



Anemia in Pregnant Women: Optimizing Nutrition for a Healthy Pregnancy

Anemia en embarazadas: Optimizando la nutrición para una gestación saludable

Deysi Viviana Bonilla-Ledesma¹✉, Mariela Jomayra Bonilla-Ledesma¹, Lisset Alejandra Monserrate-Constantine¹

¹Centro de Salud del Cantón Quevedo. Ecuador.

Recibido: 07 de abril de 2025

Aceptado: 10 de abril de 2025

Publicado: 12 de abril de 2025

Citar como: Bonilla-Ledesma DV, Bonilla-Ledesma MJ, Monserrate-Constantine LA. Anemia en embarazadas: Optimizando la nutrición para una gestación saludable. Rev Ciencias Médicas [Internet]. 2025 [citado: fecha de acceso]; 29(2025): e6728. Disponible en: <http://revcmpinar.sld.cu/index.php/publicaciones/article/view/6728>

ABSTRACT

Introduction: the correct nutrition of pregnant women is of vital importance; inadequate nutrition will have a negative impact on the pregnancy and the mother's health.

Objective: to determine the dietary habits of pregnant women with anemia at the Quevedo Health Center.

Methods: cross-sectional observational research design. The study uses a quantitative approach; non-experimental design, with descriptive scope, in addition, personal characteristics were observed in terms of habits, knowledge, food and its relationship with nutrition.

Results: as a result, we found that most pregnant women do not have enough knowledge on how to have a correct and healthy diet; a minimum number of pregnant women believe that they nourish themselves in a correct way.

Conclusions: pregnant women have unbalanced eating habits, inadequate knowledge of nutrition, the health system does not properly educate pregnant women about proper nutrition, so it is recommended more support and nutritional care by the health body.

Keywords: Pregnancy; Anemia; Nutrition.

RESUMEN

Introducción: la correcta alimentación de la mujer gestante es de vital importancia, una inadecuada alimentación se reflejará de forma negativa sobre el embarazo y la salud de la madre.

Objetivo: determinar los hábitos alimentarios en mujeres embarazadas con anemia del Centro de Salud del Cantón Quevedo.

Métodos: diseño de investigación observacional transversal. El estudio utiliza un enfoque cuantitativo; de diseño no experimental, con alcance descriptivo, además se observaron características personales en cuanto a hábitos, conocimientos, alimenticios y su relación con la nutrición.

Resultados: como resultado nos fijamos que la mayor parte de mujeres embarazadas no tienen conocimientos suficientes de cómo llevar una correcta y saludable alimentación, una mínima cantidad de mujeres gestantes cree que se nutre de manera correcta.

Conclusiones: las mujeres embarazadas poseen hábitos alimenticios desequilibrados, conocimientos de nutrición inadecuados, el sistema de salud no educa correctamente a las mujeres gestantes sobre una correcta nutrición por lo que se recomienda más apoyo y atención nutricional por parte de del cuerpo de salud.

Palabras Claves: Embarazo; Anemia; Nutrición.

INTRODUCTION

Currently, health issues are rarely discussed. Nutrition during pregnancy is often a controversial or poorly educated topic. Some foods are restricted or prohibited, while others are considered essential to prevent maternal and child malnutrition. This could, on the one hand, be due to a lack of understanding of the topic. However, there is some data on the nutritional habits, knowledge, and behavior of pregnant women.⁽¹⁾

A healthy diet consists of eating a variety of foods that provide you with the nutrients you need to stay healthy, feel good, and have energy. Maintaining a healthy diet is very important throughout our lives as it is one of the main recommendations for staying healthy.

Healthy eating during pregnancy is vitally important for the well-being of both the mother and the developing fetus. During this stage, the body undergoes significant changes that require adequate nutrient intake to ensure a successful pregnancy and the long-term health of both mother and baby. One of the common nutritional challenges pregnant women face is preventing anemia, a condition in which the body has low levels of red blood cells and, therefore, insufficient oxygen is transported to the tissues.

According to official WHO statistics, anemia is considered one of the most serious public health problems worldwide. An estimated 1.62 billion people suffer from it, of which the most vulnerable populations are pregnant women and children between six and 59 months of age. According to the WHO, iron deficiency is the main cause of anemia, particularly in countries with medium and low economic development.⁽²⁾

There are multiple causes of anemia, the most common being iron deficiency, a fundamental element without which hemoglobin cannot be produced. When the physician determines that the cause of anemia is iron deficiency, he must also investigate and determine the reason for the decrease.⁽³⁾

Parenteral iron may be administered in the second or third trimester for patients with: a) moderate to severe anemia (hemoglobin < 9 g/dl); b) intolerance to oral iron; c) patients who do not respond adequately to oral therapy (WHO).⁽⁴⁾

This research project aims to raise awareness about nutrition among pregnant women in the city of Quevedo. Anemia during pregnancy is particularly concerning, as it can have adverse effects on fetal growth, increase the risk of premature birth, and affect the mother's health. One of the most common causes of anemia in pregnant women is iron deficiency, a mineral essential for the production of red blood cells and the transport of oxygen in the body. To prevent anemia and promote healthy eating during pregnancy, it is essential to include a variety of key nutrients in the daily diet:

- ✓ Eating iron-rich foods, such as lean meats, fish, legumes, spinach, and fortified cereals, can help maintain hemoglobin levels and prevent anemia.
- ✓ The above leads us to consider the following objective: To determine the eating habits of pregnant women with anemia at the Quevedo Canton Health Center.

METHODS

A cross-sectional observational research design was used. The study uses a quantitative, non-experimental approach with a descriptive scope. Personal characteristics were also observed regarding eating habits, knowledge, and their relationship to nutrition. The analysis of habits and knowledge was integrated with the lifestyle and nutritional status of the pregnant mothers.

It also includes bibliographic research that involves searching, compiling and analyzing sources of information previously written by other authors.

This research was conducted at the Quevedo Canton Health Center, located in the province of Los Ríos, Ecuador. The study population consisted of female patients suffering from anemia during pregnancy; the population consisted of women at different stages of pregnancy, and the sample size obtained was 26 patients.

The data collection techniques were Literature reviews addressing aspects related to dietary habits, nutrient intake, knowledge about anemia prevention, and nutrition during this stage, such as foods consumed, degree of anemia in pregnant women, and the women's age range. In addition, tests to measure hemoglobin levels in the blood were determined to identify the presence of anemia. Questions were used regarding the frequency and variety of consumption of foods rich in iron, folic acid, and vitamin B12, and an assessment of pregnant women's understanding of the importance of nutrition during pregnancy and anemia prevention.

The data generation process involved using medical history and anemia history to determine the presence of previous anemia and its treatment. Data were collected at a specific time point to analyze the relationship between healthy eating and the presence of anemia in pregnant women.

RESULTS

The results obtained from this research on healthy eating and anemia prevention in pregnant women at the Health Center are diverse and provide valuable information for maternal and child health in the region. The following are potential outcomes from this research:

Anemia.- According to official WHO statistics, anemia is considered one of the most serious public health problems worldwide. An estimated 1.62 billion people suffer from it, with the most vulnerable populations being pregnant women and children between 6 and 59 months of age. According to the WHO, iron deficiency is the main cause of anemia, particularly in countries with medium and low economic development.⁽²⁾

Types of anemia: Mild anemia. Individuals usually have no symptoms. Fatigue, sleepiness, dyspnea, and palpitations are present after activity. The most notable characteristic is a loss of appetite, which leads to malnutrition. Mild anemia is considered a hemoglobin level of 10–10.9 g/dL at sea level.

Moderate anemia. Typically, the individual presents symptoms during rest, being unable to tolerate physical exertion. He or she may be aware of the hyperdynamic state and complain of palpitations. Loss of appetite increases, with pallor being the most common physical sign. Hemoglobin levels are between 7 and 9.9 g/dl at sea level.⁽⁵⁾

Severe anemia. - The symptoms of this type of anemia extend to other organ systems, presenting with intense dizziness, headache, tinnitus, and vertigo; irritability, difficulty falling asleep, and difficulty concentrating are evident. Due to the decrease in cutaneous blood flow, hypersensitivity to cold begins. The gastrointestinal system is also affected, linked to anorexia, digestion, and even nausea or intestinal irregularities that are attributable to the shunting of blood away from the splenic bed. The hemoglobin concentration is less than 7 g/dL at sea level.⁽⁶⁾

Diagnosis Diagnosing nutritional deficiency, especially anemia in pregnant women, involves a comprehensive medical and laboratory evaluation. The following describes how nutritional deficiency is diagnosed in pregnant women with anemia:

Medical history and symptoms: The diagnostic process begins with a detailed review of the patient's medical history and a discussion of any symptoms she may be experiencing. This includes questions about fatigue, weakness, paleness, dizziness, shortness of breath, and other symptoms related to anemia.

Physical examination: The doctor will perform a physical exam to look for signs of anemia, such as pale skin and mucous membranes, brittle nails, and changes in the size of the spleen or liver.

Blood test: Blood tests are essential to confirm the diagnosis of anemia and determine its underlying cause. Some of the key blood parameters evaluated include:

Hemoglobin (Hb): The hemoglobin concentration in the blood is checked. Low values indicate anemia.

Hematocrit (Hct): The percentage of blood cell volume in relation to total blood volume is measured. Low values may indicate anemia.

Diet assessment: The doctor or a registered dietitian may also perform an assessment of the patient's diet to identify possible nutritional deficiencies, such as insufficient intake of iron, folic acid, vitamin B12

Timely treatment: Early diagnosis of anemia is essential to begin treatment promptly. Pregnant women with anemia may require iron supplements or other treatments to correct nutrient deficiencies and prevent complications.

Personalization of treatment: Information on other blood parameters, such as hematocrit, red blood cell count, MCV, MCHC, serum ferritin, and TIBC, allows healthcare professionals to better understand the underlying cause of anemia. This helps them tailor treatment to the specific deficiency, whether of iron or another essential nutrient.

Symptoms and general well-being: Evaluating symptoms such as fatigue, weakness, and pallor is essential because it provides a more complete picture of the pregnant woman's health. This can help physicians identify and address any other anemia-related conditions and improve the patient's quality of life.⁽⁷⁾

Causes of anemia.- There are multiple causes of anemia, the most common being iron deficiency, a fundamental element without which hemoglobin cannot be produced. When the physician determines that the cause of anemia is iron deficiency, he or she must also investigate and determine the reason for the decrease.⁽⁷⁾

Parenteral iron may be administered in the second or third trimester for patients with: a) moderate to severe anemia (hemoglobin < 9 g/dl); b) intolerance to oral iron; c) patients who do not respond adequately to oral therapy (WHO).⁽⁴⁾

Nutritional needs of pregnancy

Energy. - Its main sources are carbohydrates and fats, an average intake of 300 kcal more is required for the entire pregnancy, that is, an approximate daily intake of between 2,150 kcal and 2,200 kcal with a daily intake of 175 g. in pregnancy and during lactation to 210 g. Fats are a source of energy and also an important part of cellular structure, in addition to this, they are a vehicle for fat-soluble vitamins (A, D, E and K), they are a source of energy, they protect organs and lubricate tissues, the total fat intake should be 20-35 g per day, mainly unsaturated fats and to a lesser extent saturated fats, cholesterol and trans fats.

Proteins.- The increased protein requirement is due to the development of maternal, fetal, and placental tissue. Approximately 925 g of protein are accumulated throughout pregnancy, resulting in the daily recommendation increasing from 46 g/day in non-pregnant patients to 71 g/day in pregnant women. When caloric intake is deficient, proteins are metabolized rather than stored for the fetus.

Fiber.- These help reduce cholesterol levels, regulate blood sugar, and contribute to weight loss by controlling appetite. Pregnant women require 28 g of fiber per day, breastfeeding mothers about 29 g, while women of reproductive age require 25-26 g/day.

Iron. Iron deficiency during pregnancy is associated with low birth weight, prematurity, and increased perinatal mortality. It also impairs the cognitive performance and physical development of newborns. The recommended dose of elemental iron during pregnancy is 30–60 mg/day, with a particularly high dose during the second and third trimesters. In women with pre-existing deficiency, iron administration should begin as soon as possible, and the recommended dose is 100–120 mg/day.

Folic acid. - Folate and its active form, tetrahydrofolate, participate as coenzymes in the synthesis of nucleic acids and amino acids. The RDI for non-pregnant women of reproductive age is 400 mcg. For pregnant women, the recommended intake is 600 mcg, with a tolerable maximum of 1000 mcg/day. Folate deficiency is associated with neural tube defects. In patients with a history of a previous pregnancy with neural tube defects, supplementation with 4 mg/day of folate starting one month before conception and during the first trimester reduces the risk of defects in a future pregnancy.

Calcium.- During the third trimester of pregnancy, the baby stores about 250 mg of calcium per day. Although hormonal changes lead to increased absorption and uptake of this mineral, it is recommended to increase calcium intake by 600 mg per day during the second half of pregnancy, increasing dairy intake. Calcium deficiency has been linked to the development of preeclampsia.

Iodine.- Iodine deficiency during pregnancy causes fetal hypothyroidism, which leads to conditions such as cretinism, miscarriage, fetal abnormalities, and severe deafness. Thyroid hormones are critical for brain development and maturation. According to the WHO, approximately 20 million people worldwide have brain damage due to maternal iodine deficiency. The vast majority of scientific societies recommend iodine supplementation throughout pregnancy and lactation, with the recommended intake being between 220 and 300 mcg/day, and supplementation should even be started before conception, if possible.

Zinc.- Zinc-deficient diets lead to intrauterine growth retardation, premature birth, and changes in the child's behavior and learning ability. When the deficiency is severe, various mechanisms are triggered that affect embryogenesis and fetal development, causing congenital malformations. Considering that the bioavailability of dietary zinc is relatively low (20%), the recommended daily intake is 20 mg. Zinc supplementation significantly reduces premature births; the main dietary sources are animal-based foods and cereals.⁽⁸⁾

Data provided by the National Institute of Statistics and Census in 2010 indicate that there are 122,301 teenage mothers in Ecuador, of which more than 50 % are located in the Costa region. Approximately 13,378 pregnant adolescents between the ages of 12 and 19 live in the province of Manabí; in many countries, adolescents represent between 20 and 25 % of all pregnancies due to the increasing sexual activity of young people throughout the world, thus increasing the incidence of births in women under 20 years of age.⁽⁹⁾

Treatment

Depending on the results of the diagnosis, there are different treatments; however, there are essential and basic parameters that are detailed below in Table 1:

Table 1. Nutritional Plan on Vitamins: According to the World Health Organization (WHO)

Vitamin	Recommended dose	Aim	Expected Results
Folic Acid	600-800 mcg/day	Prevent neural tube defects in the fetus	Reduction of the risk of birth defects
Iron	60-120 mg/day	Treat and prevent iron deficiency anemia	Increased hemoglobin and energy levels
Vitamin C	85 mg/day	Improve iron absorption	Increased iron absorption in the body
Vitamin B12	2.6 mcg/day	Contribute to the formation of red blood cells	Increased production of red blood cells
Vitamin A	770-1300 mcg/day	Maintain healthy skin and vision	Maintaining eye and skin health
Vitamin E	15 mg/day	Cell protection and tissue repair	Helps in the repair of damaged tissues
Iodine	220-250 mcg/day	Maintain thyroid function	Avoid hypothyroidism and cognitive problems

Eating Habits of the Women at the Health Center: The results of the dietary habits questionnaires showed that many pregnant women had insufficient dietary intake. Consumption patterns were identified that suggested a lack of dietary diversity, such as vegetables, greens, and protein foods. See Table 2.

Table 2. Food group for pregnant women.

Food groups	Pregnant women	Main foods
Farinaceous	4-5	Bread, pasta, rice, legumes, cereals, whole grains, potatoes
Vegetables and greens	2-4	Wide variety depending on the market, including varied salads
Fruit	23	Great variety according to seasons
Dairy	23	Milk, yogurt and cheeses
Protein foods	2	Meats, poultry, fish, eggs, legumes and nuts
Additive fats	3-6	Preferably olive oil and/or seed oil
Water: mains water, mineral water, infusions, non-alcoholic beverages.	4-8 glasses	Mains water, mineral water, infusions, and low-sugar, non-alcoholic beverages

The food groups are shown in Table 3.

Table 3. Food group for pregnant women.

Food groups	12-14	%	15-16	%	17-18	%
Farinaceous	0	0	6	3	6	3
Vegetables and greens	18	9	0	0	20	10
Fruit	20	10	20	10	10	5
Dairy	12	6	6	3	0	0
Protein foods	24	12	0	0	6	3
Additive fats	6	3	24	12	0	0
Water: mains water, mineral water, infusions, non-alcoholic beverages	5	2,5	9	4,5	8	4
Total	85	42,5	65	32,5	50	25

DISCUSSION

The results of this research could provide valuable information on the relationship between healthy eating and anemia prevention in pregnant women in the Quevedo Canton. These results could guide the development of health policies and targeted intervention programs to improve maternal and child health in the region.

Anemia in pregnant women is a topic of great importance from a public health perspective and has been the subject of numerous scientific studies and research. The following is a scientific discussion on anemia in pregnant women, based on the nutritional plan with vitamins and minerals and the daily eating plan, and considering the contributions of other authors.

Importance of Nutrition in Pregnancy and the Prevention of Anemia

Pregnancy is a period in which nutritional demands increase significantly to meet the needs of both the mother and the developing fetus. Nutrient deficiencies, especially iron, folic acid, and vitamin B12, can lead to anemia, a condition that can have serious implications for maternal and fetal health.

It includes a variety of essential nutrients, such as iron, folic acid, and vitamins, which play a key role in preventing and treating anemia in pregnant women. Adequate iron supplementation is essential for increasing hemoglobin levels and treating anemia.

Contributions of Scientific Research

Numerous studies support the link between iron deficiency and anemia in pregnant women. For example, a study published by Milman in 2012 in "The American Journal of Clinical Nutrition" found that iron supplementation was effective in increasing hemoglobin levels in pregnant women with anemia.⁽¹⁰⁾

Additionally, research has shown that folic acid and vitamin B12 are vital for preventing birth defects and contributing to the formation of red blood cells. A World Health Organization (WHO) article notes the importance of folic acid supplementation during pregnancy to reduce the risk of neural tube defects.⁽¹¹⁾

Additional Considerations

It's important to emphasize that the prevention and treatment of anemia in pregnant women is not limited to supplementation alone. Diet plays a crucial role. The daily eating plan provides a source of essential nutrients that complements supplementation. Furthermore, vitamin C, present in the proposed diet, improves the absorption of non-heme iron, present in plant-based foods.

CONCLUSIONS

The review of theories about pregnancy and the risk of anemia demonstrated a clear relationship between nutrition and pregnancy, which allowed us to determine the different aspects to consider in both diagnosis and treatment. The analysis of professional technical documents highlighted the WHO's synthesis of nutrition by food and vitamins, which allows for a broad understanding of the issue and, together with the analyzed theories, to propose alternative solutions to the problem encountered. Eating habits influence the nutrition of pregnant mothers, and timely information on how to prevent anemia in pregnant women is crucial. This is related to the nutrition and vitamins detailed in the daily nutritional and vitamin plan proposed. A variety of essential nutrients, such as iron, folic acid, and vitamins, are included, playing a fundamental role in the prevention and treatment of anemia in pregnant women. Adequate iron supplementation is essential to increase hemoglobin levels and treat anemia.

BIBLIOGRAPHIC REFERENCES

1. Chimbo Oyaque TO. hábitos, concimientos, creencias y tabus alimentarios que influyen en el estado nutricional en la mujeres gestantes y en periodo de lactancia atendidas en el Centro de Salud de Totoras durante el periodo abril- julio del 2016. Universidad UNIANDES. Ecuador[internet]; 2017[citado 20/12/2024]. Disponible en: <https://dspace.uniandes.edu.ec/handle/123456789/6084>
2. Gonzales GF, Olavegoya P. Fisiopatología de la anemia durante el embarazo: ¿anemia o hemodilución? Rev. Peru. Ginecol. Obstet[internet]. 2019[citado 20/12/2024]; 65(4). Disponible en: http://www.scielo.org.pe/scielo.php?pid=S2304-51322019000400013&script=sci_arttext&tlnq=pt
3. Bastos Oreiro M. Anemia ferropénica. Tratamiento. Rev. Esp Enferme Dig[internet]. 2009[citado 20/12/2024]; 101(1): 70. Disponible en: <https://scielo.isciii.es/pdf/diges/v101n1/paciente.pdf>
4. De la Hoz FE, Orosco Santiago L. Anemia en el embarazo, un problema de salud que puede prevenirse. Medicas UIS[internet]. 2013[citado 20/12/2024]; 26(3). Disponible en: http://www.scielo.org.co/scielo.php?pid=S0121-03192013000300005&script=sci_arttext
5. Arteaga G. ¿Qué es la investigación de campo. Definición, métodos, ejemplos y ventajas. testsiteforme [internet]; 2022[citado 20/12/2024]. Disponible en: <https://www.testsiteforme.com/investigacion-de-campo/>.

6. Torres Rios L. hábitos alimentarios y anemia ferropénica en niños de 1 a 5 años atendidos en el CS San Antonio Chiclayo 2022 Universidad Señor de Sipán Perú [internet]; 2023 [citado 20/12/2024]. Disponible en: <https://repositorioslatinoamericanos.uchile.cl/handle/2250/6381845>
7. Reynaga Atoche EF. Nivel De Conocimiento Y Adherencia A La Suplementación Conjunta Hierro Y Ácido Fólico En Gestantes Del Centro De Salud María Teresa De Calcuta 2020. Lima- Perú: Universidad Nacional Federico Villarreal [internet]; 2020 [citado 20/12/2024]. Disponible en: <https://repositorio.unfv.edu.pe/handle/20.500.13084/4209>
8. Orane Hutchinson AL. Requerimientos nutricionales en el embarazo y donde suplirlos. Rev CI EMed UCR [internet]. 2016 [citado 20/12/2024]; 6(IV): 12-18. Disponible en: <https://revistas.ucr.ac.cr/index.php/clinica/article/view/26928/27104>
9. Zamora Cevallos AL, Poliso Gómez FE, et al. Nutrición y anemia en las gestantes adolescentes. RECIAMUC [internet]. 2018 [citado 20/12/2024]; 2(3): 8-9. Disponible en: [https://doi.org/10.26820/reciamuc/2.\(3\).septiembre.2018.212-228](https://doi.org/10.26820/reciamuc/2.(3).septiembre.2018.212-228)
10. Milman N. Fisiopatología e impacto de la deficiencia de hierro y la anemia en las mujeres gestantes y en los recién nacidos/infantes. Rev peru ginecol obstet [internet]. 2012 [citado 20/12/2024]; 58(4). Disponible en: http://www.scielo.org.pe/scielo.php?script=sci_arttext&pid=S2304-51322012000400009
11. de Pediatría, Sociedad Argentina, and Comités Subcomisiones. "Deficiencia de hierro y anemia ferropénica. Guía para su prevención, diagnóstico y tratamiento." Arch Argent Pediatr [internet]. 2017 [citado 20/12/2024]; 115(4): s68-s82. Disponible en: https://sap.org.ar/uploads/consensos/consensos_deficiencia-de-hierro-y-anemia-ferropenica-guia-para-su-prevencion-diagnostico-y-tratamiento--71.pdf