WISELEAF SCIENTIFIC VENTURES

COMPREHENSIVE PREGNANCY CARE: AN EVIDENCE-BASED MULTIDISCIPLINARY APPROACH

Chapter 7

High-Risk Pregnancy, Warning Signs and Emergency Management

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Abstract

It is essential for the pregnant woman regarded as having high-risk factors to assess the maternal and fetal risk results and keep them monitored on a regular basis, carrying out appropriate interventions and organizing health care management. This chapter lists the key conditions classified as high risk during pregnancy, including gestational diabetes mellitus, pregnancy-associated hypertension, either anaemia or bleeding conditions, and pregnancy-related infections. Besides this, risk factors, clinical features, possible complications the mother and fetus may suffer, diagnostic techniques, prevention measures, and treatment recommendations are given. Special attention is paid to pregnancy-associated hypertension and preeclampsia since these conditions could develop rapidly and lead to significant morbidity in both mother and fetus. The chapter talks about the important alert signs in pregnancy such as bleeding from the vagina, water leaking, stomach cramps, continuous headaches, seeing problems, fevers and sudden swelling of the body. Understanding the symptoms and going to the doctor promptly can help to prevent serious health problems. It also deals with the most common obstetric emergencies and the rules of initial evaluation and treatment. It highlights the importance of the treatment team in identifying the risk and monitoring and treating the patient. So, early detection, good treatment and referral of the patient is necessary for making pregnancy safer.

Keywords: High-risk pregnancy; Gestational diabetes mellitus; Hypertensive disorders; Maternal health; Obstetric emergencies

7.1 High-Risk Pregnancy

A high-risk pregnancy refers to a pregnancy wherein the mother, the fetus, or both are more likely to encounter complications throughout the stages of pregnancy, labor, delivery, or the postnatal time period. These complications may occur due to maternal illnesses, prior obstetric history, complications of the current pregnancy, fetal situations, or both social and environmental issues. Detecting and dealing with the risks early is essential to ensure the best possible outcomes for mothers and infants. A high-risk pregnancy demands proper prenatal care that is tailored to suit the risks involved. While some women need extra prenatal checkups and tests, others may require special medical care or delivery in locations with equipped maternal and fetal care services. Because the risk assessment changes through the course of pregnancy, checkups should not be limited in time.

7.1.1 Definition and Concept

High-risk pregnancy is a term associated with a possible increase in the risk of adverse maternal or fetal outcomes as compared with a normal uncomplicated pregnancy.[1] High-risk pregnancies can be identified before conception, early in pregnancy, or at a later time during pregnancy. Certain factors and conditions, such as pre-existing diabetes, hypertension, cardiovascular conditions, or prior obstetrical complications, can be identified before pregnancy or very early in pregnancy. In other situations, conditions arise during pregnancy, including gestational diabetes, pregnancy-induced hypertension, bleeding, or abnormal growth of the fetus. The main goals of managing a high-risk pregnancy include identification of risk factors, prevention of complications, monitoring of mother and fetus health, timely treatment if needed, and proper referral to specialists when appropriate. An important component of management of high-risk pregnancies is good communication between the patient and care providers.[2]

7.1.2 Risk Factors and Classification

Risk indicators connected to high-risk pregnancies can be divided into maternal factors, obstetrical factors, fetal factors and social or environmental factors. Maternal risk factors include advanced maternal age, obesity, undernutrition, anaemia, diabetes, high blood pressure, thyroid dysfunction, heart disease, kidney disease, epilepsy, and many other chronic diseases. In addition, some infections and exposure to toxic substances can increase the risk of pregnancy complications.[3] Obstetrical factors encompass experiences of multiple pregnancy losses, premature birth, stillbirth, Caesarean delivery, post-delivery bleeding events or hypertensive disorders during previous pregnancies. Complications manifested in the current pregnancy, including diabetes, pre-eclampsia, bleeding disorders, and premature birth, may qualify a pregnancy as a high-risk one. The fetal factors include multifetal pregnancy, stunted growth of the fetus, suspected abnormalities, fetal positional disorders, placental problems, and

abnormalities in the amount of amniotic fluid. Environmental risk factors include lack of access to healthcare, bad nutrition, social isolation and other factors. Depending on the severity of risks, pregnancies can be classified as high risk, requiring thorough prenatal monitoring or healthcare in a specialized clinic.[4]

7.1.3 Maternal and Fetal Risk Assessment

Risk assessment is a very important component in every prenatal visit. The process starts with gathering detailed medical, past pregnancy, and family history, followed by an examination by a physician and the necessary lab and imaging tests. As shown in (Fig 1) Maternal assessment includes measuring the blood pressure, the body weight, as well as nutritional evaluation and surveillance of symptoms and signs of pregnancy complications. In accordance with the risk profile of the woman, assessment for anemia, diabetes, hypertension, infections, and other conditions is made. In doing an assessment of the fetus, one should pay special attention to growth, development, and wellbeing. Assessment of the fetus can include the evaluation of the fetal heartbeat, movements, height of the uterus, as well as several other parameters. If there are doubts about fetal development, congenital malformations, multiple pregnancies, and other complications then further assessments may need to be done. It should be kept in mind that the assessment should take into account the unique situations of the mother and the fetus because their health is interdependent. For example, hypertension in the mother can influence the function of the placenta. Women at a high risk require special counseling and monitoring.[5]

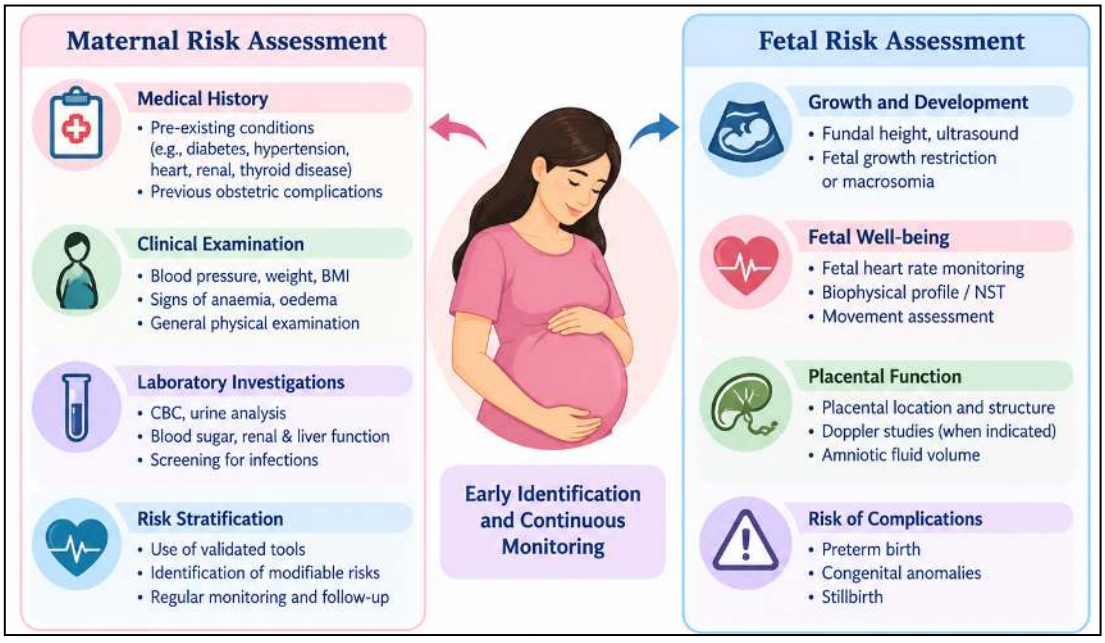


Figure 1: Maternal and Fetal Risk Assessment

7.1.4 Monitoring and Prevention

For women who have pregnancies that are high risk, routine individualized prenatal care is vital. The follow-up schedule is dependent upon the level and type of risk. Maternal condition, laboratory results, and medications used, as well as fetal health, must be reviewed from time to time. Preventive measures consist of early registration, pravidel'nyie prenatálníí návštevy, megfelelőin meal regimen, želik pomembnih dozi železa in folne kisline, cepljanja, infection prevention, physical activities and avoiding smoking, alcohol, and other harmful substances. Pre-existing health complications should be brought under control before and during pregnancy where possible. Education of patients is critical to prevention. Women nearing childbirth must know warning signs including bleeding, severe tummy ache, bad headache, vision problems, fever, and problems in breathing. They must know when medical attention and the nearest hospital must be sought. There should be a simultaneous involvement of obstetricians, nurses, pharmacists, lab specialists, nutritionists etc. in effective risk management.[6,7]

7.2 Gestational Diabetes Mellitus

As mentioned in (Table 1) GDM is a diagnosis of diabetes that occurs during pregnancy which is not clearly diagnosed before pregnancy. GDM occurs as a result of pregnancy-related increase in insulin resistance, especially during the second and third trimesters. Typically, GDM resolves after delivery; however, patients with GDM remain at an increased risk for developing type 2 diabetes in the long run, and they should be monitored closely after the birth of the child.

7.2.1 Risk Factors and Screening

Multiple reasons can raise the risk of developing GDM. The major risk factors include being overweight or obese, a history of GDM, a history of having a baby with high birth weight, family history of diabetes, advancing maternal age, a history of unexplained stillbirth, polycystic ovary syndrome, and other ethnic or cultural backgrounds with a higher prevalence of diabetes mellitus.[8] Despite this, GDM may occur in women who have no risk factors and, thus, proper testing during pregnancy should be performed. One of the conditions for testing is the use of the accepted antenatal care protocol. As a rule, in this situation, screening is carried out at the very first antenatal visit, at which time factors suggestive of presumably undetected diabetes or risk factors may become obvious. If the first screening test shows negative results, in some cases screening is repeated later. The test used for diagnosis is the 75-gram glucose tolerance test, despite the fact that different testing methods and types of evidence are used depending on the healthcare regulations.[9]

7.2.2 Diagnosis and Clinical Features

GDM is frequently asymptomatic, which makes screening an important part of antenatal care. Some women may experience symptoms of hyperglycaemia such as increased thirst, frequent

urination, excessive hunger, fatigue, or blurred vision, although these symptoms may be mild or difficult to distinguish from normal pregnancy changes. Diagnosis is based on blood glucose testing according to established criteria. Depending on the diagnostic approach, testing may include fasting plasma glucose, a 75-g OGTT, or other glucose measurements recommended by the relevant guideline.[10] The results should be interpreted using pregnancy-specific diagnostic thresholds rather than non-pregnancy criteria. Following diagnosis, assessment should also consider the woman's nutritional status, weight gain, blood pressure, previous obstetric history, and other risk factors. Appropriate documentation and regular review of glucose measurements help determine whether lifestyle measures are sufficient or pharmacological treatment is required.[11]

7.2.3 Maternal and Fetal Complications

Ineffectively managed GDM leads to many fetal and maternal complications. Maternal complications may be such disorders of increased blood pressure during pregnancy, preeclampsia, excessive growth of the fetus, C-section and other complications during the delivery. Women who have GDM also have a significantly increased chance of suffering from type 2 diabetes mellitus in their later life. Fetal and neonatal complications can consist of macrosomia and shoulder dysfunction of the fetus or birth injuries, neonatal diabetes, lung problems, and jaundice. Additionally, the presence of maternal hyperglycemia and other complications can increase the risk of negative outcomes of the pregnancy. GDM is likely to contribute to the future metabolic disturbances of the mother and the fetus.[12.13]

7.2.4 Management and Monitoring

The main objective of GDM (Gestational Diabetes Mellitus) management is to control blood glucose within appropriate limits during pregnancy while ensuring that the mother has an adequate diet and that her fetus grows properly. Management is started with dietary management, physical activity, and blood glucose monitoring. Diet should provide enough calories and nutrients for pregnancy but limit excessive consumption of fast sugars. The food intake should be divided during the day with certain eating patterns determined by individual needs based on mother's diet history, obesity status, blood glucose concentration, etc. Moderate physical workouts improve the effectiveness of insulin and help to control the blood glucose level in a mother. Activities should be chosen taking into consideration the health and pregnancy limitations of the woman. If target glucose levels are not reached by means of lifestyle adjustments, pharmacological treatment should be provided.[14]

Routine monitoring consists of checking blood glucose levels, maternal weight and blood pressure, adherence to the treatment, and fetal growth and health. Additional antenatal monitoring may be necessary when glucose levels are poorly controlled or there are other maternal complications or fetal risks involved. After childbirth, but many women may stop

their treatment for diabetes, screening in the postpartum period is particularly important because GDM puts women at a higher risk of developing type 2 diabetes later on in life.

Table 1: Gestational Diabetes Mellitus – Risk Factors, Complications and Management

Aspect	Key points
Risk factors	Obesity, previous GDM, macrosomia, family history of diabetes, advanced maternal age, PCOS
Clinical features	Usually asymptomatic; thirst, frequent urination, fatigue and blurred vision may occur
Diagnosis	Blood glucose testing and 75-g OGTT
Maternal complications	Hypertension, preeclampsia, excessive fetal growth, Caesarean delivery
Fetal/neonatal complications	Macrosomia, birth injury, respiratory problems, jaundice
Management	Diet, physical activity, glucose monitoring and medication when required
Follow-up	Maternal and fetal monitoring during pregnancy and postpartum diabetes screening

7.3 Pregnancy-Induced Hypertension

Hypertension during pregnancy is regarded as an important complication of this maternity condition, characterized by an increase in blood pressure during the period of pregnancy that could possibly create a problem for the health of both the mother and the fetus. Hypertensive disorders of pregnancy include chronic hypertension, gestational hypertension, preeclampsia, and eclampsia. These disorders may interfere with the normal functioning of the placenta and lead to organ dysfunction in the mother, consequences for the development of the fetus, preterm birth, placental separation, and other serious complications. The disease severity differs within women where some patients are able to advance from mild cases into severe forms of this disease in a short period. As such, it is necessary to ensure early detection of risk factors and regular updates of surveillance during pregnancy, timely treatment, explanation of disease and patient referral.

7.3.1 Types and Risk Factors

As shown in (Fig 2) the main types of hypertensive issues related to pregnancy include chronic high blood pressure, gestational hypertension, preeclampsia, and eclampsia. Chronic hypertension refers to high blood pressure that exists before conception or is identified during early pregnancy. Gestational hypertension occurs after the 20th week of pregnancy and involves an increase in blood pressure but the patient does not have protein in the urine (proteinuria) or any indications of impaired functioning of some organs. Preeclampsia is a

complication of pregnancy involving the appearance of high blood pressure followed by protein in the urine and/or information about the impaired functioning of some organs. The term eclampsia refers to the condition of a woman with preeclampsia who suffers fits.[15] A variety of maternal and pregnancy-related conditions can make someone more likely to develop hypertension. Some of the primary risk factors for developing pregnancy-induced hypertension are having a first pregnancy, having had preeclampsia in the past, carrying multiple fetuses at once, suffering from obesity, already having high blood pressure before trying to get pregnant, being diabetic, having chronic kidney problems, battling with autoimmune diseases, and having a family history of pregnancy-induced hypertension. Increasing maternal age as well as certain reproductive, genetic and health problems can also lead to a higher risk of developing hypertension. Having a history of severe preeclampsia and pregnancy with hypertensive complications should be taken seriously when assessing risks in the next pregnancy. Knowing these factors at the beginning of the pregnancy helps health providers classify women in pregnancy according to the degree of risk they are. Women with risk factors might have to undergo monitoring more frequently: perform regular blood pressure readings, conduct lab tests, and comply with the doctor's recommendations regarding preventative measures according to the clinical guidelines.[16]

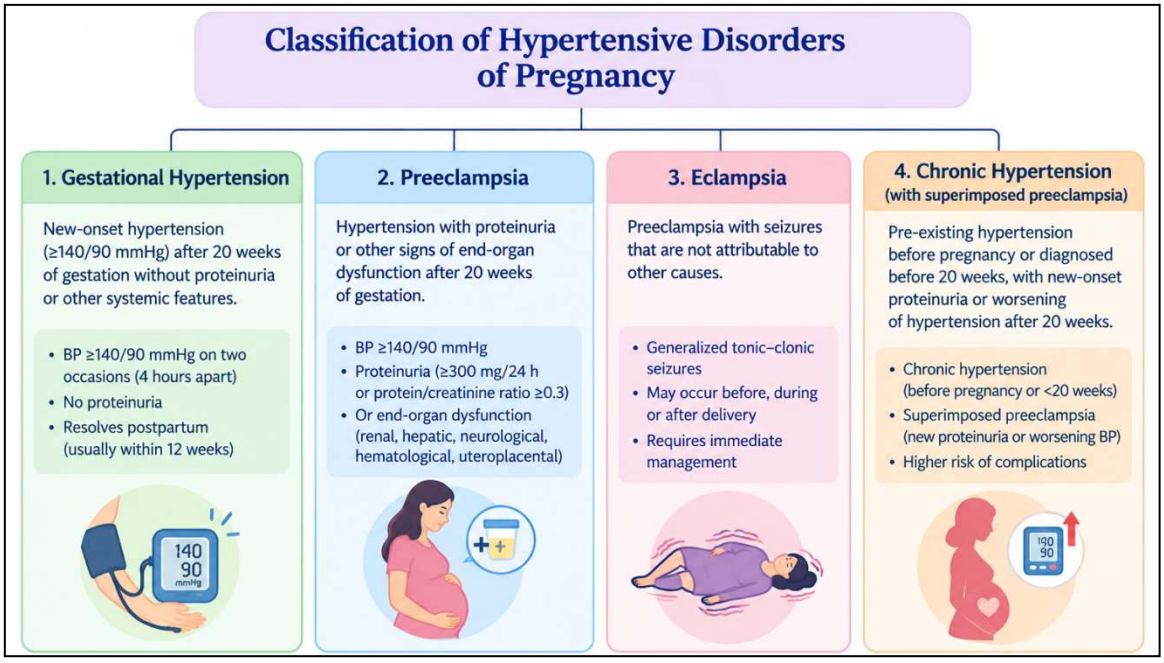


Figure 2: Classification of Hypertensive Disorders of Pregnancy

7.3.2 Gestational Hypertension and Preeclampsia

Gestational hypertension generally starts after gestational age of twenty weeks and involves high blood pressure occurring in the absence of proteinuria or dysfunction of maternal organs, as it may be a sign of preeclampsia. Gestational hypertension can be stable until the time of delivery or can progress to preeclampsia, which makes doctors conduct constant observation of patients declared as having gestational hypertension instead of assuming that their condition does not require anything else. Blood pressure must be checked and read with results of other checks and special instruments.[17]

Preeclampsia is a disease that is capable of affecting various systems of the body including kidneys, liver, nervous system, blood, and placenta. Women with preeclampsia may experience strong headache, changes in vision, upper abdominal pains, nausea or vomiting, sudden and significant edema, difficulty breathing, or a decrease in urine production. However, sometimes preeclampsia has no clearly marked symptoms, which makes pregnancy checkups crucial. The condition may also affect placental circulation and fetal development. Problems with placental function may cause fetal growth restriction, decrease of fetal oxygenation, premature birth, placental abruption, and stillbirth. Consequently, management should take into consideration both maternal and fetal well-being. Fetal growth, movements, heart rate, and other characteristics of fetal well-being should be monitored in accordance with the severity of the condition as well as the gestational age.[18]

7.3.3 Eclampsia and Complications

Eclampsia refers to a potentially fatal complication occurring due to preeclampsia with seizures not resulting from other neurological or metabolic disorders. Eclampsia can manifest during pregnancy, during labor or after birth. It is critical to treat eclampsia as an obstetric emergency as maternal trauma, lack of oxygen, aspiration, and fetal impairment can be a result of seizures. Treatment requires a prompt stabilization process and seizure treatment and further evaluation and management of the hypertensive disorder. Severe hypertensive problems can give rise to a number of maternal complications, including stroke, pulmonary edema, acute renal failure, hepatic failure, thrombocytopenia, HELLP syndrome, among others. Problems linked to prenatal and newborn periods can include either baby growth impact, ineffectiveness of placenta, premature birth, underweight baby, fetal suffering, and baby demise. Some problems can occur as a result of placenta disorders while other issues emerge due to the fact that baby delivery is required in order to save the mother’s or baby’s health. The probability of problems will depend on disease severity, how far pregnancy is, presence of accompanying maternal diseases, baby status, and the way of treatment.[19]

7.3.4 Management and Monitoring

Through adequate medical management of pregnant women with significantly high blood pressure these days we can bear satisfactory results. Individualized management is required taking into account the severity of hypertension as well as other specific characteristics of the case in question.16 Regular monitoring of blood pressure must be performed, including the assessment of symptoms that may occur (headaches, difficulties with vision, pain in the upper abdomen, breathing difficulties, sudden swelling, and reduction in urine output). Laboratory examinations may include urine protein tests, the assessment of platelet count, renal function, liver function, etc. Antihypertensive drugs can also be administered to prevent various complications due to hypertension. The medicines to be used depend on the clinical case. The treatment is selected by the physician. Magnesium sulfate may be administered to selected women with severe preeclampsia for the purpose of the prevention of the development of seizures. Monitoring the condition of the fetus is an important aspect of the treatment and can include evaluation of fetal movement, fetal heart rate, measuring of fetal development and ultrasound examination or other studies whenever necessary. Monitorings used depend on the stage of gestation and extent of the disease. When the condition of mother or baby worsens urgent action should be taken.[20]

The time and method of delivery depend on the stage of the pregnancy, the severity of the mother's illness, the condition of the child, the results of drug treatment and the presence of complications. Delivery is the main treatment for pre-eclampsia but the stabilization and treatment of mother-related complications are very important before and at the time of giving birth. Educating patients plays a significant role in risk management. Expectant mothers must seek medical assistance in case of persistent headache, problems with vision, pain in the stomach, swollen body parts, breathlessness, bleeding during pregnancy, less activity from the baby, or problems with nerves. Additionally, patients should understand the necessity of regular check-ups and complying with medication guidelines. In general, proper management of pregnancy-related hypertension needs early risk factor detection, continuous monitoring of the condition, and a healthcare team involved in the follow-up.[21]

7.4 Anaemia during Pregnancy

Pregnancy presents the issue of anaemia that results from reducing haemoglobin levels below the normal levels seen during pregnancy. As shown in (Fig 3) the introduction of anaemia occurs due to the higher demand for iron and other nutrients caused by increased blood volume and maternal requirements for both fetus and placenta. Among other reasons for the occurrence of anaemia, the main reason is iron deficiency, but other possible causes include folate increase, vitamin B12 deficiency, different infections, chronic illnesses, genetic disorders related to haemoglobin, and blood loss.[22]

7.4.1 Causes and Risk Factors

The principal cause of anaemia in pregnant women is iron deficiency, while iron deficiency might occur as the result of poor intake of iron, inadequate absorption of iron, excessive iron demand during pregnancy, and presence of existing iron deficiency. In the case of nutritional anaemia, deficiency of such vitamins as folate and vitamin B12 might lead to the same outcome. Additionally, anaemia might occur due to other causes, such as chronic and/or infectious diseases, parasitic diseases, hereditary disorders such as thalassaemia and sickle cell disease, or blood loss. Some factors might also raise the chance of becoming anaemic. Such factors include undernutrition, short periods between pregnancies, multiple pregnancies, previous case of heavy menstruations, previous cases of anaemia, repeated pregnancies, undernutrition in terms of qualitative food, and chronic medical illnesses. Another factor is digestive disorders which interfere with the absorption of nutrients and increase the risk of developing anaemia.[23]

7.4.2 Clinical Features and Diagnosis

The signs and symptoms of anaemia vary with the severity and etiology. Mild cases may show signs and symptoms that are perhaps not significant or negligible, while moderate to severe cases may show fatigue, malaise, dizziness, headaches, dyspnoea, palpitations, and decreased exercise tolerance. Physical examination may show pale conjunctiva, skin, or nail beds. In severe cases of anaemia, there may be strain on the heart requiring urgent evaluation. The condition is diagnosed primarily by measuring hemoglobin levels, and CBC is done to find hemoglobin values, hematocrit, mean corpuscular volume, and other parameters of red cells in the blood. In case of suspicion of iron deficiency, serum ferritin will help in assessing the iron stores. Other tests like peripheral blood smear, vitamin B12 assessment, hemoglobinopathy testing, etc., may also be done if clinically indicated. The assessment of anaemia should be done at regular intervals of antenatal care and assessment of severity and causes should be done before treatment initiation.

7.4.3 Maternal and Fetal Complications

Untreated or serious anaemia may impair maternal and fetal health. Some maternal problems from anaemia may include extreme tiredness, decreased physical capabilities, a higher likelihood of infections, heart stress, bad ability to tolerate bleeding during delivery, complications during childbirth, and an increased chance of maternal health problems. Serious anaemia may complicate problems during labour and after birth. Some problems for the unborn baby and newborn may include restriction of the unborn baby's growth, low birth weight, preterm birth, and impaired wellbeing of the unborn baby. Severe maternal anaemia may lead to a lack of oxygen for the placenta and mother. Iron deficiency also influences both the mother and the baby, that's why it is important to treat the deficiency properly during pregnancy. The

risk of complications depends on severity and duration of anaemia, as well the reason of this condition, gestational age, and others.[24]

7.4.4 Prevention and Management

Preventing anaemia starts with proper nutrition among the pregnant women, carrying out regular antenatal screening, and providing the right dosage of iron and folic acid supplements in accordance with the policy documents. Eating iron-rich food, which includes green leafy vegetables, legumes, meat, poultry, eggs, and fortified food, will help meet the nutritional needs. Eating foods rich in Vitamin C can enhance absorption of non-heme iron. The management of anaemia is proportionate to its severity and the underlying cause of its development. Oral iron supplements are often the mainstay treatment of iron-deficiency anaemia. For identified deficiencies such as folic acid or vitamin B12, supplementation is supplemented. Patients need dietary counselling about their diet and adherence to therapy since iron preparations can lead to gastrointestinal side effects that might affect compliance. In some cases, intravenous iron can be prescribed to women who either cannot tolerate oral iron or do not adequately respond to the treatment. Severe cases of anaemia may be subject to specialist assessment and in some cases to blood transfusion or some other urgent treatment. Follow-up assessment should include analysis of haemoglobin and evaluation of the response to therapy. Women must also be educated about the importance of compliance to treatment, their diet, and supplementation.[25]

7.5 Bleeding Complications

Bleeding in pregnancy poses a serious medical problem that can occur as early as implantation and persist until delivery. The importance of bleeding depends on the gestational stage, amount, duration, accompanying complaints, and cause of bleeding. Some causes of bleeding might be not serious while others might imply the need for prompt examination and intervention.[26]

7.5.1 Causes and Types of Bleeding

In general, bleeding during pregnancy is divided into early pregnancy bleeding and late pregnancy bleeding based on the period that the bleeding occurred. Early pregnancy bleeding can be caused by several conditions including implantation, termination, ectopic pregnancy, and gestational trophoblastic disease. Other possible causes of bleeding are cervix-related conditions, vaginitis, trauma, and sexual intercourse. Some common causes of bleeding during late pregnancy include the placenta previa, placental abruption, and vasa previa. Placenta previa is characterized by the presence of the placenta very close to the cervix, while placental abruption represents the premature detachment of the placenta from the uterus. In vasa previa, fetal blood vessels are positioned near the internal opening of the cervix. However, it should be noted that there may not be any visible bleeding externally while serious bleeding is going

on inside the body. Therefore, all cases of bleeding during pregnancy should be investigated duly.

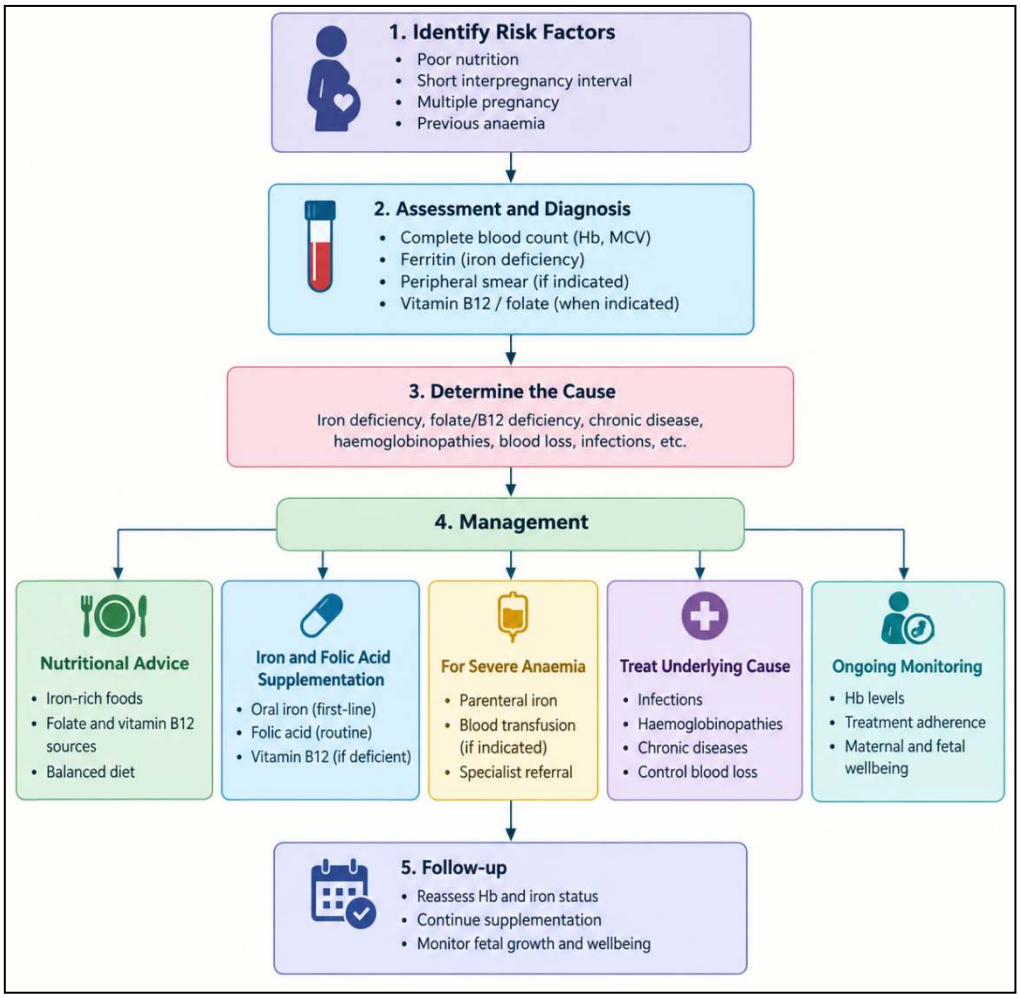


Figure 3: Assessment and Management of Anaemia in Pregnancy

7.5.2 Early Pregnancy Bleeding

Bleeding in the first trimester of pregnancy is relatively frequent, and there are many potential causes for it. In the case of threatened abortion, vaginal bleeding may occur with or without some mild abdominal pains, while the pregnancy itself remains intact. Spontaneous abortion is characterized by bleeding accompanied by abdominal cramps and the possible expulsion of some fetal tissue. The case of ectopic pregnancy should be examined especially when bleeding is accompanied by pain only on one side of the abdomen, discomfort in the shoulder, faintness, or dizziness, since such cases may lead to internal bleeding. Assessment of bleeding in early pregnancy includes evaluation of the woman's condition, gestational age, severity of bleeding,

and other symptoms. Depending on the situation, it may include pregnancy tests, hemoglobin level assessments, blood group tests, and ultrasound examinations that help to locate the fetus.

7.5.3 Antepartum Haemorrhage

Antepartum hemorrhage (APH) is defined as the presence of substantial bleeding from the genital tract in the last trimester of pregnancy. The primary causes are placenta previa and placental abruption. Placenta previa frequently is characterized by painless bright red vaginal bleeding that might recur. On the other hand, in cases of placental abruption, bleeding usually accompanied by abdominal pain, uterine tenderness, or contractions occurs, however, the extent of visible bleeding in each case can vary. Other causes of bleeding in the late gestation period include vasa previa, lesions of the cervix, infection, and damage. APH is responsible for loss of blood by the mother and can also result in poor oxygenation for the fetus. In cases of placental abruption severe complications might include mother's coagulation disorders, placenta previa however is responsible for the increased danger of bleeding during birth. Women with suspected APH must be immediately evaluated in a proper medical establishment. Vaginal examination must be performed with caution and is usually avoided until the confirmation of the absence of placenta previa.[27]

7.5.4 Assessment and Management

Prioritizing investigations during pregnancies complicated with bleeding is to assess maternal clinical situation in terms of vital parameters, hemodynamic state, gestational age, nature, and quantity of bleeding, as well as abdominal discomfort and uterine contractions, in addition to fetal condition. An obstetric history should be traced, indicating there were previous episodes of bleeding, previous Caesarean section, and some other important risk factors. Laboratory tests may involve complete blood counts, blood groups and Rhesus factor, and the studies of blood, only when the doctors find this necessary. Ultrasound can be used for evaluating placental position, fetal condition, and other possible causes of bleeding. The first treatment step is concentrating on stabilizing the mother's condition and finding out the causes of bleeding. Depending on the scope of bleeding, IV fluids, blood components and monitoring may be needed. The next step of treatment is determined by the cause of bleeding, how serious it is, how far along in the pregnancy the woman is, and the condition of both mother and fetus. In cases of ailments such as placenta previa, placental abruption and other serious conditions, hospitalization or surgery may be necessary. Therefore, women are advised to contact their doctor if they experience any vaginal bleeding, severe abdominal pain, feeling dizzy or fainting, less fetal movement than usual, or leaking of fluid.

7.6 Pregnancy-Related Infections

Infections related to pregnancy are a common cause of illnesses among mothers as well as their babies that can happen at any stage of the pregnancy. As mentioned in (Table 2) various

physiological and immunological changes that take place during pregnancy may have an effect on the body's susceptibility to different types of infections and their clinical presentations. While there are some infections that remain localized and can be easily treated, there are others that can travel throughout the body and cross the placenta to infect the unborn child. Some of the common infections associated with pregnancy are urinary tract infections, sexually transmitted infections, respiratory infections, reproductive tract infections, and a few others that can be passed from a mother to her child.

7.6.1 Common Maternal Infections

The occurrence of urinary tract infections (UTIs) increases in pregnancy and UTIs can be classified into three types: asymptomatic bacteriuria, cystitis, and pyelonephritis. The physiological changes occurring during pregnancy can result in ascending infection and thereby enhance susceptibility to UTI. The symptoms of urinary tract infection include dysuria, increased frequency and urgency of urination, and lower abdominal pain, whereas the symptoms of pyelonephritis include fever, chills, pain in the lower back region and nausea. Vaginal and reproductive infections can be caused by bacterial vaginosis, vulvovaginal candidiasis, and trichomoniasis. Symptoms include vaginal discharge, burning, itching, irritation, and bad smell. Sexually transmitted diseases, including syphilis, HIV, hepatitis B, gonorrhea, and chlamydia, are of great importance in pregnancy, as they can negatively affect women’s health and be transmitted to the fetus and newborn as well. Some viral illnesses may also have serious consequences in the course of pregnancy. Examples of viral infections include influenza, COVID-19, varicella, and diseases with congenital outcome such as cytomegalovirus, rubella, and toxoplasmosis.[28]

7.6.2 Maternal and Fetal Complications

There are many factors that determine the degree of infection complications, such as the germ causing the infection, severity of the disease, the timing of the infection, and the treatment effectiveness. One of the possible complications for the mother includes fever, dehydration, anemia, sepsis, kidney infection, and any other possible complication of respiratory system and other existing diseases. The complication may be severe enough to require hospitalization and a multidisciplinary team approach to treatment. The complication of infection can affect the fetus as well. The possible complications for the fetuses and neonates include miscarriage, fetal growth restriction, congenital disorder, premature birth, low birth weight, fetal infection, and neonatal sepsis. Some infections are capable of crossing the placenta, while others can infect the baby during childbirth. Fetal development stages at which infection occurs are especially important since they determine the fetal complications. This results in the great significance of prevention and early detection of infections in antenatal care.[29]

7.6.3 Screening and Diagnosis

Infectious disease screening is one of the key aspects of prenatal checks. The exact screening tests that are carried out depend on nationally established protocols, the medical history of the mother-to-be, her risk factors, signs of diseases, and the incidence of infectious diseases in the local area. The diagnosis of infections is based on clinical and laboratory findings. For example, urinary tract infections may be diagnosed by urinalysis and urine culture. By the same token, vaginal and cervical samples may be analyzed in case of reproductive tract infections. To diagnose a specific infection, blood tests (including antibody and antigen detection), molecular methods, etc., may be employed. Taking a thorough patient history is obligatory. The patient history may include information about previous illnesses, vaccination status, places where the patient has traveled or stayed, sexual behavior etc.[30]

7.6.4 Prevention and Management

In order to avoid infections during pregnancy, one must maintain personal hygiene as well as ensure safe food handling, safe drinking water practices, use vaccines advised for pregnancy, sanitize hands, and practice safe sexual behavior. They should observe all domestic guidelines and be given information on protecting themselves from disease outbreaks. Safe preparation of food and keeping away from contaminated food are also very important ways of preventing food infections. The management of the disease depends on the type of the disease and its severity. For example, antibiotic treatment must be as per the recommended guidelines of the clinical organizations and based on the type of bacteria and the condition of the mother. Aid in drinking plenty of fluids and eating well as well as getting good rest, monitoring symptoms, and regular checkups is very important for recovery from the infection. Many infections also require the treatment of sexual partners and measures avoiding infections in the newborn infant.

Table 2: Common Pregnancy-Related Infections and Their Complications

Infection/Condition	Key features	Possible complications
Urinary tract infections	Dysuria, frequency, urgency, fever	Pyelonephritis, maternal illness
Vaginal infections	Discharge, itching, irritation	Maternal and reproductive complications
Sexually transmitted infections	Syphilis, HIV, hepatitis B, gonorrhoea, chlamydia	Maternal and fetal/neonatal complications
Viral infections	Influenza, COVID-19, varicella, CMV, rubella	Fetal infection, congenital abnormalities, preterm birth
Toxoplasmosis	Maternal infection may be asymptomatic	Fetal and congenital complications

7.7 Warning Signs during Pregnancy

The warning signals leading to complications in pregnancy could be either signs or symptoms. There are certain physical signs or minor discomforts when a woman is pregnant and she should be aware of them, however, not every warning signal is to be ignored because it might suggest such complications as miscarriage, ectopic pregnancy, preeclampsia, diseases of placenta, infectious complications, premature labor or distress of the fetus. As shown in (Fig 4) the significance of the warning signal depends on how old the pregnancy is, intensity and duration of the signal and some other symptoms the pregnant woman might experience.

7.7.1 Vaginal Bleeding and Fluid Leakage

There are many causes for bleeding in pregnancy, which can be grouped into categories depending on their significance as well as it happens referring to certain scientific definitions Factors such as gestational age type of bleeding and other accompanying symptoms should also be considered. In the first trimester of pregnancy the causes of bleeding may be associated with implantation bleeding missed abortion ectopic pregnancy and cervix pathologies. In the second trimester and further in pregnancy bleeding from the vagina may be associated with placenta praevia or placental abruption. In the case of massive and prolonged bleeding as well as the presence of blood clots in the blood and some worrying symptoms medical attention should be provided.[31] Fluid leakage from the vagina can signify fetal membrane rupture, especially if it appears as an abrupt gush or constant trickle of clear or watery fluid. Leakage before labor happens can suggest premature rupture of membranes, which may predispose a pregnant woman to ascendant infection and premature labor. Sometimes, it can be tricky to tell the leak apart from either pee or vaginal discharge, thus possibly requiring healthcare consultation instead of self-assessment. Women in labor should promptly inform a medical expert of fluid leakage, especially if it is accompanied by fever, abdominal pain, contractions, bad smell, floods of blood as well as diminished fetal movements.[32]

7.7.2 Severe Pain, Headache and Visual Changes

Abdominal and pelvic pain during pregnancy must be assessed urgently, especially pain that occurs suddenly, gets worse continuously, or is accompanied by any bleeding, vomiting, fever, contractions, or dizziness. Severe abdominal pain during the early stage of pregnancy may indicate ectopic pregnancy or pregnancy failure, while significant pain later may be caused by placental abruption, preterm delivery, or other obstetric problems. In addition, sudden severe abdominal pain with weakness, fainting, or excessive bleeding needs immediate treatment. A bad or constant headache, in particular when it is uncommon for the lady and does not respond to standard treatment or occurs spontaneously, can serve as an important signal. If it is associated with blurry vision, flashes of light, partial loss of vision, and other visual problems, it may suggest a hypertension-related condition. Headache with significant upper abdomen or

epigastric pain, abrupt swelling, nausea, vomiting, decrease in urine output, and breathing problems increases the fears of serious maternal complications. Therefore, immediate assessment of blood pressure and clinical examination done are necessary.

7.7.3 Fever, Swelling and Breathlessness

Pregnant women experiencing elevated body temperature must take note, as this could be a sign of infection. Symptoms such as fever, chill, and weakness indicate something is transpiring. Other symptoms include pain during urination, continuous throwing up, stomach ache, coughing, hurting throat and bad odor from the vaginal area. In most cases, infections in pregnant women can worsen quickly and affect both mother and child negatively. Depending on whether the fever is persistent and high, doctors may need to be contacted to determine what could be causing this fever. In cases where there is vomiting or poor drinking, it is crucial that medical intervention be sought. During pregnancy, a woman's feet and ankle may swell. This is primarily due to the retention of fluids acquired while undergoing pregnancy. However, swelling experienced suddenly on the hands, feet, and face especially if coupled with headaches, vision problems, discomfort in the belly, and blood pressure changes is a clear indication of suspected preeclampsia that needs to be checked. It is important to consider every new case of swelling. Dyspnea can be experienced as a natural change in physiology during pregnancy, which results from increased oxygen consumption and adaptation in the respiratory system. On the other hand, if someone suffers from sudden breathlessness or is feeling worse and worse, that might be a sign of some problems and should be paid attention to, especially if it occurs with a chest pain, palpitations, fainting, cyanotic appearance, weakness or inability to speak.[33]

7.7.4 Reduced Fetal Movements and Other Warning Signs

Drastic decrease, absence, or major alteration in fetal movements post establishment of movements could be synonymous with fetal jeopardy and should be reported to medical personnel without delay. It is essential for the expectant mothers to understand the normal movement pattern of their unborn child instead of keeping track of the number of movements only. Shifting from the regular pattern should warrant a response from the healthcare provider without waiting for the next scheduled appointment. Assessment may be in the form of maternal examination, fetal heart monitoring, and ultrasound according to the nature of the pregnancy and clinical situation. Other significant warning signals are relentless vomiting that makes the retention of fluids or food impossible, extreme fatigue, fainting, seizures, confusion, chest pain, or difficulty breathing, as well as signs of serious infections. Severe itching that may present along with jaundice or dark urine may need investigation for liver diseases related to pregnancy. Signs of preterm labor like regular painful contractions of the uterus, pelvic pressure, lumbar pain, or any associated leakage of fluids must also be mentioned to the physician immediately.

Medical help must be sought by pregnant women when they experience sudden, serious, prolonged, or notably unusual symptoms related to the condition of pregnancy. It is essential for women who are considered to be high-risk pregnancies to be extra careful as problems can occur more suddenly or present themselves in a less obvious way. Regular prenatal checks allow the medical staff to monitor blood pressure, fetal development, tests results, etc., before complications arise. Educating women and their families is vital, as they must have clear understanding of warning signs. They need to know when and where to seek emergency help so that they do not postpone the treatment and avoid using home remedies or self-medication in case of serious problems.



Fig 4: Warning Signs during Pregnancy

7.8 Emergency Conditions and Precautions

Obstetric emergencies refer to any medical complications which arise before, during or after the birth of a baby and can lead to the deteriorating health condition or even the death of the mother or fetus. The key to effective management lies in the fact that because some complications can take place very quickly, they need to be correctly diagnosed and treated as soon as possible. Timely consultations prior to birth with experts in maternal health can help recognize high-risk pregnancies and provide the necessary emergency help.

7.8.1 Common Obstetric Emergencies

The most frequent obstetric emergencies involve serious vaginal bleedings, ectopic pregnancy, miscarriage with massive bleeding, abruption, placenta previa with major bleedings, serious

preeclampsia, eclampsia, and early membrane breakage with complications. There are also other critical situations, such as serious infection or sepsis, acute issues with breathing, thromboembolic incidents, and issues with premature labour among them. Some emergencies mainly threaten mothers, with others being potentially dangerous for both mother and child. During labour, emergencies can include postpartum hemorrhages, obstruction in delivery, uterine rupture, prolapsed umbilical cord, drawn-back umbilical cord, shoulder dystocia, and problems with placenta detachments. Doctors should act quickly and efficiently, assisting patients together. [34]

7.8.2 Initial Assessment and Stabilization

The very first step in the management of obstetric emergencies is the rapid evaluation of the mother's general state and immediate stabilization. Airway, breathing and circulation must be assessed, followed by consciousness, vital signs, bleeding, pain and other necessary symptoms. Oxygen should be given if there is a clinical need and venous access should be available if needed according to the situation where IV fluids and possible blood products must be ready as required. Prior to monitoring pregnant women, it should be done according to the gestational age and the clinical situation. Fetal heart sounds and fetal state must be determined when possible. Simultaneously, the examination has to include a number of laboratory studies which could include a full blood count, blood group and Rh factor test, coagulation studies, renal and hepatic tests, urine test, radiography or any specific investigations depending on the particular condition of the mother.[35]

7.8.3 Emergency Referral and Management

Women who have symptoms like severe bleeding and severe hypertension or have a suspected ectopic pregnancy or severe stomach ache, as well as breathing difficulties, less fetal movements than usual, problems with the placenta or other serious signs should be examined right away. If a hospital cannot supply necessary health services, the woman has to be sent to a more suitable one. A referral must be supported with related clinical information, examination results, a description of the treatment already given to the patient, and the medical status of the lady. Emergency treatment depends on the diagnosis, the severity of the situation, gestational age, and clinical characteristics of both mother and fetus. Various treatment techniques may be applied, including controlling the blood loss and treating the hypertension, springing into action against seizures, treating and preventing infection, making corrections in the patient's fluids loss and so forth. Timely communication between the healthcare teams providing and receiving the patients is of great importance in avoiding delays.

7.8.4 Precautions and Patient Education

It is very important that the pregnant women are given proper information about how important it is to go for sometimes necessary prenatal checkups, how one needs to follow the

recommendations in terms of vaccination and screening and how important the nutritional protocols and medications are. Women should also be made aware of the main alarming symptoms, such as: severe vaginal bleeding, belly pain, headache or vision problems, convulsions, fever, swelling, difficulties in breathing, fluid discharge and decreased fetal movements. Having medical records on hands and knowing the nearest medical institution will also help in case of the urgent need. In addition, self-medication should be avoided anytime; especially in cases when symptoms appear too difficult to understand. Medical advice must be obtained before taking any medications, herbal remedies or any medication whatsoever. Family members and caregivers have an important role to play in identify the signs of emergencies and seeking medical help. Emergency preparedness includes knowing who to call, where to go for treatment and when to request referral. Adequate counseling during the antenatal visits helps to cut down the delay in identifying a problem and getting treatment. Thus, emergency care in pregnancy encompasses prevention, identification and immediate stabilization, referral and integrated multidisciplinary management.

7.9 Role of Healthcare Team in Risk Management

As mentioned in (Table 3) Managing any risk during pregnancy appears to require collaboration between healthcare professionals when it comes to early detection of complications, monitoring the health of mother and child, providing treatment, and suggesting referrals when needed. Risky pregnancies may be subject to more frequent evaluation and monitoring compared to uncomplicated pregnancies. The coordinated effort from healthcare professionals reduces the chances of preventable complications and ensures continuity of care.

7.9.1 Risk Identification and Monitoring

Identification of risk factors at the early stage of pregnancy is critical for its management. A comprehensive history from the woman, including obstetric history in the form of the previous pregnancies and the problems that took place, past medical history, medications the woman has used, nutritional history, family medical history, and relevant social or environmental issues should be obtained by the caregivers as part of the routine antenatal assessment, that also consists of measuring the blood pressure and weight of the patient, symptoms exhibited, laboratory tests to monitor the fetal development and growth, and characteristics of the current pregnancy. Pregnant women suffering from health issues, including diabetes, high blood pressure, anaemia and those with previous obstetric problems and carrying more than one fetus should be monitored with special caution. At this stage, the monitoring should be personalized. Abnormalities should be identified, recorded and classified. Early identification of complications enables the specialists to respond timely to the evolving situation.

7.9.2 Multidisciplinary Care

Managing pregnancy at high-risk often involves working collaboratively with various health care providers. While obstetricians perform the evaluation and monitoring of complications during pregnancy, nurses and midwives provide assistance in conducting monitoring, performing medical work, providing patient education, and early detection of changes in maternal condition. Pharmacists also carry out functions, which include evaluating medications, spotting medication-related problems, providing advice regarding how to use medication when pregnant, and controlling side effects and interactions. Other specialists can be involved in accordance with the needs of the patient. Nutritionists provide personalized nutritional recommendations for conditions including anemia, gestational diabetes, and either being underweight or overweight. Laboratory workers help to facilitate speedy and accurate analysis procedures, whereas radiologists and ultrasound specialists help obtain fetal and maternal assessment in a proper way. In case the problem is complex, specialist doctors such as neonatologists, cardiologists, nephrologists, and infection disease specialists might be present. Good communication among team is crucial in order to achieve coordinated care. All clinical and laboratory findings as well as interventions and treatment strategies should be appropriately recorded and communicated. Team discussion is helpful in providing organization of care for a mother and child taking into account their specific needs.

7.9.3 Patient Counseling and Follow-Up

Patient counseling is an essential part of pregnancy risk management because informed patients are better able to recognize changes in their condition and seek care appropriately. Healthcare professionals should provide understandable information about the identified risk factors, prescribed medicines, nutrition, physical activity, antenatal investigations, vaccination, infection prevention, and other preventive measures. Women should also be educated about warning signs such as heavy vaginal bleeding, fluid leakage, severe abdominal pain, severe headache, visual disturbances, fever, seizures, breathing difficulty, and reduced fetal movements. Medication counseling is essential in high-risk pregnancies. Pregnant women must be knowledgeable about the significance of following medication formulas. They are advised against the cessation of medication, changing medication dosages, or starting a new medication, herb, or supplement without consulting a healthcare professional.. Pharmacists can facilitate adherence, explain the most common adverse effects of medications, inform patients of potential drug interactions, and encourage them to call the doctor as soon as they experience any alarming symptoms. Every follow-up visit must be customized depending on the risk posed to the newborn and mother. Consideration of pregnant women with complications, though, may need them to go to their doctor more than average. The doctor may need to run extra tests, keep monitoring the baby, and even refer the mother to a specialist. It is essential that the healthcare providers evaluate the outcome of treatment, any new symptoms, wellness of the mother, health

of the baby. Timely referrals and clear instructions are vital for detecting problems early and handling them.

Table 3: Roles of the Multidisciplinary Healthcare Team in High-Risk Pregnancy

Healthcare professional	Major role
Obstetrician	Assessment, monitoring and management of pregnancy complications
Nurse/Midwife	Maternal monitoring, patient care and health education
Pharmacist	Medication review, counselling and monitoring of adverse effects
Nutritionist	Individualized dietary and nutritional advice
Laboratory professional	Timely and accurate laboratory investigations
Radiologist/Ultrasound specialist	Maternal and fetal assessment
Other specialists	Management of complex maternal or fetal conditions
Healthcare team	Communication, documentation, coordinated care and timely referral

7.10 Conclusion

It is vital to recognize the risk factors of the fetus and the mother early in high-risk pregnancies, use monitoring, provide early treatment, and manage the healthcare system properly. Risks like gestational diabetes, hypertensive disorders, anemia, bleeding, and infection pose a serious risk to pregnant women's health and the health of their babies. Evaluating whether regular prenatal examinations are carried out and recognizing risks as early as possible are crucial points to guarantee the prevention of risk escalation. When going through the warning signs like bleeding, leaking, stomach pain, headache, vision problems, fever, swelling, dyspnea, or weak fetal movements, the patients need to be examined urgently. Effective risk management involves collaboration among specialties such as obstetricians, nurses, midwives, pharmacists, nutritionists, laboratory professionals, and others who may take part on an ad hoc basis. Counseling and follow-up provide patients with information about possible risks, compliance with treatment, and prompt medical consultation in case of alarm signs. In general, integrating preventive intervention, constant monitoring, education of patients, due referral, and evidence-based management can contribute significantly to a safer pregnancy process.

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