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Anemia in Pregnancy Consequences and Challenges

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Abstract

Anemia during pregnancy is a public health challenge facing the world today, especially in developing countries. Normal physiologic changes in pregnancy affect poor nutrition, iron and folate deficiencies, and other diseases like malaria. Approximately 75% of all anemia diagnosed during pregnancy is due to iron deficiency. WHO has estimated that the prevalence of anemia in pregnant women is 14% in developed and 51% in developing countries. Anemia with hemoglobin levels less than 6g/dl is associated with poor pregnancy outcomes. Spontaneous abortions, prematurity, low birth weight, and fetal deaths are complications of severe anemia. Treatment of mild anemia with iron and folic supplements prevents more severe forms of anemia, strictly associated with increased risk of fetal-maternal mortality and morbidity.

Keywords: Anemia; Pregnancy; Prevalence; Physiological Changes; Mortality; Morbidity

Introduction

Anemia is a condition in which hemoglobin (Hb) concentration and/or red blood cell (RBC) numbers are lower than normal and insufficient to meet an individual's physiological needs [1]. Pregnancy is a natural phenomenon and a woman's life is not complete until she becomes a mother. Women as supreme creatures of God go through a variety of physiological changes during pregnancy. Changes in the blood circulatory system are particularly notable, permitting normal fetal growth [2]. Among these changes in the hematological system are physiologic anemia, neutrophilia, thrombocytopenia, increased coagulant factors, and decreased fibrinolysis. Normal physiologic changes in pregnancy affect the hemoglobin [3]. Anemia during pregnancy is a considerable health problem, with around two-fifths of pregnant women worldwide being anemic. The World Health Organization (WHO) defines anemia of pregnancy as hemoglobin (Hb) <11s/dl or hematocrit <33%, at any time during the pregnancy [4].

Global data shows that 56% of pregnant women in low and middle-income countries (LMIC) have anemia. It is reported that it has negative maternal and child health effect and increase the risk of maternal and perinatal. The most common true anemia pregnancies are iron deficiency anemia (approximately) and folate deficiency anemia due to inadequate diets and not receiving iron and folate supplements and anemia due to parasitic infections such as malaria, hookworm, or chronic infections like TB and HIV. The negative health effects for the mother include fatigue, poor work capacity, impaired immune function, increased risk of cardiac diseases, reduced peripheral blood reserves, and finally increased risk for blood transfusion in the postpartum period and mortality [5]. The severe form of anemia can lead to various maternal and perinatal adverse effects such as preterm labor, low birth weight, and intrauterine fetal death [6].

Some studies have shown that anemia during pregnancy contributes to 23% of indirect leading causes of maternal mortality in developing countries. There is variation in hemoglobin levels during pregnancy; at the beginning of a pregnancy, there is a normal reduction in hemoglobin level followed by a slight rise towards the end of pregnancy. The initial reduction has been resulting from increased cell mass and demands of the fetus which exceeds iron intake which consequent reduction in iron stores of the women's body [7].

Different interventions have been strengthened to reduce the burden of anemia during pregnancy. The interventions include anemia screening during pregnancy and treatment, giving a combination of folic acid (FeFo) and iron supplements for three months, intermittent prophylaxis treatment for malaria (IPTp) with sulfadoxine-pyrimethamine from 14 weeks, and health education during the antenatal visits [8]. Iron supplementations in pregnancy have become standard as a preventive treatment for anemia in developing countries. In the course of gestation, iron need presents a variation with a growing trend; in fact, there is a lower iron necessity in the first trimester (0.8 mg/day) and a much higher need in the third trimester (3.0-7.5 mg/day). In conclusion, the investigation of acquired anemia's during pregnancy is very important, considering that inadequate nutrition and nutritional deficiencies harm pregnancy outcomes, without excluding a priori other, less common types of anemia [9].

Causes of Anemia during Pregnancy

Iron deficiency (ID) is the most globally prevalent nutritional problem reaching an epidemic level in developing countries; up to 50% of cases results are the results of insufficient iron intake. It is characterized not only by low hemoglobin and hematocrit levels but also by a reduction or depletion of iron stores, low serum iron levels, and decreased transferrin saturation [10]. During pregnancy, the volume of blood increases, this means more iron and vitamin are needed to make more red blood cells. If you don't have enough iron, it can cause anemia. It is not considered abnormal unless your red blood cell count falls too low. The initial reduction has been resulting from increased red cell mass and demands of a fetus that exceeds iron intake with consequent reduction of iron stores of the women's body. Two factors contribute to the development of iron deficiency anemia (IDA) in pregnancy; the first is iron stores at the time of conception and the second is the amount of iron absorbed during gestation [11].

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Frequently, these deficiencies are due to insufficient intake of iron, inadequate absorption, increased losses, expanded requirements, and insufficient utilization of hemopoietic nutrients. Approximately 75% of all anemia diagnosed during pregnancy is due to iron deficiency [9].

Main causes for iron deficiency

Women of reproductive age have monthly menstrual blood and thereby iron losses, during approximately 40 years, having 2-3 pregnancies and child deliveries; which cause further iron losses due to iron depletion and bleeding at delivery. This is the fundamental cause for the high frequency of ID and IDA in women [12].

Folate and Vitamin B_{12} (cobalamin) deficiency

Before nationwide mandatory folate fortification programs, folate deficiency was the second most common cause of anemia during pregnancy. Folic acid helps your body to make red blood cells [13]. If you don't have enough red blood cells, you have anemia. Folate and especially their derivative formyl FH4 are necessary for appropriate DNA synthesis and amino acid production. Low levels of folic acid can cause megaloblastic anemia. The prevalence of folate deficiency in pregnancy varies from 1% to 50% and is higher in economically deprived regions of the world. Numerous studies illustrate that the prevalence of both folic acid and cobalamin deficiency increase with advancing gestation [9,14]. Folate deficiency can result from an inadequate diet, diseases that inhibit folate absorption, certain drugs, and congenital disorders; it may also be secondary to vitamin B_{12} deficiency [15]. Both folate and vitamin B_{12} deficiency contributes to birth defects, such as neural tube abnormalities, and could lead to preterm labor [16,17].

Other causes of anemia comprise pathological conditions like anemia of inflammatory diseases, gastrointestinal infections or disorders as well malabsorption.

Prevalence of anemia in pregnancy

WHO has estimated that the prevalence of anemia in pregnant women is 14% in developed and 51% in developing countries. According to WHO; the prevalence of mild, moderate, and severe anemia during pregnancy accounted for 68%, 74.3%, and 54.5%, respectively. It is estimated that worldwide 40% anemic with iron deficiency and approximately 20% of maternal death occurs. Women who had secondary or higher education were less likely to be anemic compared to their counterparts [18]. A study by the Nutrition Foundation of India and ICMR Task Force observed the prevalence of anemia as 84% and 84.9% among pregnant women, respectively [19]. The global prevalence of anemia in pregnancy is estimated to be approximately 41.8% and India had the highest prevalence of anemia in pregnancy mention that contributes to about 80% of the maternal deaths due to anemia in South Asia and is the home of the largest number of anemic pregnant women in the world. Anemia in pregnancy was recognized as a major public health problem in India leading to high maternal morbidity and mortality, low birth weight, and high infant mortality [20].

Risk factors for anemia during pregnancy

It may occur due to frequently Vomiting due to severe morning sickness, getting pregnant soon after your last pregnancy, being pregnant with more than one baby, having a history of anemia or a heavy menstrual flow, not consuming enough iron, vitamins (vitamin B_{12}, vitamin C or vitamin B9, which is folate) in your diet and an underlying condition, such as thyroid disease [21].

Consequences

Maternal effects of anemia

Anaemia has many maternal complications including cardiovascular symptoms, reduced physical and mental performances, reduced immune function, and fatigue [22]. Women with mild or moderate anemia often tend to be asymptomatic; as anemia advances, the symptoms of fatigue, irritability, generalized weakness, shortness of breath, frequent sore throats, breathlessness, headache (frontal), brittle nails, unusual craving, decreased appetite, maternal iron stores depletion during the postpartum period and dysphagia may occur. In more severe cases, especially in pregnant women with hemoglobin levels less than 6 g/dl, significant life-threatening problems secondary to high-output congestive heart failure and decreased oxygenation of tissues, including heart muscle may be encountered [16,10,23]. They also have an increased risk of developing a perinatal infection, pre-eclampsia, postpartum depression, bleeding, placenta previa or abruptio placenta, operative delivery, and postpartum hemorrhage [24]. Severe anemia is the cause of 40% of maternal deaths in undeveloped countries. It makes the immune status of pregnant women worse: prevalence of morbidity due to infections is doubled in women with Hb below 8 g/dl; anemia [25].

Effects of anemia on the fetus

Anemia in pregnant women has been considered harmful for fetal growth and fetal outcome. Adverse perinatal outcomes include intrauterine growth retardation, prematurity, low birth weight, intrauterine death, amnion rupture; neural tube defects and preterm delivery have been persistently linked to anemia in pregnancy. Nutritional status during pregnancy, especially in late pregnancy, has been linked to the birth weight of the baby [18,23,26]. A mild iron deficiency shouldn't affect your baby; if it remains untreated and becomes more severe during pregnancy especially in the first two trimesters is linked to an increased risk of a baby being born with low birth weight. Whereas having severe iron-deficiency anemia may increase the risk of stillbirth and newborn death [27]. Anemia may enhance the risk of a baby with developmental delays and having a serious birth defect of the spine or brain [19]. In a large epidemiologic study, it was shown that the risk of preterm delivery was increased by 20% in pregnancies with Hb levels between 9 and 10 g/dl and by 60% in pregnancies with Hb levels between 7 and 9 g/dl. Iron deficiency during the first trimester has a more negative impact on fetal growth than anemia developing later in pregnancy; and also lowered iron stores of the newborn child may persist for up to one year which may result in iron deficiency anemia. Infants and young children with anemia are at risk of developmental difficulties involving cognitive, social-emotional, and adaptive functions. Also, cause delays in both language and motor development [28].

Challenges

Improving the quality of maternal and other reproductive health-related services is a programmatic challenge in poor countries. A highly populated country like India has not gained momentum and the health sector has given importance to other emerging health problems, hence anemia has remained a silent disease affecting women and children of reproductive age [28]. Screening for anemia and iron-folate therapy in appropriate doses and route of administration for prevention and management of anemia is still facing major challenges to overcome this. It is difficult to estimate the extent of women's malnutrition, even in pregnant women, in developing countries because few nationally representative studies have been done [29].

All South Asian countries have programs to overcome anemia in pregnancy. India was the first developing country to take up the national nutritional prophylaxis program among the South Asian countries of iron-folic supplementation to prevent anemia among pregnant women and children. The National Nutritional Anaemia Prophylaxis Programme (NNAPP) was initiated nationwide as a measure to prevent anemia in the country but faces major challenges of poor coverage due to inadequate supplies, poor compliance for IFA tablets, lack of community awareness, and no supervision and monitoring done [28,30]. Over the past 25 years, great strides have been made in maternal and newborn health the number of maternal and newborn deaths fell 47% between 1990 and 2015. However, of the nearly 127 million women who give birth every year in developing regions, 28% (35 million women) do not deliver their babies in a healthcare facility and 37% (47 million women) do not receive the recommended minimum of four antenatal care visits, jeopardizing their health and the health of their newborns [30].

Conclusion

Anemia remains to be a problem with multifactorial causes. Therefore, adequate iron and folic intake are crucial for a healthy pregnancy. However, adequate nutrition may not be possible in many developing countries. Hence, there is a need to use multiple interventions, comprehensive approaches for addressing major preventable causes of anemia. Iron supplementation should be considered early in these cases. There is an increasing need for public health strategies to educate the population as to the need for a healthy diet and iron supplementation before conception, or at least at the beginning of the pregnancy. And also providing long-term weekly iron supplements and dietary modifications beginning with adolescence for improving the hemoglobin level as to prevent anemia in pregnancy.

Reference

1. Chaparro CM, Suchdev PS (2019) Anemia epidemiology, pathophysiology, and etiology in low- and middle-income countries. Ann N Y Acad Sci 1450: 15-31.
2. Prakash S, Yadav K (2015) Maternal Anemia in Pregnancy: An Overview. Hum J 4: 1-16.
3. Alghamdi A (2016) Prevalence of Anemia among Pregnant Women in Riyadh, Saudi Arabia. Int J Health Sci & Res 6:1-11.
4. Tandon R, Jain A, Malhotra P (2018) Management of Iron Deficiency Anemia in Pregnancy in India. Indian J Hematol Blood Transfus 34: 204-15.
5. Stephen G, Mgongo M, Hashim TH, Katanga J, Stray-Pedersen B, et al. (2018) Anaemia in Pregnancy: Prevalence, Risk Factors, and Adverse Perinatal Outcomes in Northern Tanzania. Anemia 2: 1846280.
6. Adam I, Ali AA (2016) Anemia during Pregnancy. Nutri Deficiency: 1846280.
7. Osungbade KO, Oladunjoye AO (2012) Preventive Treatments of Iron Deficiency Anaemia in Pregnancy: A Review of Their Effectiveness and Implications for Health System Strengthening. Anemia and Iron Deficiency in Pregnancy: 454601.
8. Sifakis S, Pharmakides G (2000) Anemia in pregnancy. Ann N Y Acad Sci 900: 125-36.
9. De Andrade Cairo RC, Silva LR, Bustani NC, Marques CDF (2014) Iron deficiency anemia in adolescents; a literature review. Nutr Hosp 29: 1240-9.
10. Mc Mahon LP (2010) Iron deficiency in pregnancy. Obstet Med 3: 17-24.
11. Milman N (2015) Iron Deficiency and Anaemia in Pregnant Women in Malaysia – Still a Significant and Challenging Health Problem. J Preg Child Health 2: 168.
12. Hopkins J (2000) Folate Deficiency Anemia. Hopkins medicine.
13. Achebe MM, Gili AG (2017) How I treat anemia in pregnancy: iron, cobalamin, and folate. Blood. 129: 940-9.
14. Coffey-Vega K, Gentili A (2021) Folic Acid Deficiency. Medscape.
15. Talaulikar VS (2014) Anemia in pregnancy. The Global Library of Women's Medicine.
16. Abu-Ouf NM, Jan MM (2015) The impact of maternal iron deficiency and iron deficiency anemia on child's health. Saudi Med J 36: 146-9.
17. Di Renzo GC, Spano F (2015) Iron Deficiency Anemia in Pregnancy. SAGE Journal. November 1, 2015.
18. Johnson TC (2020) Anemia in Pregnancy. WebMD Medical. June 12, 2020.
19. Bansal R, Bedi M, Kaur J, Kaur K, Shergill HK, et al. (2020) Prevalence and factors associated with anemia among pregnant women attending antenatal clinic. J of Med Sci & Res 2: 42-8.
20. Agarwal KN, Agarwal DK. (2006) Prevalence of anemia in pregnant and lactating women in India. Indian J Med Res 124: 173-84.
21. De Bellefonds C (2021) How to Prevent and Treat Anemia. Pregnancy.
22. Akhtar M, Hassan I (2012) Severe Anaemia during Late Pregnancy. Obstetrics and Gynecology. September 2012: 485452.
23. Abu-Ouf NM, Jan MM (2015) The impact of maternal iron deficiency and iron deficiency anemia on child's health. Saudi Med J 36: 146-9.
24. Marple K (2015) Iron-deficiency anemia in pregnancy. Society for Maternal-Fetal Medicine.
25. Ghidini A (2017) Anemia. Cardiology.
26. Garzon S, Cacciato PM, Certelli C, Salvaggio C, et al. (2020) Iron Deficiency Anemia in Pregnancy: Novel Approaches for an Old Problem. Oman Med J 35: e166.
27. Noronha JA, Al Khasanwneh E (2012) Anemia in Pregnancy- Consequences and Challenges: A Review of Literature. J South Asian Federation of Obst & Gyn 4: 64-70.
28. Mora JO, Penelope S Nestel PS (2000) Improving prenatal nutrition in developing countries: strategies, prospects, and challenges. The Am J Clin Nutr 71: 1353S-63S.
29. Kapil U, Kapil R, Gupta A (2019) National Iron plus Initiative: Current status & future strategy. Indian J Med Res 150: 239-47.
30. Schaffer K (2018) Improve Maternal and Newborn Health and Nutrition. Family Care Int.