Care of the Woman with Anemia

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Introduction

-Definition: Anemia indicates inadequate levels of hemoglobin (Hb) in the blood:

- less than 12 g/dl in nonpregnant women
- less than 11 g/dl in pregnant women.

-Factors affect the normal limits of hemoglobin: Race, altitude, smoking, nutrition, and medication.

-The common causes of anemia in pregnancy:

- Insufficient hemoglobin production related to nutritional deficiency in iron or folic acid during pregnancy
- Hemoglobin destruction in inherited disorders, specifically sickle cell anemia and thalassemia.

Iron Deficiency Anemia

-Iron deficiency anemia is the **most common** medical complication of pregnancy.

-**Dietary iron** is needed to synthesize hemoglobin.

-Because hemoglobin is necessary to **transport oxygen**, a deficiency of iron may affect the body's transport of oxygen.

-Causes of iron deficiency: **primarily** as a consequence of **expansion of plasma volume without normal expansion of maternal hemoglobin mass.**

-In pregnancy, many women begin slightly anemic, **mild** anemia can rapidly become more **severe**; therefore, it needs immediate treatment.

-The greatest need for increased iron intake occurs in the **second half of pregnancy.**

-When the iron needs of pregnancy are not met, maternal **hemoglobin** falls below 11 g/dl. **Serum ferritin levels,** indicating iron stores, are below 12 mg/L.

- 200 mg of iron will be **conserved** because of amenorrhea.
- Needs 1000 mg **more iron intake** during the pregnancy.

Maternal Complication

- Susceptible to infection
- Tire easily.
- Has an increased chance of preeclampsia and postpartal hemorrhage.
- Tolerates poorly even minimal blood loss during birth.
- Healing of an episiotomy or an incision may be delayed.
- If the anemia is severe (Hb less than 6 g/dl), cardiac failure may ensue.

Fetal-Neonatal Risks

- Low birth weight
- Prematurity
- Stillbirth
- Neonatal death in infants of women with severe iron deficiency (maternal Hb less than 6 g/dl).

The infant is **not iron deficient at birth** because of active transport of iron across the placenta.

However, these babies do have lower iron stores and are at **increased risk for developing iron deficiency during infancy.**

Clinical Therapy

To prevent anemia,

- recommend that pregnant women take at least 27 mg supplements of iron daily. This amount is contained in most prenatal vitamins.
- Eat an iron-rich diet.

To prevent constipation, a stool softener may be necessary.

If anemia is **diagnosed**, **Treatment :**

- The dosage should be increased to **60 to 120 mg per day** of iron.

With a twin pregnancy, a larger dose is needed.

If a large dose of oral iron causes vomiting, diarrhea, or constipation, or if the anemia is discovered late in pregnancy, **parenteral iron may be needed.**

NURSING CARE MANAGEMENT

- **Nursing Assessment and Diagnosis**

- fatigue.
- evidence of poor dietary intake of iron.
- Physical examination reveals pallor of skin and conjunctiva.
- Laboratory studies show hemoglobin values below 10 g/dl, serum ferritin levels below 12 mg/L, and possibly microcytic and hypochromic red blood cells (a late finding).

Nursing diagnoses

- Risk for Imbalanced Nutrition: Less Than Body Requirements related to inadequate intake of iron-containing foods
- Constipation related to daily intake of iron supplements

- **Nursing Plan and Implementation**
  - The woman is taught to take iron tablets with vitamin C (e.g., orange juice) to increase absorption.
  - Iron absorption is reduced by 40% to 50% if the tablets are taken with meals. However, gastrointestinal upset is more likely if they are taken on an empty stomach.
  - The patient may tolerate the iron better if she starts with small doses and gradually increases the dosage over several days.
  - She is informed that her stool will turn black and may be more formed.
  - She is also advised to keep the tablets out of the reach of children because ingestion may be fatal to a young child

Folic Acid Deficiency Anemia

Megaloblastic anemia

It is more prevalent with twin pregnancies.

Folic acid is needed for deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) **synthesis and cell duplication**.

In its absence,

- immature red blood cells fail to divide,
- become enlarged (megaloblastic), a

- nd are fewer in number.

Inadequate intake of folic acid has been associated with **neural tube defects (NTDs) (spina bifida, anencephaly, meningomyelocele)** in the fetus or newborn.

** Increased urinary excretion of folic acid and fetal uptake can rapidly result in folic acid deficiency.

Clinical Therapy

- Diagnosis may be difficult, and it is usually not detected until late in pregnancy or the early puerperium. Because serum folate levels normally fall as pregnancy progresses. Even though folate levels are lower with deficiency, they will fluctuate with diet. Measurement of erythrocyte folate status is more reliable
- Women with true folic acid deficiency anemia often **present with nausea, vomiting, and anorexia.**
- Hemoglobin levels as low as 3 to 5 g/dl may be found. Typically the blood smear reveals that the newly formed erythrocytes are macrocytic.
- Prevented by a **daily supplement of 0.4 mg of folate.**
- Treatment of deficiency consists of **1-mg** folic acid supplement.
- Because iron deficiency anemia almost always coexists with folic acid deficiency, the woman also needs iron supplements.

NURSING CARE MANAGEMENT

- Teaching pregnant women about food sources of folic acid and cooking methods for preserving folic acid.
- The best sources are fresh leafy green vegetables, orange juice, other citrus fruits and juices, red meats, fish, poultry, and legumes.
- As much as 50% to 90% of folic acid can be lost by cooking in large volumes of water.
- Microwave cooking destroys more folic acid than conventional cooking.
- The U.S. Public Health Service recommends that all women of childbearing age (15 to 45 years) consume 0.4 mg of folic acid daily.

Sickle Cell Disease

(SCD) is a recessive autosomal disorder in which the normal adult hemoglobin, hemoglobin A (HbA), is abnormally formed.

Abnormal called hemoglobin S (HbS).

The abnormal red cells break down, causing anemia, which is characterized by **acute, recurring episodes of tissue, abdominal, and joint pain.**

- Individuals with the disorder are **homozygous** for the sickle cell gene. They inherit from each parent an allele causing an amino acid substitution in the two beta protein chains in the hemoglobin molecule.
- **Heterozygous** individuals are carriers for sickle cell trait (SCT) but are usually asymptomatic. One of the beta protein chains formed in their hemoglobin is normal; the other has the amino acid substitution.

Hemoglobin S (HbS) causes the red blood cells to be **sickle** or crescent shaped. In conditions of **low oxygenation**, normal hemoglobin is soluble, but HbS becomes **semisolid** and distorts the red blood cell shape.

These erythrocytes easily inter lock and clog capillaries, particularly in organs characterized by slow flow and high oxygen extraction, such as the **spleen**, **bone marrow, and placenta.**

This phenomenon, called sickling, varies in frequency depending on

- **the amount of the HbSin the red blood cells (there is seldom a crisis with levels below 40%)**
- **and other hemoglobin factors.**

Diagnosis is confirmed by **hemoglobin electrophoresis or a test to induce sickling in a blood sample.**

Maternal Risks

- Increased risk for nephritis, bacteriuria, and hematuria, and tend to become anemic.
- Women with sickle cell disease have considerably more risk during pregnancy.

- Low oxygen pressure—caused by high temperature, dehydration, infection, or acidosis, for example— may precipitate a vaso-occlusive crisis.
- The crisis produces sudden attacks of pain that may be general or localized in bones or joints, lungs, abdominal organs, or the spinal cord. The pain is due to ischemia in the tissues from occluded capillaries.
- Vaso-occlusive crises occur more often in the **second half of pregnancy**.
- Maternal mortality due to sickle cell disease is rare.
- **Other complications** included anemia requiring blood transfusion, infections, and emergency cesarean section. Acute chest syndrome, congestive heart failure, or acute renal failure may also occur.

Fetal-Neonatal Risks

Prematurity and intrauterine growth restriction (IUGR) are also associated with sickle cell disease.

Fetal death is believed to be due to sickling attacks in the placenta.

Clinical Therapy

- Because the woman with sickle cell disease maintains her hemoglobin levels by intense erythropoiesis, additional **folic acid supplements (4 mg/day) are required.**
- Maternal **infection** should be treated promptly because dehydration and fever can trigger sickling and crisis.
- Vaso-occlusive crisis is best treated by a perinatal team in a medical center. Proper management requires **close observation and evaluation of all symptoms**. The term sickle cell crisis should be applied only after all other possible causes for the pain are excluded.
- Rehydration with intravenous fluids; administration of oxygen, antibiotics, and analgesics; and monitoring of fetal heart rate are important aspects of therapy.
- Antiembolism stockings may be used postpartum.
- If vaso-occlusive crisis occurs during labor,
  - the previous therapies are instituted
  - and the woman is kept in a left lateral position.
  - Oxytocics may be used if needed to promote labor.

- Episiotomy and outlet forceps may be recommended to shorten the second stage of labor.
- Several antisickling agents are being researched, and in the future sickle cell crisis may be prevented.

NURSING CARE MANAGEMENT

Nursing Assessment and Diagnosis

- **Abdominal and joint pains and is found to be extremely anemic.**
- The woman may appear undernourished and have long, thin extremities.
- Ulcers are often present on her ankles.
- Anemia may be severe.
- A diagnosis of sickle cell disease is confirmed by **hemoglobin electrophoresis or a test to induce sickling in a blood sample**.
- The woman is assessed for infection, which is associated with one third of sickle cell crises in adults. Infections most often seen during pregnancy or post partum are pneumonia, urinary tract infections, puerperal endomyometritis, and osteomyelitis. Fetal status is assessed during a crisis by electronic fetal monitoring.
- During labor, the woman's vital signs are assessed frequently and continuous fetal heart rate monitoring is initiated. Compatible blood should be available for transfusion.
- Oxygen is administered if necessary.
- The woman is assessed for joint pains and other signs of sickle cell crisis.

Nursing diagnoses

- Acute Pain related to the effects of sickle cell crisis
- Readiness for Enhanced Knowledge about the need to avoid exposure to infection related to the risk of triggering a sickle cell crisis

Nursing Plan and Implementation

- Teaching to help prevent a sickle cell crisis, improve the anemia, and prevent infection.
- The nurse teaches the woman to increase hydration, use good hygiene, avoid people with infections, seek immediate treatment for infection, and take folic acid supplements.
- folic acid is important because of its role in red blood cell production; therefore, folic acid supplements are essential.

- Bed rest is sometimes recommended to decrease the chance of preterm labor.
- Other nursing interventions are aimed at facilitating the medical therapy and alleviating anxiety through support and education. Partners should be screened to evaluate their sickle cell status.

Thalassemia

- The thalassemias are a group of autosomal recessive disorders characterized by a **defect in the synthesis of the alpha or beta chains in the hemoglobin molecule.**
- Symptoms are caused by the shortened lifespan of the red blood cells, which result in **active erythropoiesis in the liver, spleen, and bones.** This produces **hepatosplenomegaly** and, sometimes, bony **malformations**.
- Early identification of thalassemia and preventive management avoids missed diagnosis and unnecessary treatment for iron deficiency anemia.
- **Heterozygous** for β-thalassemia, **half of the beta** chains are formed normally. This is **β-thalassemia minor**, or β-thalassemia trait. Mild anemia is usually the only symptom.
- Persons born **homozygous** for the disease have **β-thalassemia major**.
- Because newborns have fetal hemoglobin (**HbF**), which does not have beta chains, no **symptoms are present for several months.**
- Once infants with β-thalassemia major start producing adult-type hemoglobin (**HbA**), they **develop severe anemia and are dependent on transfusions** from which they eventually develop iron overload.
- **Iron chelation therapy** must be instituted soon after chronic transfusions are begun because excess iron damages the liver and heart.
- Without chelation therapy, these children do not live past the second or third decade.
- Girls with the disorder are often amenorrheic and infertile.

Maternal-Fetal-Neonatal Risks

- The woman with β-thalassemia minor has **mild anemia** with small (microcytic) red cells.

- This mild anemia must be distinguished from iron deficiency anemia because a woman with β-thalassemia minor should not receive iron therapy unless she is also deficient in iron.
    - A woman with iron deficiency anemia typically has **low serum iron and serum ferritin levels**,
    - whereas the woman with β-thalassemia minor has **normal levels.**
- **B-thalassemia minor varies in degree of severity** from extremely mild (minima) anemia, which results in a relatively smooth pregnancy, to a more symptomatic form (intermedia).

Pregnancy is rare in women with β-thalassemia major. If it does occur, the woman generally **has severe anemia, needs transfusion therapy**, and is at **risk for congestive heart failure**. These women are generally cared for by a perinatologist in a facility that can accommodate high-risk pregnancies.

Clinical Therapy

- **Folic acid supplements** are indicated for women with thalassemia, but iron supplements are not given.
- May need **transfusion and chelation therapy.**
- They should avoid exposure to infections and seek treatment promptly if an infection develops. Their care is similar to that of women with sickle cell anemia.

NURSING CARE MANAGEMENT

The woman with thalassemia needs to understand her disease and the possibility of transmitting it to her offspring.