Pregnancy Complications

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COURSE OBJECTIVE: The purpose of this course is to provide nurses and other healthcare professionals with a review of the incidence, risk factors, signs/symptoms, medical management, nursing care, maternal/fetal implications, and relevant patient teaching related to the most common complications that affect women during the antepartum, intrapartum, and postpartum periods of pregnancy.

LEARNING OBJECTIVES
Upon completing this course, you will be able to:

• List the most common pregnancy complications.
• Describe the incidence and risk factors for the most common pregnancy complications.
• Identify signs and symptoms in women affected by pregnancy complications.
• Discuss the medical management and nursing care typically provided in response to pregnancy complications.
• Describe maternal and fetal implications arising from common pregnancy complications.
• Summarize relevant patient teaching offered to those experiencing pregnancy complications.

Pregnancy is one of the most profound times in a woman’s life. It is marked by a variety of physical changes, as well as by thoughts and feelings that sometimes overwhelm the mother-to-be. Though pregnancy is generally a time of joy and well-being, complications can occur that cloud the experience and put the woman and her unborn child at risk.
These complications include bleeding in early or late pregnancy, hyperemesis gravidarum, pregnancy-related hypertension, gestational diabetes mellitus, preterm rupture of membranes, and preterm labor and birth.

Nurses working in perinatal settings are in a unique position to screen, monitor, and provide care to patients who are affected by complications during pregnancy. It is essential for nurses to be familiar with these complications, as well as the maternal and fetal implications, medical treatment, and nursing care necessary to address these problems.

BLEEDING COMPLICATIONS: EARLY PREGNANCY

Spontaneous Abortion

Abortion describes the loss of pregnancy prior to fetal viability, which is typically defined as greater than 20 weeks’ gestation or fetal size greater than 500 grams. Abortion can be either spontaneous or induced. Spontaneous abortion, often called a miscarriage, occurs without intervention from the woman or another person.

TYPES

Spontaneous abortion affects 15%–20% of pregnancies (Katz, 2012). Spontaneous abortions can be caused by a number of factors, including chromosomal abnormalities, maternal infection, maternal endocrine disorders (e.g., hypothyroidism, uncontrolled diabetes), reproductive system abnormalities (e.g., an incompetent cervix), and maternal injury. Literature suggests that drug use and environmental factors may also be linked to the occurrence of spontaneous abortion. Spontaneous abortions are classified according to symptoms and the outcome of the products of conception. Spontaneous abortions are considered threatened, inevitable, incomplete, complete, missed, or recurrent.

Threatened abortions are diagnosed when there is vaginal bleeding and, possibly, uterine cramping. Women suffering from a threatened abortion may or may not lose the fetus. However, careful monitoring and appropriate intervention are necessary. Typically, patients are instructed to avoid sexual activity, tampons, and douches, as well as strenuous exercise. Patients are also encouraged to note and report bleeding to their healthcare practitioner.

Inevitable abortions occur when amniotic membranes rupture and the cervix dilates. In this case, abortion or miscarriage is considered inevitable. Patients typically have cramping. The products of conception are commonly expelled without intervention. However, a dilation and curettage (D&C) may be performed if necessary.

Incomplete abortions occur when some, but not all, of the products of conception are expelled from the uterus. The retained products prevent the uterus from contracting completely, which results in bleeding from uterine blood vessels. Patients generally experience severe cramping and profuse bleeding and receive intravenous (IV) fluids and possibly blood products. Generally, a
D&C is performed to remove the retained products of conception. Additionally, patients may receive medications such as oxytocin (Pitocin) or methylergonovine (Methergine) to contract the uterus and stop the bleeding.

**Complete abortions** occur when all of the products of conception, including the fetus and placenta, are expelled from the uterus. The cervix closes and cramping and bleeding stop. Further intervention is typically not necessary. However, the patient is advised to notify her healthcare practitioner of any additional bleeding, pain, or symptoms of infection, such as fever or foul-smelling vaginal discharge.

**Missed abortions** occur when the fetus expires during the first half of pregnancy but is retained in the uterus. If there are no obvious signs of infection present, the patient may carry the fetus until spontaneous expulsion occurs. This may take several weeks. However, a D&C may be performed.

The term **recurrent (or habitual) spontaneous abortion** refers to three or more consecutive spontaneous abortions. It is believed that genetic defects and reproductive system abnormalities are the primary causes of recurrent abortions. Patients are screened and examined for reproductive system abnormalities, such as recurrent premature dilation of the cervix, also known as *incompetent cervix*. In the case of the premature dilation of the cervix, a suturing procedure known as a *cerclage* may be performed to prevent the cervix from opening until delivery.

Reproductive system abnormalities may prevent the successful implantation and growth of the ovum. If the reproductive system is found to be normal, genetic screening is performed. Treatment of recurrent spontaneous abortion is based on the causative factor.

**GENETIC INFLUENCE OF THE FATHER**

Slama and colleagues (2005) studied 5,121 California women who were less than 13 weeks’ gestation to determine the relationship between paternal age and spontaneous abortion, as chromosomal anomalies in spermatozoa appear to increase with paternal age (more specifically, fathers greater than 35 years old). They found that “the risk of spontaneous abortion increased with increasing paternal age [and] . . . that the association is stronger for first trimester losses.” Kleinhaus and colleagues (2006) conducted a similar study with 13,865 women and concluded that “increasing paternal age is significantly associated with spontaneous abortion, independent of maternal age and multiple other factors.”

**NURSING CARE**

Nursing care for patients experiencing a spontaneous abortion varies depending on the type of abortion. However, the primary nursing intervention for all types of spontaneous abortion is to ensure patient safety by identifying and controlling bleeding and hypovolemic shock. Symptoms of hypovolemic shock include an increased heart rate, decreased blood pressure, cool and clammy skin, lightheadedness, and confusion. The nurse should anticipate the need for oxygen therapy and fluid and blood replacement. The nurse may also be responsible for administering
medications; for example, oxytocin (Pitocin) may be used to help in expelling the products of conception or to control bleeding. Patients should be blood-typed and cross-matched in case a blood transfusion is necessary.

The nurse monitors vital signs, oxygen saturation, intake and output, and laboratory results according to institutional policies. If a patient experiences a threatened abortion but the fetus does not die, the nurse may be responsible for monitoring fetal heart sounds and the overall well-being of the fetus depending on gestational age. The nurse should administer prescribed Rh(D) Immune Globulin (human) (RhoGAM) to Rh-negative patients within 72 hours to prevent isoimmunization.

The nurse caring for a patient experiencing spontaneous abortion will also need to help the patient explore her feelings regarding an actual or potential loss. Many patients feel that their actions somehow led to the spontaneous abortion; therefore, feelings of guilt are often significant emotional challenges that many patients must deal with while grieving their loss.

Similarly, women who suffer from a threatened abortion and do not lose the fetus are often afraid that they may still lose the fetus and remain stressed throughout the remainder of the pregnancy. This affects not only the patient but also her family, and the nurse should do everything possible to assist the patient and her family during this time.

**COMPLICATIONS OF MISSED ABORTIONS**

Two serious complications of missed abortions are infection and disseminated intravascular coagulation (DIC). **Infection** can occur as a result of carrying an expired fetus and is a serious health threat to these patients.

**DIC** occurs when there is an over-activation of the clotting process in the body. Specifically, the body produces excessive amounts of thrombin in attempts to control bleeding. This stimulates the conversion of fibrinogen to fibrin. As a result, clots form in blood vessels throughout the body and prevent blood flow to vital organs. Clotting factors are heavily consumed during this process and generalized hemorrhage occurs.

Essentially, DIC produces clotting, bleeding, and ischemia that occur simultaneously. Symptoms include shortness of breath, chest pain, and/or cyanosis that occur suddenly. Bleeding from the nose, gums, and IV sites, as well as petechiae, also occur in the presence of DIC. Treatment is aimed at delivering the fetus and placenta, which will stop the over-activation of the clotting process. Patients are treated with oxygen therapy and are usually given blood products.

**PATIENT TEACHING**

Nurses are responsible for ensuring that patients are adequately prepared to care for themselves upon discharge from the hospital following treatment or monitoring for a spontaneous abortion. It is important that patients understand the warning signs of further complications and the importance of reporting such signs to their healthcare practitioner.
Warning signs include fever, foul-smelling vaginal discharge, significant bright red vaginal bleeding, and pelvic pain. In addition, patients are encouraged to avoid sexual activity, tampons, or douches. Experiencing a spontaneous abortion is challenging for women both physically and emotionally, and they need to rest for a few days after discharge. They may be required to take iron supplements as a result of significant blood loss and/or antibiotics to treat or prevent infection. Foods such as liver, green leafy vegetables, dried foods, and eggs provide needed iron. Additional fluid intake is recommended.

It is important that the nurse recognize and acknowledge the patient’s loss or threatened loss. The patient needs to understand that it is normal for her to go through a grieving process and that she may grieve for six months to one year (Murray et al., 2013). The patient should also be provided with appropriate community referrals for counseling and/or support groups. She may be eager to become pregnant again if she loses the fetus; however, she should be encouraged to allow her body to rest and recover before attempting another pregnancy and to discuss with her healthcare practitioner when the appropriate time to conceive would be.

**CASE**

Rihanna is 29 years old and pregnant for the fifth time. Her first pregnancy resulted in birth at 34 weeks’ gestation and produced her only living child. She had three spontaneous abortions at 12 weeks, 14 weeks, and 18 weeks. Rihanna is currently at 12 weeks’ gestation and is at the clinic for her first prenatal checkup. She was seen crying quietly in the waiting room and later states, “My mother-in-law says that if I weren’t such a weak person, I would not keep losing my babies.”

**Discussion**

Rihanna had three consecutive spontaneous abortions, which indicates that she has a history of recurrent or habitual spontaneous abortion. She is at a stage of pregnancy where her healthcare practitioner might discuss causative factors, such as an incompetent cervix or genetic disorder. It is important that Rihanna understand that her behavior did not cause the numerous spontaneous abortions. Rihanna should be given support and encouragement throughout her pregnancy. (Case study courtesy of Sharon Walker, RN, MSN.)

**Ectopic Pregnancy**

Ectopic pregnancies occur when the ovum is fertilized by the sperm but implants outside the uterus in the fallopian tubes, cervix, ovary, or abdominal cavity. Most ectopic pregnancies occur in the fallopian tubes.
Possible implantation sites for ectopic pregnancies. (Illustration courtesy of Sim London, Jr.)

**INCIDENCE AND RISK FACTORS**

The overall incidence of ectopic pregnancy in the United States increased during the mid twentieth century, plateauing at 19.7 per 1000 pregnancies in the early 1990s, the last time national data were reported (CDC, 1995). Ectopic pregnancies are caused by a variety of factors, which include anything that would prevent or slow the fertilized ovum’s journey to the lining of the uterus. More specifically, anything that causes scarring in or blocks the fallopian tubes may cause an ectopic pregnancy.

Patients who are of advanced maternal age or have reproductive system anomalies, repeated induced abortions, a history of tubal surgery, sexual transmitted infections (STIs), pelvic inflammatory disease, intrauterine devices (IUD), or a history of ART (assistive reproductive technology) procedures are at risk for having an ectopic pregnancy (Hoover et al., 2010). The literature also suggests that women who douche regularly or smoke have a higher risk of an ectopic pregnancy.

**SIGNS AND SYMPTOMS**

Signs and symptoms of an ectopic pregnancy include vaginal bleeding, lack of menstruation (amenorrhea), and abdominal pain. However, other disease processes (e.g., spontaneous
abortion) may be responsible for such symptoms. Ultrasound and laboratory testing are necessary to diagnose an ectopic pregnancy.

The outcome of an ectopic pregnancy depends on the location of implantation. The ovum may naturally reabsorb into the body, or the structure supporting the ovum may rupture. If the implantation site is a fallopian tube, the tube may rupture and cause internal hemorrhaging and hypovolemic shock, which is a life-threatening event for the patient.

Signs and symptoms of a ruptured fallopian tube include vaginal bleeding; severe abdominal pain or pelvic, shoulder, or neck pain (as a result of blood leaking out of the fallopian tube and irritating the diaphragm); weakness; dizziness; decreased blood pressure; and increased pulse. It is important to note that many patients experiencing an ectopic pregnancy are asymptomatic prior to tubal rupture.

**MEDICAL MANAGEMENT**

An ectopic pregnancy implanted in a fallopian tube requires either pharmacologic or surgical management. Pharmacologic management with methotrexate is indicated if the tube is unruptured, the ectopic pregnancy is less than 3.5 cm, the fetus is not living, and the patient is stable hemodynamically. Often, patients require more than one dose of methotrexate for effective treatment. Methotrexate treatment is usually performed on an outpatient basis.

If the fallopian tube is ruptured as a result of an ectopic pregnancy and the patient wants to become pregnant in the future, a surgical procedure called a **linear salpingostomy** is performed to protect the tube. A linear salpingostomy requires a small linear incision in the tube to remove the products of conception. The tube is then allowed to heal without suturing to prevent significant scarring. Significant scarring in the fallopian tube could potentially affect the ability of the patient to have a successful pregnancy in the future. If the tube is ruptured and the patient does not desire a future pregnancy, a **laparoscopic salpingectomy** is performed. This procedure involves the actual removal of the affected fallopian tube.

**NURSING CARE**

The nurse caring for a patient experiencing an ectopic pregnancy looks for changes in the patient’s blood pressure and pulse, which could indicate hypovolemic shock resulting from hemorrhage. Regular assessment of vaginal bleeding is also essential. Rh-negative patients require administration of prescribed RhoGAM to prevent isoimmunization. Finally, the nurse is responsible for monitoring and controlling pain levels.

If a linear salpingostomy or salpingectomy is performed, the nurse monitors vital signs, oxygen saturation, intake and output, and laboratory results according to institutional policies. As with all patients experiencing a pregnancy loss, it is important for the nurse to recognize the loss and to provide resources to assist the patient in coping with the emotions that accompany the experience of an ectopic pregnancy.
PATIENT TEACHING

Nurses are responsible for ensuring that the patient is aware of signs and symptoms that require a call to the healthcare practitioner or a return visit to the emergency room following hospital discharge. More specifically, if the patient experiences pain, significant bleeding, or a fever and chills, she needs to notify her healthcare practitioner. The patient should have a clear understanding of the feelings of anger, sadness, or guilt that may arise following an ectopic pregnancy and that these feelings are a normal part of the grieving process for someone experiencing the loss of a pregnancy.

If methotrexate is used for the treatment of an ectopic pregnancy, the patient should be educated about the unpleasant side effects (nausea and vomiting) and told to avoid alcohol as well as foods and vitamins containing folic acid, which can decrease the effectiveness of the medication.

CASE

Cora is a 42-year-old newlywed. She comes into the Women’s Health Clinic complaining of vaginal bleeding and abdominal pain that is completely unlike her usual monthly cramping. She describes her pain as “very sharp” and an “11” on a scale of 0–10. Her vital signs are temperature 98.8 °F, pulse 102, respiration 24, and blood pressure 102/64. She indicates that her blood pressure is “usually 130/90.” She is unable to recall the date of her last menstrual period. Additionally, she has almost soaked an entire pad in the last hour.

Cora is very anxious and says, “I’ve never had any real female problems before, except for the little cramping I get on the first day of my period. I shouldn’t be having this difficulty because I keep my female parts very clean by douching weekly.” She sheepishly admits to having “the clap” five years ago.

Discussion

Cora should be assessed for an ectopic pregnancy. Her risk factors include: advanced maternal age, regular douching, and a history of an STI. She is bleeding heavily and showing evidence of hypovolemia. The priority in this situation is to ensure patient safety by obtaining and sustaining hemodynamic stability. (Case study courtesy of Sharon Walker, RN, MSN.)

Gestational Trophoblastic Disease (GTD)

Gestational trophoblastic disease, also known as a hydatiform mole or a molar pregnancy, occurs when the chorionic villi of the placenta increase as a result of genetic abnormalities. The villi swell, forming fluid-filled sacs, which appear as tiny clusters of grapes within the uterus. Molar pregnancies are classified as complete or partial based on whether a fetus is present. A partial mole occurs when a fetus or an amniotic sac is present, whereas a complete mole only contains the fluid-filled sacs. The fetus is usually nonviable in a molar pregnancy. However, according to Dente (2007), although it is uncommon, “twinning” has been reported with a complete [mole] plus a surviving fetus with a normal placenta.”
INCIDENCE AND RISK FACTORS

GTD pregnancies are rare and occur in approximately 1 in 1,500 pregnancies in the United States and Europe (Murray et al., 2013). Patients of advanced maternal age and of Asian descent have a higher risk of having a molar pregnancy. Additionally, patients who experienced a previous molar pregnancy have a higher risk of having a molar pregnancy in the future.

SIGNS AND SYMPTOMS

Patients with a GTD exhibit light to heavy bleeding and even hemorrhage. Bleeding can be bright red or brown, appearing similar to prune juice. Anemia may result due to bleeding. Additionally, as a result of the proliferation of tissues and the presence of clotted blood, the uterus may appear larger than expected for gestational age. Despite an enlarged uterus, fetal heart tones and movement are absent. Serum hCG levels are also increased and patients may experience hyperemesis. Symptoms of gestational hypertension before 24 weeks’ gestation are a strong indication of gestational trophoblastic disease.

MEDICAL MANAGEMENT

Molar tissues are removed by vacuum aspiration. Intravenous oxytocin is usually administered to contract the uterus after the vacuum aspiration. It is important to note that oxytocin should not be administered prior to vacuum aspiration to avoid tissue being forced into venous circulation and subsequent embolization (Murray et al., 2013). Gentle curettage, or scraping of the uterus, is performed to ensure that the uterus is emptied of all affected tissue.

Patients are followed for one year after removal of a molar pregnancy to detect choriocarcinoma, or cancer associated with GTD. If serum hCG levels do not return to pre-pregnancy levels, there is a possibility that choriocarcinoma may be present and further investigation is necessary. Therefore, it is essential that patients understand the need for follow-up.

NURSING CARE

It is vital that the nurse monitoring patients experiencing molar pregnancies assess for signs and symptoms of bleeding and shock, including changes in heart rate, blood pressure, and urinary output. If a patient has hyperemesis resulting from the molar pregnancy, the nurse should assist the patient with mouth care and any additional interventions that are appropriate. Nursing care also includes pre- and postoperative care. Laboratory work, including a complete blood count, blood-typing and cross-matching, and serum hCG levels is required prior to vacuum aspiration and curettage.

Rh-negative patients should receive RhoGAM to prevent isoimmunization. As with all pregnancy losses, patients may exhibit grief in response to the loss. Patients should be informed that this is a normal response to a pregnancy loss; therefore, nursing care includes referring patients to appropriate providers or support groups as needed.
PATIENT TEACHING

Due to the risk of choriocarcinoma, it is vital that patients understand the need for regular follow-up to test serum hCG levels. Patients should also understand that another pregnancy immediately following a molar pregnancy should be avoided in order to monitor hCG levels without the interference of hCG from pregnancy. It is important that patients are aware of the signs and symptoms of complications following a molar pregnancy and vacuum aspiration, including excessive bleeding, foul-smelling vaginal discharge, and fever.

Patients should avoid tampons, douches, and sexual activity until the healthcare practitioner indicates that these activities can be performed safely. As a result of bleeding, patients may be anemic and require increased iron intake or possibly iron supplementation. Foods such as liver, green leafy vegetables, dried foods, and eggs can provide needed iron. The patient should also be encouraged to increase fluid intake.

CASE

Jill is a 40-year-old prima gravida of Asian descent. The date of her last menstrual period (LMP) places her at 22 weeks’ gestation, although her fundal height is consistent with 26 weeks’ gestation. She indicates that throughout the pregnancy she had periodic spotting that resembles prune juice. Jill states: “I knew pregnancy would be difficult at my age in spite of what my grandmother says, but I am vomiting so much that my weight is down to 102 pounds. My pressure is up a little but I guess that’s because of my age, too.”

Jill’s records indicate that her weight at the initial prenatal visit was 110 pounds. Her vital signs are temperature 98.6 °F, pulse 86, respirations 20, and blood pressure 142/90, but fetal heart tones and movement are not detected. She has a small emesis of undigested food while sitting in the waiting room. She states, “It gets harder and harder to keep working in our restaurant.”

Discussion

Jill should be assessed for a gestational trophoblastic disease. She has several risk factors and indications for this condition. She is of advanced maternal age and of Asian descent; she is having light bleeding, hyperemesis, and hypertension; and her uterus is larger than expected for gestational age. Following her diagnosis, the nurse may need to address with Jill the loss of her pregnancy and the necessity for follow-up cancer screening. (Case study courtesy of Sharon Walker, RN, MSN.)

BLEEDING COMPLICATIONS: LATE PREGNANCY

Placenta Previa

Placenta previa occurs when the placenta implants in the lower portion of the uterus by the internal cervical os. Previas are classified according to the degree to which they cover the os.
Specifically, if the lower border of the placenta is close to, but does not quite reach, the internal cervical os, the previa is considered marginal. If the placenta partly covers the internal os, the previa is considered a partial placenta previa. The previa is considered a total previa if the placenta completely covers the internal cervical os (see illustration). As the pregnancy nears term and the cervix dilates, the placenta implanted near or over the internal cervical os is disrupted and bleeding can occur. The bleeding places the patient and her unborn child at risk.

Placenta previa. (Illustration courtesy of Sim London Jr.)

INCIDENCE AND RISK FACTORS

The most recent systematic review of placenta previa found that prevalence ranged from 3.5 to 4.6 per 1,000 births (Faiz & Ananth, 2003). There are several factors that place patients at risk for a placenta previa:

- Advanced maternal age
- Cesarean section
- Smoking or drug use (e.g., cocaine)
- Previous placenta previa
- Uterine scarring (e.g., endometriosis)
- Induced or spontaneous abortion

SIGNS AND SYMPTOMS

The most significantly recognized symptom of placenta previa is painless, bright red vaginal bleeding or hemorrhage during late pregnancy. It is imperative that vaginal examinations be
avoided because stimulation of the placenta may cause hemorrhage. However, bleeding may not occur until labor begins.

**MATERNAL AND FETAL IMPLICATIONS**

As a result of the abnormally implanted placenta, the fetus is often in a transverse or breech position, which may be noted during fundal examination. The fetus may also experience hypoxia and possibly death from maternal bleeding. The patient may go into shock as a result of hemorrhage.

**MEDICAL MANAGEMENT**

As previously mentioned, vaginal examination must be avoided if a patient presents with painless, bright red vaginal bleeding because hemorrhage may occur. A transabdominal ultrasound can be performed to diagnose the previa. Medical management of a placenta previa is largely determined by gestational age, fetal status, amount of bleeding, and type of previa. Some patients may deliver vaginally if they are near term, the cervix is ripe, the fetal heart tracing does not show fetal compromise, and there is minimal bleeding. However, if heart tracings indicate fetal compromise, significant bleeding, or hemorrhage, or a complete previa is present, a cesarean section is usually necessary.

**NURSING CARE**

Nursing care for patients with a placenta previa involves close monitoring of bleeding as well as fetal and maternal status. Significant bleeding or hemorrhage should be reported immediately to the appropriate healthcare provider. Regular assessment of fetal heart rate and movement is necessary. Heart rate patterns that indicate fetal compromise should be reported to the healthcare practitioner immediately. Careful monitoring of bleeding is imperative, as vital sign changes may not be initially evident.

Patients with a placenta previa should remain on bed rest. Non-stress testing to evaluate fetal status is performed during bleeding episodes, while intermittent fetal heart tones are obtained according to medical orders or institutional policy. Patients should be blood-typed and cross-matched in case a blood transfusion is necessary. Intravenous access should be maintained for prompt administration of fluids or blood products.

A Kleihauer-Betke test is usually performed on Rh-negative patients to determine if the fetal blood has entered the maternal circulation as a result of fetal-maternal hemorrhage. RhoGAM is given to Rh-negative patients during each bleeding episode to prevent isoimmunization.

**PATIENT TEACHING**

It is extremely important that patients with a placenta previa understand the need to maintain bed rest to prevent unnecessary pressure on the internal cervical area where the placenta is implanted.
In addition, patients should be instructed to maintain pelvic rest by abstaining from sexual intercourse or using tampons or douches. Encourage the patient to prohibit vaginal examinations.

**CASE**

Megan, a 39-year-old woman, comes into the emergency department. She is in the 37th week of her fourth pregnancy. She has a history of two elective abortions. A moderate amount of bright red vaginal blood is noted. Megan is crying loudly and asking for someone to call her husband. She states, “I don’t understand why I’m bleeding! Nothing hurts at all. I have changed all the bad things in my life. I’ve stopped smoking and using coke. I really, really want this baby.” The fetal heart tones and movement are regular and strong.

**Discussion**

Megan will be assessed for placenta previa. She has the following risk factors: history of smoking, drug use, and multiple induced abortions. Her current symptom of painless, bright red bleeding is indicative of the condition. No vaginal examination will be performed and fetal assessment will continue. Megan can expect to be on bed rest and may be hospitalized for continued evaluation and fetal surveillance.

(Case study courtesy of Sharon Walker, RN, MSN.)

**Abruptio Placentae**

Abruptio placentae, often referred to as an *abruption* or *placenta abruption*, is the premature separation of the normally implanted placenta from the uterine wall before labor and delivery of the newborn. Bleeding occurs between the uterine wall and the placenta.

Abruptio placentae is classified according to the degree of placental separation and subsequent hemorrhage. An abruption can be partial or complete, with apparent or concealed hemorrhage (see illustrations). An abruption is partial if a section of the placenta separates from the uterine wall but the margins of the placenta remain intact. A complete abruption occurs when the entire placenta detaches from the uterine wall. Apparent hemorrhage refers to bleeding that is evident, while a concealed hemorrhage denotes bleeding that is obscured.
Abnormalities of the Placenta in Pregnancy

INCIDENCE AND RISK FACTORS

Abruptio placentae occurs in 1 in 200 deliveries (Cunningham et al., 2009). Aside from abruptions occurring as a result of trauma, the cause of abruptio placentae is largely unknown. However, there are several factors that place patients at risk for an abruption.

- Drug use (e.g., cocaine)
- Alcohol abuse
- Cigarette smoking
- Hypertension
- Diabetes mellitus
- Advanced maternal age
- Multiparity and multiple pregnancy
- History of abruptio placentae
- Thromboembolic disorders
- Premature rupture of membranes (PROM)
- Abdominal trauma (e.g., accident, violence)

SIGNS AND SYMPTOMS

The classic signs and symptoms of abruptio placentae include vaginal bleeding, which may be dark red due to old blood from a concealed abruption; uterine tenderness; and a board-like abdomen. Patients often complain of an aching or dull pain in the abdomen or lower back. Additionally, uterine irritability with poor uterine resting tone is frequently noted.
MATERNAL AND FETAL IMPLICATIONS

Abruptio placentae is a life-threatening event for the patient and the fetus. Patients with an abruption are at risk for developing hypovolemic shock, disseminated intravascular coagulation (DIC), and possibly death. Patients may also suffer from postpartum hemorrhage after delivery due to poor contractility of the uterus following an abruption. Since the placenta is the source of oxygenation for the unborn fetus, premature separation of the placenta from the uterine wall can place the fetus at great risk for hypoxia and death.

MEDICAL TREATMENT

Abruptio placentae is usually diagnosed by abdominal ultrasound in addition to the presenting signs and symptoms. Treatment is based on the degree of placental separation and subsequent hemorrhage as well as the status of the patient and fetus. In the presence of severe abruption and hemorrhage, emergency cesarean section is performed, unless delivery is imminent.

NURSING CARE

Although vaginal delivery is preferred to cesarean section for patients who are hemodynamically stable, the nurse must be prepared to deal with the possibility of severe hemorrhage and hypovolemic shock, as well as the resulting fetal distress. Patients should have intravenous access with a large-bore catheter to accommodate the administration of fluid and blood products.

It is necessary to monitor carefully the status of the patient and fetus. Frequent vital signs and fetal heart tones, as well as monitoring and documentation of blood loss, is essential. Abnormal vital signs, bleeding, or fetal heart patterns indicating fetal compromise should be reported immediately to the appropriate healthcare provider. Observation and documentation of the patient’s intake and output and pain and comfort levels are also essential. Patients should be blood-typed and cross-matched in case a blood transfusion is necessary. RhoGAM is indicated for Rh-negative patients.

Because the potential for patient and fetal injury is high in the presence of abruptio placentae, it is important to address the emotional needs of the patient. Patients should be kept informed of the status of the fetus, and the nurse should be available and ready to answer any questions that patients or their families may have.

PATIENT TEACHING

Patients should be instructed to report bleeding and severe abdominal pain immediately. It is important to inform patients with abruptio placentae that emergency delivery may be necessary. If a patient must have an emergency cesarean section, it is important for the nurse to quickly communicate to the patient and her family what will occur before and during the procedure. Nurses should remember that hemorrhage and emergency surgery can be very frightening; therefore, clear and honest information must be given to the patient and her family as frequently as possible.
CASE

Rebecca has her first prenatal visit at 30 weeks’ gestation. She is extremely quiet, holds her head down, and stays very close to her husband, speaking in whispers only to him. Rebecca’s husband then repeats her comments and questions to the nurse and clinic staff. Her uterine height and the fetal heart tones are all within normal limits. However, you observe multiple bruises in various stages of healing on her torso and legs and a moderate amount of dark vaginal blood on her peri-pad. Although Rebecca (through her husband) denies any pain, she is sweating profusely and seems to have abdominal pain.

Discussion

The presence of bruises at various stages of healing and Rebecca’s dependence on her partner to answer for her are indications that she appears to be a victim of intimate partner violence (IPV). There is also a possibility of abruptio placentae related to abdominal trauma. The patient has dark red vaginal bleeding and evidence of abdominal pain. It is important for the healthcare practitioner to speak with Rebecca in private to discern the cause of her bruising and possible abuse. In addition, the nurse must ensure the safety of the patient and her unborn child. (Case study courtesy of Sharon Walker, RN, MSN.)

PLACENTA PREVIA VERSUS ABRUPTIO PLACENTAE

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Placenta Previa</th>
<th>Abruptio Placentae</th>
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</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Painless</td>
<td>Uterine tenderness; severe abdominal pain and possibly aching or dull pain in the lower back</td>
</tr>
<tr>
<td>Bleeding</td>
<td>Bright red</td>
<td>May be concealed; if noted, it is often dark red</td>
</tr>
<tr>
<td>Uterus</td>
<td>No unusual contractions or irritability</td>
<td>“Board-like” abdomen; uterine irritability with poor resting tone</td>
</tr>
<tr>
<td>Risk for postpartum hemorrhage</td>
<td>High risk; due to low placement of the placenta, there is limited uterine contraction</td>
<td>High risk due to poor contractility of the uterus following an abruption</td>
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HYPEREMESIS GRAVIDARUM

Nausea and vomiting occur normally during pregnancy. However, nausea and vomiting that persists beyond the 20th week of gestation and interferes with the intake of food and fluid as well as adequate weight gain during pregnancy is termed hyperemesis gravidarum. The cause of hyperemesis is unknown, however elevated hormonal levels and relaxation of smooth muscle resulting in delayed stomach emptying, along with stress, are believed to play a part in this disorder.
Incidence

Hyperemesis gravidarum affects approximately 0.3% to 2% of pregnancies (Goodwin, 2008). Depending on the severity of the condition, patients suffering from hyperemesis may be hospitalized or admitted to home-care services for monitoring.

Signs and Symptoms

Normal first-trimester nausea and vomiting can be challenging for pregnant women. However, patients with hyperemesis gravidarum are frequently debilitated by unrelenting vomiting and dry retching. Common signs and symptoms of hyperemesis gravidarum include:

- Poor appetite
- Poor nutritional intake
- Vomiting beyond 20 weeks’ gestation
- Significant weight loss (>5% of pre-pregnancy weight)
- Dehydration (dry mouth and mucous membranes, decreased skin elasticity [turgor], and dark, concentrated urine)

Maternal and Fetal Implications

Patients with hyperemesis gravidarum frequently become dehydrated and may have metabolic acidosis as a result of starvation. In addition, patients may become alkalotic from a loss of hydrochloric acid during vomiting. Electrolyte imbalances such as hypokalemia and vitamin deficiencies are also common in patients with hyperemesis gravidarum. Ultimately, long-term nausea and vomiting can cause renal and/or gastrointestinal impairment in the pregnant patient.

Dehydration occurring from hyperemesis gravidarum may result in preterm labor, which can negatively impact the fetus. In addition, dehydration impairs placental perfusion and affects nutrient intake and oxygenation of the fetus. Moreover, due to the severe nausea and vomiting associated with hyperemesis, poor maternal nutrient intake is common and fetal growth may be compromised, causing low-birth-weight infants.

Medical Treatment

When diagnosing hyperemesis gravidarum, it is important to investigate the underlying causes of nausea and vomiting. These causes can include gastroenteritis, pancreatitis, hepatitis, peptic ulcer disease, and pyelonephritis. Patients usually require intravenous fluids and antiemetics to manage hyperemesis. While most care for hyperemesis is provided in the patient’s home, some patients may require hospitalization for nutritional support via enteral or parenteral access.
ACUPRESSURE AND ACUPUNCTURE

Research studies have examined the effectiveness of acupuncture and acupressure on nausea and vomiting during pregnancy. Although there are differing opinions about the effectiveness of these therapies, several studies indicate that acupuncture and acupressure are effective modalities for the treatment of nausea and vomiting during early pregnancy (Olds et al., 2012; Steele et al., 2001; Smith & Cochrane, 2009).

Nursing Care

The nurse caring for patients with hyperemesis gravidarum monitors and provides physical care as well as psychosocial support to patients. The nurse will administer intravenous fluids and antiemetics. Intake and output are carefully monitored, as well as gastrointestinal status. Laboratory results (e.g., ketones, electrolytes, complete blood count, liver enzymes) should be carefully monitored, with abnormal results reported to the appropriate healthcare practitioner. It is important to monitor for weight loss. The constant, prolonged nausea and vomiting associated with hyperemesis may easily result in malnutrition for pregnant patients. Often patients are unable to work or tend to activities of daily living. This underscores the need for the nurse to address the psychosocial needs of patients, which may involve simply listening to the patient or a referral to appropriate resources.

CASE

Deanna is in the 10th week of her first pregnancy. She has come to the second prenatal visit stating she has many questions: “I thought you got bigger when you have a baby. I started out weighing 130 pounds, and on your scale I now weigh 121. Is it because of all the barfing?”

Deanna describes vomiting 4 to 6 times per day: in the morning as soon as she gets out of bed, sometimes after eating lunch, and after eating dinner. “If I’m not actually barfing, I can’t look at food because I feel like I will. My mom said its normal to have morning sickness, but it’s not called ‘all-day sickness,’ is it?”

Deanna’s urine is amber-colored. She has poor skin turgor, flaking skin over much of her body, and sticky mucous membranes. “My husband is really beginning to complain about my not cooking anything. But really, if I smell any food, everything I’ve eaten comes up. I spew like a volcano. My husband has taken to calling me Mt. Vesuvius.”

Discussion

Deanna should be assessed further for hyperemesis gravidarum. She has decreased turgor, dry skin, and sticky mucous membranes. Deanna reports constant nausea and frequent vomiting. Her weight loss is more than 5% of her pre-pregnancy weight, and her urine is concentrated. The nurse should work with Deanna on interventions for improving her intake and curtailting the symptoms of hyperemesis. (Case study courtesy of Sharon Walker, RN, MSN.)
Patient Teaching

Most of the nursing care provided to patients with hyperemesis gravidarum involves teaching the patient to deal with the associated nausea and vomiting. It is important for patients to understand the need to eat small, frequent low-fat meals throughout the day. Usually toast, dry cereal, and other bland foods such as bananas, rice, and apples are well tolerated. Patients should be instructed to identify and avoid foods and odors that trigger nausea and vomiting. In addition, patients should be encouraged to maintain adequate fluid intake to prevent dehydration.

Since constant, prolonged vomiting affects the patient’s mouth and desire to eat, nurses can teach and encourage patients to provide and maintain adequate oral care. Positive ketones in the urine indicate that patients are using fat stores to provide energy to themselves and their growing fetuses. Therefore, patients may be required to use urine dipsticks to monitor ketones while at home. The nurse will need to instruct patients in the appropriate use of the urine dipsticks.

Nurses should instruct patients to notify their healthcare practitioner if they notice dark urine, bloody vomitus, abdominal pain, dehydration, lack of urine output for 8 hours, or inability to keep food down for 24 hours.

PREGNANCY-RELATED HYPERTENSIVE COMPLICATIONS

**Gestational hypertension**, formerly known as *pregnancy-induced hypertension*, refers to hypertension occurring for the first time during pregnancy. Diagnosis of gestational hypertension requires a blood pressure that is greater than or equal to 140/90 mm Hg. The blood pressure should be elevated on at least two occasions 4–6 hours apart. The diagnosis is made after 20 weeks’ gestation and is characterized by a blood pressure that returns to normal by 12 weeks postpartum. Patients with gestational hypertension do not present with proteinuria, which is a characteristic of preeclampsia. However, gestational hypertension may progress to preeclampsia. If gestational hypertension does not progress to preeclampsia, it is reclassified as transient hypertension.

**Preeclampsia** is identified by a blood pressure that is greater than or equal to 140/90 mm Hg in the presence of protein in the urine (proteinuria). Preeclampsia is indicated when there is a finding of 300 mg of protein in a 24-hour urine test or 1–2+ protein or greater via urine dipstick.

**Eclampsia** is the occurrence of seizures in the presence of preeclampsia. Usually, seizures are related to gestational hypertension and not to other causes. Seizures can occur anytime before, during, or after delivery of the fetus.

**Preeclampsia superimposed on chronic hypertension** refers to chronic hypertension with a new onset of proteinuria in hypertensive patients without proteinuria before 20 weeks’ gestation or a sudden increase in proteinuria or blood pressure, or a platelet count less than 100,000 mm$^3$ in patients with hypertension and proteinuria before 20 weeks’ gestation (Murray et al., 2010). Medical treatment and nursing care for patients with preeclampsia superimposed on chronic hypertension is similar to that of gestational hypertension and preeclampsia. Patients with
Preeclampsia superimposed on chronic hypertension are often treated with antihypertensive agents.

**Incidence and Risk Factors**

According to the National Vital Statistics Reports (2011), 4% (41.2 of 1,000) of pregnancies were affected by pregnancy-related hypertensive complications in 2009. Additionally, pregnancy-related hypertension is a significant contributor to maternal and fetal mortality rates. Carson (2012) indicates that gestational hypertension occurs in approximately 2%–3% of pregnancies in the United States. Primigravidas, African Americans, diabetics, patients of either young or advanced maternal age, and patients pregnant with multiples are at a greater risk for developing pregnancy-related hypertension. A family history of pregnancy-related hypertension is also a significant risk factor.

**HYPERTENSION AND SNORING**

O’Brien and colleagues (2012) conducted a research study and found that:

> Of 1,719 pregnant women, 34% reported snoring, with 25% reporting pregnancy-onset snoring. . . . New-onset snoring during pregnancy is a strong risk factor for gestational hypertension and preeclampsia. In view of the significant morbidity and healthcare costs associated with hypertensive diseases of pregnancy, simple screening of pregnant women may have clinical utility.

Furthermore, Vankata and Venkateshiah (2009) indicate that “obstructive sleep apnea has been associated with an increased risk of hypertension among the general population, and this raises the possibility of its association with gestational hypertension and preeclampsia.”

**Pathophysiology**

Vasospasm in the arterioles of patients with gestational hypertension causes increased blood pressure and a decrease in placenta and uterine perfusion. Renal blood flow is reduced, along with the renal glomerular filtration rate, which produces proteinuria. Headaches and visual disturbances are the result of cellular damage and cerebral edema caused by central nervous system changes in the presence of hypertension. Liver enlargement is the result of hepatic changes that lead to epigastric pain. Generalized vasospasm causes endothelial cell damage, which triggers coagulation pathways, and subsequently, abnormalities in bleeding and clotting can occur.

**Signs and Symptoms**

Signs and symptoms of pregnancy-related hypertension vary depending on the severity of the hypertension. However, the common signs and symptoms of pregnancy-related hypertension include headache, blurred vision, epigastric pain, weight gain (>2 pounds per week), oliguria,
and proteinuria. Although no longer considered diagnostic of pregnancy-related hypertension, edema may still be noted in these patients (Cunningham et al., 2009).

**Maternal and Fetal Implications**

Hypertension in pregnancy places patients and their fetuses at great risk for a variety of complications. Some of the most significant maternal complications of hypertension in pregnancy include cerebral vascular accident (CVA, or stroke), disseminated intravascular coagulation (DIC), and placental abruption from the elevated blood pressure. Additionally, patients are at risk for the development of HELLP syndrome in the presence of gestational hypertension. Just as its name implies, **HELLP syndrome** causes great dysfunction within the body and requires immediate intervention. It is characterized by:

- Hemolysis of red blood cells, which leads to anemia
- Elevated liver enzymes leading to epigastric pain
- Low platelets, which cause abnormal bleeding and clotting as well as petechiae

Patients whose function continues to decline without intervention can develop eclampsia and are at risk for cerebral hemorrhage, DIC, and placental abruption. Fetal complications include intrauterine growth retardation and premature delivery resulting from decreased placenta perfusion.

**Medical Treatment**

Medical treatment for patients with pregnancy-related hypertension greatly depends on the severity of hypertension and the gestational age of the fetus, as well as the potential risk to the patient and fetus. During early pregnancy, outpatient management is usually appropriate; these patients are monitored at home for blood pressure and proteinuria. Regular fetal monitoring is necessary to evaluate fetal well-being. In addition, placental perfusion tests can also be performed to assess and monitor uteroplacental sufficiency. Patients with evidence of severe dysfunction such as seizures, oliguria, renal failure, or HELLP syndrome are usually delivered immediately.

Since delivery is the only known cure for pregnancy-related hypertension, many healthcare practitioners will recommend immediate induction and delivery if the patient is near-term and shows signs of severe preeclampsia or eclampsia. However, if the healthcare practitioner determines that the fetus is too premature for delivery, antihypertensive medications may be administered to decrease blood pressure, thereby prolonging fetal growth in utero. Glucocorticoids are administered to enhance fetal lung maturity.

Healthcare practitioners may prescribe magnesium sulfate (MgSO₄) during labor and delivery to prevent seizures. Magnesium sulfate is not used to control hypertension. Magnesium sulfate is administered intravenously via an infusion delivery device during delivery and for 24 hours post delivery. Since MgSO₄ can cause fetal respiratory depression following delivery, arrangements should be made for specialized neonatal care.
Nursing Care

Pregnancy-related hypertension presents a great risk to patients and their unborn fetuses. Therefore, it is the responsibility of the nurse to monitor the patient carefully for signs of a decline in health status. The nurse should immediately report increases in blood pressure, visual disturbance changes, severe headaches, epigastric pain, and oliguria to the appropriate healthcare practitioner.

While patients are hospitalized for pregnancy-related hypertension, the nurse will monitor blood pressure and the well-being of the fetus. If magnesium sulfate (MgSO₄) is prescribed for preeclampsia or eclampsia, a Foley catheter is usually inserted to monitor urine output and to obtain regular urine specimens.

The nurse is responsible for administering MgSO₄ and for monitoring its toxicity. Magnesium sulfate toxicity can be prevented by ensuring that urine output is adequate (at least 30 ml/hr), deep tendon reflexes are present, and the respiratory rate is greater than 12 breaths per minute. If MgSO₄ toxicity is noted, the healthcare practitioner must be notified immediately and the infusion discontinued. Calcium gluconate can be administered when prescribed to reverse the effects of MgSO₄ toxicity. The serum magnesium level for patients receiving MgSO₄ should be 4 to 8 mg/dl (Davidson et al., 2012).

In the presence of eclampsia, the nurse must be prepared to prevent injury to the patient during seizures and to monitor seizure activity. Bedside rails should be up and padded. Emergency equipment should be readily available, including an oral airway, oxygen, a bag-valve-mask (BVM), and emergency medication.

In the event of a seizure, patients should be protected from injury. The nurse should note the beginning and ending of the seizure and ensure adequate oxygenation after seizure activity has ceased. The nurse should not attempt to insert an oral airway or other object into the mouth during a seizure. The head can be gently turned to the side to prevent the aspiration of mucus and vomitus into the lungs during seizure activity. The nurse obtains vital signs and monitors the fetus following the seizure.

Labor may progress rapidly during seizure activity. Sometimes newborns are delivered suddenly during a seizure. The nurse should be prepared for an imminent delivery in patients with preeclampsia and eclampsia.

Patient Teaching

Patients suffering from pregnancy-related hypertension who are being treated on an outpatient basis are taught to monitor themselves and their unborn child for a decline in health status. Specifically, patients are taught to notify their healthcare practitioner if they experience headaches, visual disturbances, epigastric pain, or sudden weight gain. Patients may be taught to monitor their weight, blood pressure, and urine protein at home. They are instructed to notify the appropriate healthcare practitioner of elevated blood pressures or protein in the urine. They
should also be instructed to perform daily fetal kick counts to monitor fetal well-being, as well as to increase protein intake because proteinuria decreases the amount of available protein.

The nurse encourages patients with pregnancy-related hypertension to rest in the side-lying position as much as possible, whether at home or in the hospital. This position prevents unnecessary pressure on the vena cava, which decreases renal and placental blood flow and leads to increased blood pressure. The patient should also be instructed to decrease environmental stimuli by lowering or turning off lights and by decreasing the volume on radios or televisions as well as decreasing the number of visitors.

Nursing care should be performed in a manner that prevents unnecessary disturbances to the patient’s environment while hospitalized. Stress and anxiety is a major concern in patients with pregnancy-related hypertension, as it can lead to increased blood pressure. Therefore, the nurse should discuss stress and anxiety management with patients.

### CASE

Eden, a 16-year-old, comes to the OB clinic for her regular checkup. She is pregnant for the first time, with twins, and is in her 37th week of gestation. When her name is called, she rushes in to the examination room saying, “I’m so glad my appointment was today. I would’ve come in even if it weren’t. Mom couldn’t make it today. I had to catch the bus. My head feels like it’s going to explode and my face has gotten fat like my belly. I can’t wait for this whole thing to be over.”

Eden’s vital signs are temperature 98.2 °F, pulse 70, respirations 20, and blood pressure 150/98. Her urine is 2+ for protein. Pitting edema of +2 is noted bilaterally in the lower extremities. The fetal heart rates are in the 150s for both fetuses. Eden’s mother usually attends prenatal appointments and has talked in the past about the seizures she experienced when she was pregnant with Eden.

### Discussion

Eden will be assessed thoroughly for complications associated with pregnancy-related hypertension. She has some risk factors and exhibits several symptoms. Eden is very young, is pregnant with twins, and has a family history of eclampsia. She has proteinuria, facial edema, and edema of the lower extremities. Eden may be hospitalized on bed rest for evaluation of her condition. Her vital signs will be closely monitored with attention to fetal well-being; urinary output; and reports of headache, visual disturbances, and epigastric pain. The goals of hospitalization include prevention of seizure and promotion of a safe delivery. Since Eden is so close to her due date, an induced delivery may be considered. (Case study courtesy of Sharon Walker, RN, MSN.)
GESTATIONAL DIABETES MELLITUS

Gestational diabetes mellitus occurs with the onset of pregnancy and is characterized by the inability of the pregnant patient to tolerate glucose. Patients who develop gestational diabetes may develop diabetes later in life. However, gestational diabetes often resolves after delivery. The cause of gestational diabetes is largely unknown. However, it is believed that as the fetus grows, glucose demands increase for the pregnant patient. In addition, the “insulin-antagonistic” properties of placental hormones affect the patient by causing insulin resistance (Lowdermilk & Perry, 2010). As a result, the pregnant patient is unable to process glucose in the body and hyperglycemia occurs.

Incidence and Risk Factors

According to the American Diabetes Association (2013), gestational diabetes affects 18% of pregnancies. Factors that place patients at risk for developing gestational diabetes mellitus include:

- Maternal obesity
- Advanced maternal age
- Member of a minority population
- GDM in previous pregnancies
- Presence of glycosuria
- History of a macrosomic infant(s) (birthweight >4500 g)
- History of spontaneous abortion or fetal demise
- Family history of diabetes mellitus or GDM

Maternal and Fetal Complications

A variety of maternal and fetal complications are associated with gestational diabetes mellitus. Patients have a significant chance of delivering via cesarean section due to the large size of infants born to patients with gestational diabetes. Patients also have an increased frequency of hypertension.

Infants born to patients with gestational diabetes mellitus are usually macrosomic (birthweight >4.5 kg). This occurs due to fetal hyperinsulinemia as a result of maternal hyperglycemia, which stimulates excessive growth. These large infants may have difficulty maneuvering the birth canal, and a cesarean section may be required. If vaginal delivery is attempted, the infant is at risk for shoulder dystocia or other birth injuries.

After delivery, the newborn infant’s blood glucose must be monitored regularly due to the sharp decrease in available glucose after the umbilical cord is cut. The newborn’s pancreas continues
to produce insulin after delivery despite the decrease in serum glucose. This adds to the potential instability of the infant’s blood glucose. Infants are also at risk for hypocalcemia, hyperbilirubinemia, and respiratory distress syndrome as a result of gestational diabetes.

**Medical Treatment**

Pregnant patients are routinely screened for gestational diabetes mellitus between 24 and 29 weeks’ gestation. In order to diagnose gestational diabetes, patients drink 50 grams of oral glucose solution. After one hour, a blood sample is obtained and tested for glucose tolerance. A glucose level of 140 mg/dL or higher is considered a positive screen and further investigation is warranted. A 3-hour glucose tolerance test is then typically performed.

Most patients with gestational diabetes are treated through diet. They are encouraged to consume a proper diet and obtain adequate exercise. Patients with gestational diabetes should consume a diet that provides 30 kcal/kg/day. Furthermore, patients with a body mass index greater than 30 kg/m² may benefit from a 30%–33% caloric restriction. Besides proper diet and exercise, some patients may require insulin or oral hypoglycemia agents to manage gestational diabetes mellitus. Resistance exercise can help overweight patients with gestational diabetes avoid insulin therapy (de Barros et al., 2010).

**Nursing Care**

It is important for the nurse to monitor serum glucose levels as well as ketones and glucose in the urine throughout the pregnancy of patients with gestational diabetes mellitus. A referral to a dietician may also be necessary. The nurse may also conduct regular fetal surveillance, including non-stress tests (NST) or biophysical profiles (BPP) starting from 32 to 36 weeks’ gestation and until delivery.

During labor, the patient with gestational diabetes mellitus may need to be on intravenous insulin and glucose; blood glucose levels will be monitored regularly according to medical orders or institutional policies. Blood glucose may be monitored as often as every hour.

After delivery, the nurse is responsible for monitoring the infant’s blood glucose levels, as glucose instability is common in newborns born to patients with gestational diabetes mellitus. If the newborn’s blood glucose level is below acceptable national or institutional standards, usually <40 mg/dL, treatment with intravenous fluids, intravenous or oral glucose, or early feedings is necessary. Nurses must be aware of signs and symptoms of hypoglycemia in the newborn, including jitteriness, tremors, irritability, lethargy, seizures, tachypnea, temperature instability, and/or poor feeding and take appropriate action to assist in the treatment of hypoglycemia.

**Patient Teaching**

The nurse working with patients who are diagnosed with gestational diabetes mellitus is often responsible for teaching the patient how to self-monitor and record glucose at home. In addition,
the nurse can teach patients about proper diet and safe exercise during pregnancy. During prenatal visits, the nurse reviews the blood glucose and diet logs to make recommendations about monitoring, medication administration, and diet. Patients may also need to learn how to self-administer insulin. The nurse should make sure the patient can comfortably and appropriately check blood glucose levels and administer insulin by requesting a return demonstration.

It is imperative that the nurse teach patients with gestational diabetes the signs and symptoms of hypoglycemia. These signs and symptoms include shakiness, anxiety, headache, hunger, cold, clammy skin, and tingling around the mouth. The patient should be taught to closely monitor for hypoglycemia and to notify her healthcare practitioner immediately if signs and symptoms are noted.

Hypoglycemia in women with GDM is treated by immediately eating 10 to 20 g of a mixed protein and carbohydrate snack. This mixed protein and carbohydrate snack tends to dampen the rapid elevation of glucose followed by rapid decline that can result in pregnant women with diabetes from consuming a pure simple sugar (Coustan & Jovanovic, 2013).

Since the potential for developing diabetes is significant in patients with gestational diabetes, it is important that patients understand the need for follow-up evaluation after delivery. Patients should continue to watch for signs and symptoms of hypoglycemia and notify their healthcare practitioner if seen.

**CASE**

Agnes is a 31-year-old pregnant for the fourth time. She has one living child, born at 36 weeks’ gestation weighing 11 pounds. Agnes had a stillborn baby born at 36 weeks and one spontaneous abortion. This is her routine 28-week prenatal visit. She arrives early to drink a 50-gram dose of glucose cola and have blood drawn for the oral glucose challenge test. The results of the test are abnormal.

**Discussion**

Agnes shows signs of a history of gestational diabetes mellitus. A macrosomic infant, a stillborn, and a spontaneous abortion are indicative of a diabetic mother. She will be taught to monitor her blood glucose levels and self-administer insulin. The nurse will stress to Agnes the importance of proper diet and blood glucose control for her health and the health of her unborn baby. (Case study courtesy of Sharon Walker, RN, MSN.)

**AMNIOTIC MEMBRANE COMPLICATIONS**

Premature rupture of membranes (PROM) refers to the rupture of membranes one hour or more before the onset of labor, whereas preterm premature rupture of membranes (PPROM) refers to the rupture of membranes prior to 37 weeks’ gestation. PROM and PPROM are often associated with preterm labor and birth.
Incidence and Risk Factors

Preterm premature rupture of membranes (PPROM) occurs in 3% of pregnancies and is the cause of one third of preterm deliveries (Medina & Hill, 2006). Premature rupture of membranes (PROM) occurs in 3% to 18% of all pregnancies (Brown, 2000). Risk factors for preterm premature and premature rupture of membranes include:

- Infections, such as sexuality transmitted infections (STIs)
- Prematurely dilated cervix
- Hydramnios
- Multiple pregnancy
- Fetal malpresentation
- Maternal nutritional deficiencies
- Stress

RESPIRATORY DISEASES AND PROM

Getahun and colleagues (2007) hypothesized “that acute and chronic respiratory diseases [were] associated with [an] increased risk of spontaneous PROM through bacteremia and increased levels of proinflammatory cytokines.” After conducting a study of the delivery data for more than 41 million women, they found that “of the acute respiratory conditions, acute upper respiratory disease and viral and bacterial pneumonia were associated with PROM, but not acute bronchitis. Of the chronic respiratory conditions, asthma was associated with PROM, but chronic bronchitis was not.”

Maternal and Fetal Implications

Preterm premature rupture of membranes can cause a variety of problems, especially for the unborn fetus. Without the protective barrier of the amniotic membrane, the fetus is at a greater risk for the development of infection and preterm delivery. The fetus is also at risk for becoming septic after delivery. Additionally, without the cushioning of the amniotic fluid, there is a higher probability of umbilical cord compression as well as cord prolapse.

Patients with PPROM or PROM have a risk of developing chorioamnionitis, which is an infection of the chorion and amnion of the placenta and can be life-threatening for the patient and fetus.

Medical Treatment

The first step in determining the appropriate course of action for patients with PROM or PPROM involves distinguishing amniotic fluid from urine. Often patients complain of a “sudden gush” or a constant trickle of fluid from the vagina once the membranes have actually ruptured. The
healthcare practitioner will perform a sterile speculum examination to look for pooling of amniotic fluid near the cervix. Fluid is tested using nitrazine paper as well as via microscopic examination for the presence of ferning (the appearance of a fernlike pattern in a dried specimen of cervical mucus or vaginal fluid). Ultrasound examination may be performed to determine the amount of available amniotic fluid after the rupture of membranes.

Medical treatment for patients with PROM or PPROM depends on a variety of factors. Gestational age, fetal lung maturity, available amniotic fluid, and etiology must be considered before deciding on treatment. Patients near term whose labor does not begin spontaneously following the rupture of membranes may be induced if the cervix is ripe. For preterm patients, healthcare practitioners and patients may desire to prolong the pregnancy to promote fetal lung maturity. Patients who are preterm may be prescribed corticosteroids to promote fetal lung maturity until delivery occurs or until there is a need to induce labor.

The cause of early rupture of membranes as well as the degree of amniotic fluid loss must also be considered when determining the appropriate course of action for patients with PPROM. Antibiotics are often administered to treat any infection and to prevent chorioamnionitis. If there is a significant loss of amniotic fluid rather than a slow leak, there is a stronger possibility of the need to induce labor. However, in preterm gestation, an amniotic sac with a slow leak of amniotic fluid may form a seal and the amniotic fluid may reestablish itself (Murray et al., 2010).

**Nursing Care**

As with medical treatment, nursing care greatly depends on whether the medical diagnosis is PPROM or PROM. However, nursing care typically involves assisting the healthcare practitioner to confirm the rupture of membranes, monitoring the patient for infection and for the presence of uterine contractions, and monitoring the status of the fetus. It is imperative that the nurse change patient underpads frequently and avoid unnecessary vaginal examinations to prevent infection.

Often, patients with PPROM who are considered stable are initially monitored on an inpatient basis and then discharged to home. Nursing care for these patients involves teaching about the signs and symptoms of preterm labor and when to call the healthcare practitioner. Nursing care for patients whose labor is induced involves administering induction agents and monitoring the status of the patient, fetus, and uterine contractions. As with all complications in pregnancy, the nurse should be available to answer questions and assist in relieving the patient’s anxiety about her diagnosis.

When dealing with PPROM and PROM, the nurse should be prepared to deal with cord prolapse and compression, which can occur as the umbilical cord slips down in the pelvis and is a life-threatening situation for the fetus; therefore, the fetus must be monitored closely. In the event of cord prolapse and compression, the nurse should attempt to relieve pressure on the umbilical cord and instruct the patient to quickly move into the knee-chest or Trendelenburg positions. Oxygen should be administered and the healthcare practitioner notified immediately.
Patient Teaching

It is important for patients with PPROM to understand the signs and symptoms that suggest infection as well as preterm labor, which often follows PPROM. Patients should be instructed to call their healthcare practitioner or report to the hospital immediately if the following signs and symptoms are noted:

- Fever greater than 100.4 °F (38 °C)
- Foul-smelling vaginal discharge or other signs of infection
- Uterine contractions or cramping (including tightening of the abdomen)
- Decreased fetal movement

In addition, patients should be encouraged to avoid activities or objects that might induce labor or cause infection by exposing the cervix to bacteria. These include sexual activity, orgasm, nipple stimulation, and tampons and douches. Some patients may be placed on bed rest and should be encouraged to follow this directive to prevent preterm labor.

CASE

Neema, a 26-year-old in the 30th week of her second pregnancy, has come to the clinic for an additional prenatal visit. She states, “I came in because I’m not sure what’s going on down there. It feels like I’m peeing on myself, but I don’t think I am.” A small amount of clear liquid is noted on Neema’s peri-pad. She continues, “It all started yesterday morning, and when I told my husband, he said I should stay home from work, relax, and take a nice hot bath.”

A sterile speculum was used to sample the fluid pooled near the cervix. When tested using nitrazine paper and examined microscopically, the fluid is alkalotic and shows ferning. Neema is not experiencing any cramping or uterine contractions. Fetal heart tones are strong and regular, and all of Neema’s vital signs are within normal limits. Neema asks, “Does this mean I will have a dry labor?”

Discussion

Neema has preterm premature rupture of membranes. Since she is stable, is now leaking only small amounts of fluid, and has no signs of infection, her healthcare practitioner may choose to discharge Neema to her home with appropriate discharge instructions. Neema will be told to take her temperature twice a day and report a reading higher than 100.4 °F (38 °C), as well as, uterine tenderness, uterine contractions, or offensive-smelling vaginal discharge. Neema should avoid activities or objects that might bring about labor or cause infection. She will be told to avoid taking baths. Neema should be informed that because amniotic fluid is constantly being formed, she will not experience a dry labor. Neema’s healthcare practitioner may put her on bed rest with bathroom privileges. (Case study courtesy of Sharon Walker, RN, MSN.)
PRETERM LABOR AND BIRTH

Preterm labor refers to labor that occurs after 20 weeks’ but before 37 weeks’ gestation. Preterm birth, a consequence of preterm labor, refers to delivery prior to 37 weeks’ gestation.

Incidence and Risk Factors

Preterm labor is responsible for preterm birth, which affects the ability of the newborn to adjust to extrauterine life. According to the National Vital Statistics Reports (2013), the preterm birth rate in the United States in 2011 was 11.73%. Preterm birth is a significant contributor to infant mortality rates. A variety of risk factors predispose patients to preterm labor and subsequent birth.

- Infection
- Dehydration
- PPROM
- Uterine bleeding
- Diabetes
- Substance abuse
- Smoking
- Incompetent cervix
- Multiple gestation
- Preeclampsia
- Poor nutrition
- Poverty (e.g., homelessness, low socioeconomic status)
- History of preterm labor and birth
- Young or advanced maternal age
- Intimate partner violence (IPV)

Maternal and Fetal Implications

Preterm labor and birth present a unique challenge to patients and their fetuses. Although most of the implications apply to the fetus, patients may suffer from stress due to the diagnosis of preterm labor and birth as well as from the causative agent. Specifically, patients may be experiencing preterm labor and birth due to conditions such as sepsis or IPV. The fetus is at great risk for delivering early as a result of preterm labor. The effects of preterm labor and birth depend on the gestational age of the fetus at delivery. However, the immaturity of fetal lungs in the presence of preterm labor and birth is a significant concern.
Signs and Symptoms

Patients presenting with preterm labor and birth often complain of feeling pressure in the pelvic area, abdominal and/or uterine cramping or contractions, painful or painless contractions, feeling as though the fetus is “balling up,” and/or constant back pain. Amniotic membranes may rupture prematurely; therefore a sudden gush or constant trickle of vaginal fluid may be noted.

Medical Treatment

Clinical criteria for a diagnosis of preterm labor include persistent uterine contractions (4 every 20 minutes or 8 every 60 minutes) and a progressive change in the cervix or cervical dilation greater than 2 cm and cervical effacement of 80% or greater (Chao et al., 2011).

Medical treatment for preterm labor and birth is dependent upon the gestational age of the fetus. Generally, healthcare practitioners seek to avoid delivery of patients prior to 34 weeks’ gestation to allow further maturation of the fetal lungs. They often prescribe antibiotics to treat infection, glucocorticoids to increase fetal lung maturity, intravenous therapy to maintain hydration, and tocolytics to control uterine contractions in patients with preterm labor.

Nursing Care

Nursing care for patients experiencing preterm labor include administering prescribed medications such as antibiotics, glucocorticoids, intravenous fluids, and tocolytics and preparing the patient for possible delivery. While hospitalized, patients should be monitored for signs and symptoms of infection, which can lead to preterm labor. Fetal tachycardia indicates possible infection and should be evaluated immediately. Vital signs, contractions, and fetal status should be assessed as ordered or according to institutional policy. As patients are often permitted to remain at home once stable, nursing care for these patients include teaching patients preventive measures that will help them avoid early delivery.

When patients are faced with the possibility of delivering a preterm infant, the situation may quickly become overwhelming to them. Although preterm labor and birth can occur rapidly, it is imperative that nurses address the emotional issues of the patient. Generally, this will involve answering patient questions about the status of the fetus and preparing the patient for the care required to prevent delivery or the necessary preparation for preterm delivery.

Patient Teaching

The major goal of teaching patients with preterm labor is to help them become aware of factors that may cause premature labor and delivery. Patients are taught to:

- Avoid activities that may disturb the cervix and cause labor or infection (e.g., vaginal exams, sexual activity, orgasm, tampons, douches)
• Rest in the side-lying position to improve blood flow to the uterus
• Consume adequate fluid to prevent dehydration, which causes the release of oxytocin
• Notify their healthcare practitioner immediately if any of the following signs and symptoms are noted: uterine contractions, cramping or irritability, constant back pain, a feeling that the fetus is “balling up,” a gush or a constant trickle of vaginal fluid, or fever

CASE

Ciara phones the perinatal clinic. She is 18 years old and in the 32nd week of her second pregnancy. Ciara’s first child was born at 36 weeks’ gestation. After reviewing her chart, the nurse discovers that there is a history of social service intervention. As a result of Ciara’s impoverished circumstances, Ciara and her 3-year-old child receive nutritional support through the WIC (women, infants, and children) program and live in a shelter to escape from an abusive cohabiting male.

Ciara is sobbing over the phone and keeps repeating, “I don’t want it to happen again.” The nurse asks Ciara to take a deep breath, sit down, and explain how she is feeling. After a short time, Ciara states that she is having uterine contractions that are occurring every 10 minutes and lasting for 1–2 minutes. The contractions started about three hours ago and did not stop when she tried to walk. Asked about a gush of water from the vagina, she denies it. Ciara says, “I still feel the baby kicking. That’s a good thing, isn’t it? Did I make this happen?”

Ciara is told to have someone bring her to the hospital as soon as possible. She states that she already called for a ride and that she should be arriving at the hospital within 30 minutes. The nurse tells Ciara to lie down on her side, drink plenty of fluid, and wait for her ride. Ciara responds, “I can do that. Lisa, my roommate is napping and won’t wake up for a while.”

Discussion

Ciara may be in preterm labor. She has several risk factors, including poverty, a history of preterm labor and birth, poor nutrition, and possibly IPV. Ciara will be assessed for the condition of her cervix and amniotic membranes upon arriving at the hospital. Vital signs, contractions, and fetal status will be evaluated. She will also be observed for signs of infection and dehydration. She is very anxious, and because she has had a previous preterm birth, Ciara may have feelings of guilt that require reassurance and psychological support. The goal of her hospitalization would be to avoid delivery.

(Case study courtesy of Sharon Walker, RN, MSN.)
CONCLUSION

Pregnancy, labor, and birth are a wondrous time in the lives of countless women and their families. However, this time can be clouded by a variety of complications that affect the patient and fetus. Fortunately, with early identification and treatment of complications and their side effects, patients and their infants have a greater chance of survival and the potential to thrive after delivery.

Nurses play a special role in ensuring the safety of the patient and her unborn child during all phases of pregnancy and delivery. They must be knowledgeable about complications that can occur during pregnancy and ready to act on behalf of the patient and her child. This is the responsibility and goal of the perinatal nurse. Most hospitals and birthing centers provide guidelines for nurses providing care to patients experiencing complications during their pregnancies and nurses should always follow the recommendations of their facilities.

RESOURCES

American Cancer Society, Gestational trophoblastic disease
cancer.org/cancer/gestationaltrophoblasticdisease/

American Congress of Obstetricians and Gynecologists
acog.org

American Diabetes Association, Gestational diabetes
diabetes.org/diabetes-basics/gestational/

American Society of Reproductive Medicine
asrm.org

Association of Women’s Health, Obstetric and Neonatal Nurses
awhonn.org

International Federation of Gynecology and Obstetrics
figo.org

HER—Hyperemesis Education & Research
helpher.org

March of Dimes (preterm birth information)
marchofdimes.com
REFERENCES


Smith CA & Cochran S. (2009). Does acupuncture have a place as an adjunct treatment during pregnancy: a review of randomized controlled trials and systematic reviews. Birth, 36(3).


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1. Which description is a partial definition of fetal viability?
   a. Gestation greater than 20 weeks
   b. Fetal size greater than 400 grams
   c. Very active fetal movement
   d. Periodic uterine contraction

2. Which is a common symptom of hypovolemic shock?
   a. Hot, dry, and flushed skin
   b. Increased heart rate
   c. Increased blood pressure
   d. Smoky or cloudy urine

3. The perinatal nurse caring for a patient who is experiencing a spontaneous abortion is aware that:
   a. Guilt feelings in the patient are never a factor.
   b. Grief generally occurs only when the loss is in the third trimester.
   c. Emotional stress is not experienced by the patient.
   d. Significant emotional challenges are likely to arise.

4. The major physiologic mechanism of DIC is:
   a. Over-activation of the blood-clotting process.
   b. Decreased glomerular filtration.
   c. Amniotic fluid forced into the maternal circulation.
   d. A combination of hemolysis, elevated liver enzymes, and low platelets.

5. How does the nurse instruct a patient who is discharged after a spontaneous abortion?
   a. Try having another baby as soon as possible.
   b. Decrease fluid intake to decrease the bleeding.
   c. Take your iron supplements and/or antibiotics as directed.
   d. Douche every other day for at least two weeks.
6. Which prenatal condition is a risk factor for an ectopic pregnancy?
   a. A sexually transmitted infection
   b. Multiple pregnancies
   c. Beginning sexual activity at an early age
   d. Regular heavy menstrual periods of four days’ duration

7. A patient who is admitted for an ectopic pregnancy and treated with methotrexate requires:
   a. Guidelines about immediately increasing her exercise level.
   b. Counseling to avoid talking about and grieving the lost pregnancy.
   c. Instruction to avoid foods and vitamins containing folic acid and alcohol.
   d. Encouragement to reduce the intake of fast foods that are high in fat.

8. At a prenatal visit, assessing which patient finding might suggest gestational trophoblastic
disease?
   a. A decreased serum hCG level
   b. A fetal heart tone that is much faster than expected
   c. A uterus that is enlarged beyond the expected size
   d. A blood pressure of 120/80 mm Hg with weight gain

9. After a molar pregnancy, the female patient is instructed to follow up in one year for
   possible:
   a. Choriocarcinoma.
   b. Hypertension.
   c. Anemia.
   d. Infection.

10. Which antenatal intervention is contraindicated for a patient with a suspected placenta
    previa?
    a. External fetal monitoring
    b. Determination of fetal lie
    c. Vaginal examination
    d. Non-stress testing to evaluate fetal status

11. Which physical examination finding is predictive of placental abruption?
    a. Excessive fetal movement
    b. A board-like abdomen
    c. Foul-smelling vaginal discharge
    d. A decreased maternal heart rate
12. Which maternal symptom best distinguishes placenta previa from abruptio placentae?
   a. Tachypnea
   b. Painless, bright red vaginal bleeding
   c. Ruptured membranes
   d. Confusion and disorientation

13. The nursing care for a patient with hyperemesis gravidarum is based on which knowledge?
   a. The condition is always psychological.
   b. Dehydration and starvation are possible outcomes.
   c. The clinical symptoms resemble those of morning sickness.
   d. The impact on the fetus is negligible.

14. The classic symptom of preeclampsia is:
   a. Hematuria.
   b. Bacteria.
   c. Proteinuria.
   d. Glucosuria.

15. The only known cure for pregnancy-related hypertension is:
   a. Antihypertensive medication.
   b. Anticonvulsant medication.
   c. Glucocorticoid administration.
   d. Delivery of the baby.

16. A patient with pregnancy-related hypertension is admitted with visual disturbance changes, severe headaches, and epigastric pain. When the severity of these symptoms and the patient’s blood pressure increases, the nurse’s intervention is to:
   a. Collect the emesis basin and prepare for vomiting.
   b. Take a rectal temperature to rule out infection.
   c. Send a blood specimen for type and cross match.
   d. Call the appropriate healthcare practitioner immediately.

17. A patient who is pregnant is treated with an IV magnesium sulfate infusion for preeclampsia. Which nursing assessment indicates a toxic level of the medication?
   a. A urine output of 35 ml/hour
   b. Petechiae
   c. Increased bleeding
   d. A respiratory rate of 8 breaths/min
18. When the threat of eclampsia develops, which equipment does the nurse obtain to prevent injury to the female patient from seizures?
    a. An assistive defibrillator
    b. A lumbar puncture tray
    c. An oral airway, oxygen, and BVM
    d. A tracheostomy set and a ventilator

19. Which is a risk factor for gestational diabetes mellitus?
    a. A history of delivering a macrosomic infant
    b. A young maternal age
    c. The presence of proteinuria
    d. An underweight status before pregnancy

20. Which significant complication is carefully monitored in the newborn infant who is born to a female patient with gestational diabetes?
    a. Hypercalcemia
    b. Hypobilirubinemia
    c. Hypoglycemia
    d. Hyperinsulinemia

21. Which intervention reduces complications in the female patient with gestational diabetes?
    a. Prompt administration of insulin to the newborn after delivery
    b. Self-administration of glucose cola every morning during pregnancy
    c. Close monitoring of glucose and ketones at home during pregnancy
    d. Strict dieting to prevent fetal macrosomia during pregnancy

22. A risk factor for premature rupture of membranes is:
    a. Hydramnios.
    b. A head-down fetal presentation.
    c. A high-fat maternal diet.
    d. Cephalopelvic disproportion.

23. Glucocorticoids are administered to a patient who is experiencing preterm labor for which reason?
    a. To stop labor and birth
    b. To treat infection
    c. To increase fetal lung maturity
    d. To serve as an anti-anxiety medication
24. A patient with preterm labor asks the nurse why she needs to rest in the side-lying position. The nurse responds that this position:
   a. “Gives your baby more space to move.”
   b. “Improves blood flow to your uterus.”
   c. “Takes pressure off of your back.”
   d. “Will help you feel more comfortable during contractions.”