

4) Best time to screen for diagnosis of gestational diabetes during pregnancy is:

   a) in the first trimester for early diagnosis.

   b) 16 to 18 weeks of pregnancy.

   c) 24 to 28 weeks of pregnancy.

   d) At 38 weeks of pregnancy.

5) In a pregnancy complicated by diabetes mellitus maximum risk of intrauterine death is:

a) before 20 weeks of pregnancy.

b) between 24 to 28 weeks of pregnancy.

c) between 32 to 36 weeks of pregnancy.

d) After 36 weeks of pregnancy.

4.4 URINARY TRACT INFECTION

This includes asymptomatic bacteriuria and pyelonephritis in pregnancy.

4.4.1 Asymptomatic Bacteriuria

It is defined as presence of significant amount of bacteria: (> 1 00,000 per ml) in the midstream specimen of urine on two occasions, in a patient without any symptoms.

Incidence

Ranges from 2-10% during pregnancy. E. coli is the offending organism in over 80% of cases.

Significance

If asymptomatic bacteriuria is untreated in pregnancy, 25-30% women will develop acute pyelonephritis. There is higher risk of pregnancies being complicated by anaemia, hypertension, preterrn labour and low birth weight babies. Women also run a greater risk of developing chronic renal lesion in later life.

Treatment

About 60-70% of all pyelonephritis cases can be prevented by finding and treating asymptomatic bacteriuria during pregnancy. Treatment consists of 7 to 14 days course of antimicrobial therapy according to culture and selisitivity report of urine. Cephalosporins and Ampicillin are amongst safe antibiotics to be used during pregnancy.

4.4.2 Pyelonephritis

It is the infection of renal pelvis, ureter as well as renal parenchyma.

Incidence

Between 1 to 2%

Diagnosis

By presence of fever with chills and rigor, flank pain, dysuria together with a positive urine culture.

Effect on Pregnancy

There is higher incidence of abortion, preterm labour, intrauterine growth retardation and intrauterine foetal death due to hyperpyrexia.

4.4.3 Management of UTI

Management of UTI could be preventive or curative.

Prevention is done by detecting and treating asymptomatic bacteriuria adequately.

Curative Measures

In acute attack, patient should be hospitalised, midstream urine should be collected for protein, sugar and pus cells; urine is cultured for organisms and sensitivity tested for antimicrobials.

- If there is fever with vomitings,lntra-venous fluids may be necessary, urinary output is carefully measured.

- Specific therapy includes administration of antimicrobial drugs by oral route or by intravenous route in more acute cases. Ampicillin or a cephalosporin is usually administered intravenously in a dose of 1-2 g every 6 hours. If there is no appropriate ‘response, injection gentamicin 60- 80 mg 1M is added 8 hourly. After obtaining culture and sensitivity report, appropriate antimicrobial agent can be selected. Once acute phase is over oral therapy with cephalosporin orampicillin 500 mg four times a day is continued for 10-14 days. Alternatively, 10-14 days course of Nitrofurantoin (Furadantin) 100 mg thrice a day, should be given depending on culture and sensitivity report. Periodic culture of urine will assist in detecting recurrence. In case of relapse or reinfection antibiotic course should be repeated and in such cases low dose antimicrobial prophylactic therapy (Nitrofurantoin 100 mg every night) is recommended, througout pregnancy.

Check Your Progress 3

1) Most common organism responsible for asymptomatic bacteriuria during pregnancy is:

   a) E. coli

   b) Streptococcus

   c) Staphylococcus

   d) Acinetobacter

2) When the pregnancy is complicated by pyelonephritis, risk of following complications is increased except:

   a) Abortions

   b) Congenital malformations

   c) Premature labour

   d) Intrauterine growth retardation

3) Fill in the blanks:

   a) If asymptomatic bacteriuria is untreated in pregnancy..... % women will develop pyelonephritis.

   b) Recurrence of asymptomatic bacteriuria during pregnancy can be diagnosed by.

4.5 MALARIA

Malaria is predominatly a tropical disease. Malaria is transmitted by saliva of anopheles mosquitoes or by blood transfusion. The diagnosis is made on clinical features confirmed by the detection of malaria parasites in peripheral thick blood smear.

4.5.1 Effect on Pregnancy

There is increased incidence of abortion, pretern labour, intrauterine growth retardation and stillbirth. These are caused by pyrexia itself and/or placental infection. Transplacental infection which is rare leads to congenital malaria and neonatal death. 10% foetus are born to women with plasmodium infection and will have the parasite in the cord blood. Primigravid are more susceptible to infection than multigravid. Exacerbation or relapse is also common in them. Severe complications of malaria include carebral malaria resulting in coma, convulsions, severe hemolysis and acute renal failure. In the foetus there is decrease in 200-300 gms of birth weight due to malaria.

Differential diagnosis

- Urinary tract infections
- Viral infections
- Other causes of pyrexia

Appropriate investigations will help in arriving at the correct diagnosis.

4.5.2 Treatment in Pregnancy

Chloroquine is the drug of choice during pregnancy. Tab chloroquine phosphate (lariago) 4 tablets (600 mg) initially, followed by 2 tablets after 6 hours, thereafter 1 tablet twice daily for two days, total 10 tablets are required. Chloroquine in above dose does not affect foetus. Alternatively you can give amodiaquine (camoquine) 3 tablets (600 mg) initially, followed by 2 tablets daily for 2 days. In pernicious malaria, chloroquine should be given parenterally. As a prophylaxis, chloroquine two tablets a week is quite effective until 6 weeks postpartum.

4.6 PULMONARY TUBERCULOSIS

Incidence

Pulmonary tuberculosis complicates 1-2 per cent of pregnancies in our country. The tubercular lesions in the lung may be active or quiescent.

4.6.1 Diagnosis

Most cases can be diagnosed on the basis of a history of cough and weight loss, positive tuberculin skin test, and X-ray chest. X-ray is not done routinely in pregnancy and should specially be avoided in the first trimester because of risk to the foetus. In patients with suggestive history or physical examination chest x-ray should be done after shielding the abdomen, to confirm the diagnosis. .

4.6.2 Treatment in Pregnancy

Treatment of active tuberculosis during pregnancy is only slightly different from that in non pregnant patients. Drug treatment should be done in consultation with a physician. Patient should be given Isoniazid (Isonex) 300 mg orally along with tablet ethambutol 800 mg daily. In active cases treatment is continued for 18 months to prevent relapse. Addition of one or more drugs may be necessary to reduce the prolonged duration of treatment or in cases with extensive or severe disease. Because of the risk of ototoxicity to the newborn streptomycin should be best avoided during pregnancy. The role of rifampicin in congenital malformations is not clear and should be given only after the first trimester is over. Isoniazid appears to be the safest drug during pregnancy. Pyridoxin 50 mg/day should be administered to prevent isonia zid- induced neuritis due to vitamin B_6 deficiency

Breast Feeding

It is not contraindicated once the mother is non infectious. However, if the lesion is active and in sputum positive cases, baby should be separated from the mother following delivery. The baby should be vaccinated with BCG as soon as possible and kept segregated for 6-9 weeks till mantoux test becomes postitive.

Prognosis

If the pregnant patient is adequately treated with antitubercular chemotherapy for active disease, tuberculosis generally has no deleterious effect on the course of pregnancy or on the foetus. Pregnancy if properly managed, also has no harmful effect on the course of pulmonary tuberculosis. Therapeutic abortion is also not recommended for most tuberculosis patients.

Check Your Progress 4

1) List four complications of malaria in pregnancy.

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.....

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2) In case of pulmonary tuberculosis complicating pregnancy:

   a) To confirm the diagnosis in the third trimester, x-ray chest should not be done and should only be done after delivery. (True/False)

   b) Streptomycin should not be given during pregnancy because of ototoxicity. (True/False)

   c) Isoniazid is the safest antitubercular drug during pregnancy. (True/False)

   d) Breast feeding is contraindicated in all patients with tuberculosis. (True/False)

3) Following statements are not true regarding pulmonary tuberculosis in pregnancy except:

   a) MTP should be advised if TB is diagnosed in the first trimester.

   b) Pregnancy adversely affects the course of pulmonary tuberculosis by aggravating it.

   c) Risk of congenital tuberculosis is very high.

   d) Baby should receive BCG vaccination after birth

4.7 JAUNDICE

As you already know jaundice is diagnosed when there is yellow discolouration of mucous membranes, sclera and skin. Jaundice during pregnancy could be caused by cholestasis due to steroid hormones or other causes. In our country, viral hepatitis is the commonest cause of jaundice. Viral hepatitis can become a serious condition during pregnancy and is a indirect cause of maternal mortality and also perinatal mortality.

4.7.1 Causes of Jaundice during Pregnancy

The causes of jaundice are listed below:

- Viral hepatitis/infective hepatitis
- Cholestatic Jaundice (also known as intrahepatic cholestatic jaundice of pregnancy or recurrent jaundice of pregnancy)
- HELLP syndrome
- Fatty liver during pregnancy
- Hyperemesis gravidarum
- Drug toxicity
- Infection—Malaria, leptospirosis, salmonella, disseminated tuberculosis

4.7.2 Diagnosis

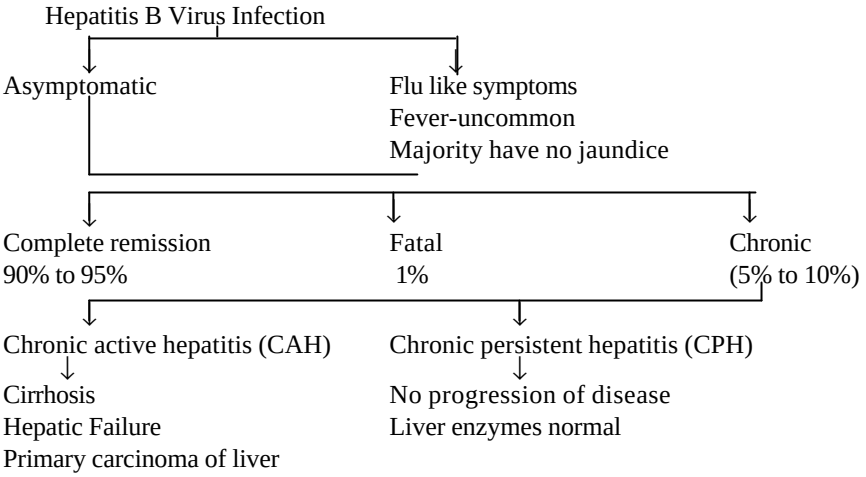
This section deals with diagnosis of various causes of jaundice and management.

i) **Viral Hepatitis**

Hepatitis is caused by different types of virus e.g. A, B, C, D and E. Hepatitis A is endemic in our country. Infection with E virus is similar in character to A but is a more serious condition and causes endemics in developing countries with significant maternal mortality. Hepatitis A, C and E are transmitted through enteric route.

You may be already aware that Hepatitis B is transmitted through parenterel route (blood transfusion, unsterile syringes and needles), sexual intercourse and vertical transmission from mother to foetus. Because of chronic carrier state and vertical transmission to foetus, hepatitis B is important to health care providers. Hepatitis D is similar in character to B and requires concomittent infection with hepatitis B virus.

Since clinical presentations of acute disease overlap, specific diagnosis is possible only by specific serological markers (antigen for HAV, HBV, HCV, HDV and HEV and or Ig M antibodies to these antigens). Hepatitis B infection is usually tested by HBsAg as it is a marker for ongoing HBV infection. Clinical course of HBV infection is shown below:



Because of the need for extensive laboratory investigation, all women having jaundice during pregnancy should be referred to tertiary care centers.

All pregnant mothers should be screened for HBsAg during first antenatal visit wherever possible. If found positive, their neonates should be administered hepatitis B immunoglobulin (0.5 ml 1M) within 12 hours after birth and active immunization with hepatitis B vaccine (within 12 hours after birth, one month and 6 months-0.5 ml vaccine IM). Since transmission during vaginal delivery is not conclusively proved, there is no indication for elective caesarean section. Breastfeeding is not contraindicated and baby need not be separated from the mother at birth as these practices do not prevent infection in the neonate.

ii) **Cholestatic Jaundice of Pregnancy**

After viral hepatitis, this is the next common cause of jaundice during pregnancy. Generalized pruritus, mild jaundice and intra-hepatic cholestasis occurs in the third trimester. Itching becomes severe and all symptoms are relieved in 2-3 days following delivery. If you take a proper history, you will elicit history of jaundice in past pregnancies and also in the family history of jaundice. The cholestatic jaundice of pregnancy has a genetic predisposition and is due to increased sensitivity to sex steroid hormones and altered membrane composition of bile ducts and hepatocytes.

iii) **HELLP Syndrome**

You will be reading more about it in unit 7. Some women with severe pre-eclampsia may develop hepatic dysfunction and present as hypertension, elevated liver enzymes and low platelet count (HELLP). It may be associated with severe pain in right hypochondrium due to subcapsular haemorrhages and jaundice and may develop DIC. Mothers with severe hypertension/preeclampsia should be referred and treated in a referral centre.

iv) **Acute Fatty Liver of Pregnancy**

It is a rare condition seen in obese primigravid women. Pre-eclampsia and multiple pregnancy may be associated. Maternal and foetal mortality are high.

v) **Hyperemesis Gravidarum**

Excessive vomiting leads to prolonged starvation and dehydration and these cause hepatic dysfunction. This can be controlled by correcting dehydration, ketosis and control of vomiting.

vi) **Drug Toxicity**

Drug such as rifampicin, isoniazid, tetracycline, paracetamol, methyl dopa can cause hepatic dysfunction and you should ask for history of taking these drugs currently or in the immediate past.

vii) **Infection**

Infection with malaria, leptospirosis, salmonella and disseminated tuberculosis can cause haemolysis and jaundice. Associated other symptoms and signs may be present. Specific investigations are required in such cases.

You would have realised by now that jaundice with pregnancy is a serious condition and requires referral to appropriate referral centers for investigations and treatment.

Check Your Progress 5

1) List two common causes of jaundice during pregnancy.

   .....

   .....

2) The marker for diagnosis of HBV infection is .....

3) List two reasons for importance of hepatitis B infection during pregnancy.

   .....

   .....

4) What does HELLP stand for in HELLP syndrome?

   .....

   .....

4.8 LET US SUM UP

In this unit you have learnt about medical diseases like heart disease, diabetes mellitus, urinary tract infections, malaria, tuberculosis and jaundice complicating pregnancy. Association of heart disease with pregnancy increases the risk of many foetal and maternal complications. Foetal outcome is compromised due to increased incidence of intrauterine growth retardation, preterm delivery and perinatal death. Maternal morbidity and mortality is also increased with increased risk of congestive cardiac failure, pulmonary oedema, and subacute bacterial endocarditis. There is no doubt that pregnancy involves greater risk for cardiac patients but with constant supervision throughout pregnancy, labour and puerperium the foetal and maternal morbidity and mortality can be greatly reduced.

In this unit we also discussed abnormalities of carbohydrate metabolism namely diabetes mellitus and gestational diabetes complicating pregnancy. You learnt that the association of diabetes in pregnancy is an additional risk to the mother and foetus. You also learnt that the incidence of maternal and foetal complications can be reduced to great extent if the blood sugar is properly controlled. To achieve good perinatal outcome, control of blood sugar should start even before conception, should continue throughout pregnancy, labour and delivery. Diet and insulin both are important for blood sugar control.

You also learnt how to diagnose and manage common medical problems like urinary tract infections, malaria and tuberculosis, during pregnancy, with emphasis on alteration in management plans in consideration to pregnancy. The section on jaundice during pregnancy will help you to manage this, not so rare a complication.

4.9 KEY WORDS

Asymptomatic Bacteriuria : defined as the presence of actively multiplying bacteria, somewhere within the urinary tract, excluding the distal urethra, at a time when the patient has no urinary symptoms.

Gestational Diabetes : defined as carbohydrate intolerance of variable severity with onset or first recognition during the present pregnancy.

HAV : Hepatitis A virus

HBsAg : Hepatitis B Surface Antigen

HBV : Hepatitis B virus

HCV : Hepatitis C virus

HDV : Hepatitis D virus

HEV : Hepatitis E virus

Vertical Transmission : Transmission from mother to foetus.

4.10 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) a) False
   b) True
   c) False
   d) False
   e) False
2) ii)
3) iii)

Check Your Progress 2

1) a) True
   b) False
   c) False
   d) True
   e) False
2) a) False
   b) True
3) a) False
   b) False
   c) False
4) c)
5) d)

Cheek Your Progress 3

1) a
2) b
3) a) 25 to 30%
   b) repeated culture of urine

Check Your Progress 4

1) Abortion, Preterm Labour, IUGR and still birth.

2) a) False

   b) True

   c) True

   d) False

3) b)

Check Your Progress 5

1) a) Viral Hepatitis

   b) Cholestatic jaundice of pregnancy

2) HBsAg

3) a) Chronic Carrier state

   b) Vertical transmission of infection to foetus

4) Hypertension, Elevated Liver enzymes, Low Platelet count.

4.11 FURTHER READINGS

Arias Fernando (1993). "Practical Guide to High Risk Pregnancy and Delivery'', *Mosby-year Book*, USA. Chapter 2, ''Cardiac Disease and Pregnancy'' p. 213, and Chapter 15, ''Diabetes and Pregnancy'', p. 280.

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