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Original Research Article

Frequency of iron deficiency anemia in 3rd trimester of pregnancy

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Abstract: ***Background:*** During pregnancy iron deficiency anemia is a significant public health concern worldwide. It has serious consequences for the mother and the fetus. ***Objective:*** The objective of this study was to find out the frequency of iron deficiency anemia in 3rd trimester of pregnancy. ***Methodology:*** The present cross-sectional study was carried out at DHQ Hospital Landikotal from January 2023 to June 2023 after taking approval from the ethical committee of the hospital. For data collection non probability sampling technique was used and the sample size was determined using WHO calculator. Women of different age groups within their 3rd trimester of pregnancy who were willing to participate in the study were included in this study. Demographic data, obstetric history, and information on iron supplementation were collected using a standardized questionnaire. For data analysis SPSS version 25 was used. ***Results:*** A total of 200 women in their 3rd trimester of pregnancy were enrolled. The mean age of the study population was 28.38±8.77 (ranged (16-42) years. The frequency of anemia was observed in the 110(55%) of the total participants. Out of which 90% had iron deficiency anemia followed by folate deficiency 5.4% and combined iron and folate deficiency 3.6% respectively. 55% of women had mild anemia, 30% had moderate anemia, and 5% had severe anemia. A number of dietary risk factors associated to iron deficiency anemia included not 90% eating eggs, 95% meat, 100% fish, or 85% vegetables, as well as not taking supplements of iron throughout pregnancy (92%). These factors are statistically significant and associated with anemia during pregnancy (value of p <0.001) ***Conclusion:*** The present study concluded that iron deficiency anemia was most prevalent during the 3rd trimester of pregnancy. Women of childbearing age, but especially pregnant mothers, should be encouraged to eat foods high in iron.

Keywords: Trimester; Pregnancy, anemia, Iron Deficiency.

INTRODUCTION

Anemia during pregnancy is a significant public health concern that affects more than 20% of women globally. The hemoglobin (Hb) level less than 11 g/dL is the cutoff threshold for pregnant anemia, according to WHO. The cutoff levels for each trimester and the postnatal period have been established by the Centers for Disease Control. For example, <11 g/dL throughout the first and third trimesters, <10.5 g/dL during the second trimester, and <10 g/dL during the postnatal period.[1-3] Pregnancy-related anemia has serious consequences for the mother and the fetus alike. Numerous negative effects on the mother and fetus may result from this. Preterm labor, low birth weight, intrauterine growth restriction (IUGR), and placental absorption are a few examples. Additionally, it is a major risk factor for maternal death and morbidity. The mother is likely to have symptoms including palpitations, dyspnea, cardiac compensation, and heart failure if she has severe anemia. Anemia is the second most common cause of maternal mortality in Asia, accounting for a sizable portion of postpartum hemorrhage fatalities.[4-5] Moreover; it causes an increase in cardiac output by raising blood and stroke volumes. Corresponding changes in ventilation techniques, heat sources, and temperature also take place.[6] A mean hemoglobin level is shown to decrease during the pregnancy period, typically from 13.3 g/dL to 11 g/dL during the 36th week of gestation. After this, women's Hb values are at their lowest at the 20-week mark of pregnancy. This number stays constant until 30 weeks of pregnancy and slightly rises throughout the third trimester.[7] Without taking iron supplements, a

woman's body needs at least 500 mg of iron per day to satisfy her gestational demands throughout a healthy pregnancy. This iron storage is used up entirely by the end of pregnancy due to the high metabolism that occurs throughout pregnancy. Pregnant women typically require 700–1400 mg of iron. Iron consumption increases daily from 4–6 mg to 6–8 mg.[8] Most of the studies are conducted in different parities and all over different trimesters. The current study was carried out to determine the frequency of iron deficiency anemia in 3rd trimester of pregnancy.

Material and method

The present cross-sectional study was carried out at DHQ Hospital Landikotal from January 2023 to June 2023 after taking approval from the ethical committee of the hospital. For data collection non probability sampling technique was used and the sample size was determined using WHO calculator. The required sample was 200. Women of different age groups within their 3rd trimester of pregnancy who were willing to participate in the study were included in this study. individuals with autoimmune diseases , chronic kidney disease, diabetes, thyroid disorders, hypertension, or those receiving treatment for anemia types other than iron deficiency, individuals with known haemoglobino pathies or bleeding disorders were excluded from the study. To collect data clinical assessments, structured interviews, and medical record reviews were recorded. Demographic data, obstetric history, and information on iron supplementation were collected using a standardized questionnaire. Automated hematology analyzers were used to evaluate hemoglobin (Hb) levels as part of clinical evaluations. For iron deficiency anemia during the 3rd trimester a serum ferritin concentration less than 11 g/dL were employed as diagnostic criteria for iron deficiency anemia.Iron deficiency anemia were categorized as severe (Hb less than 7 g/dL) moderate (Hb 7 to 9.9 g/dL) and mild (Hb 10 to 10.9 g/dL). For data analysis SPSS version 25 was used. Demographic and clinical features were summarized using descriptive statistics. Frequencies and percentages were found out for categorical variables. Continuous variables were presented in the form of means ± and standard deviation. To compare categorical variables Chi-square tests were used. The p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 200 women in their 3rd trimester of pregnancy were enrolled. The mean age of the study population was 28.38±8.77 (ranged (16-42) years. Out of the total participants 150(75%) were multigravida and 50(25%) were primigravida women. On the basis of education status majority of the women were uneducated 125(62.5%) and only 75 (37.5%) women were educated. **table 1.**The frequency of anemia was observed in the 110(55%) of the total participants. Out of which 100(90%) had iron deficiency anemia followed by folate deficiency 6(5.4%) and combined iron and folate deficiency 4 (3.6%) respectively as presented in **figure 1.** 55% of women had mild anemia, 30% had moderate anemia, and 5% had severe anemia as presented in table 2. A number of dietary risk factors associated to iron deficiency anemia included not 90% eating eggs, 95% meat, 100% fish, or 85% vegetables, as well as not taking supplements of iron throughout pregnancy (92%). These factors are statistically significant and associated with anemia during pregnancy (value of p <0.001)

Table 1.Demographic features of the study population N= 200

Features	Frequency /percentage
Mean age in years	28.38±8.77
Level of education	
Uneducated	125 (62.5%)
Educated	75 (37.5%)
Gravidity	
Primigravida	50(25%)
Multigravida	150(75%)

Table 2.Frequency of severe, mild and moderate anemia

Anemia	Percentage
Severe	5%
Mild	55%
Moderate	30%

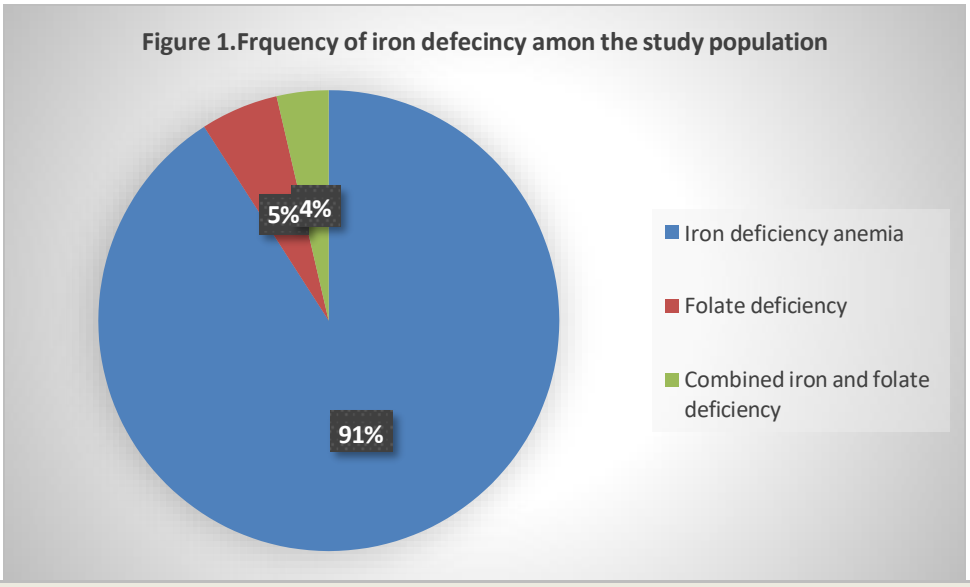

Table 3. Iron deficiency anemia cases' distribution according to different dietary risk factors=100

Risk factors	Present (n/%)	Absent (n/%)	P value
Regular use of Iron supplements	8(8%)	92(92%)	<0.001
Regular use of vegetable/ fruits	15(15%)	85(85%)	<0.001
Regular use of eggs in diet	10(10%)	90(90%)	<0.001
Regular use of fish in diet	Zero	100(100%)	<0.001
Regular use of meat in diet	5(5%)	95(95%)	<0.001

DISCUSSION

Anemia is a significant cause of morbidity and mortality in a number of developing countries, where it affects around two-thirds of the population. It is one of the most common conditions affecting pregnant.9The definition of anemia in pregnancy is defined as a hemoglobin concentration below 110 g/L at sea level. . A hemoglobin level below 70 g/L requires immediate medical attention, and a level below 40 g/L can result in congestive heart failure, infection, and eventually death.10 Pregnancy causes a number of physiological and metabolic changes in the female body. It involves modifications to the mother's physiology as well as the production of several placental and fetal hormones necessary for pregnancy. Additionally, it causes an increase in the volume of blood and stroke, which raises cardiac output.11 The temperature, heat sources, and ventilation techniques also change in a similar way. It has been noted that throughout the pregnancy period, the mean hemoglobin level decreases from 13.3 g/dL to 11 g/dL, which is typical at thirty-six weeks of gestation. After this, women's Hb values are at their lowest at the 20-week mark of pregnancy. This number stays constant until 30 weeks of pregnancy and slightly rises throughout the third trimester.12 Without taking iron supplements, a woman's body needs at least 500 mg of iron per day to satisfy her gestational demands throughout a healthy pregnancy. This iron storage is used up entirely by the end of pregnancy due to the high metabolism that occurs throughout pregnancy. Pregnant women typically require 700–1400 mg of iron. The amount of iron used daily increases from 4–6 mg to 6–8 mg. Anemia's incidence and prevalence in Pakistan have been estimated by various research to be between 26.66% and 90.5%.13-14 This study was carried out to determine the frequency of iron deficiency anemia in 3rd trimester of pregnancy. A total of 200 women in their 3rd trimester of pregnancy were enrolled. The mean age of the study population was 28.38±8.77 (ranged (16-42) years. Out of the total participants 75% were multigravida and 25% were primigravida women. On the basis of education status majority of the women were uneducated 125(62.5%) and only 75 (37.5%) women were educated. Similar pattern of demographics were seen in the study conducted by Begum et al.in which the mean age was 27.27±7.66 years and majority of the study participants completed their primary education which support our study.15 In our study 90% of the pregnant women in their 3rd trimester of pregnancy had iron deficiency anemia. Our study findings are similar to the study conducted by Ashraf, Bushra in which the prevalence was 89.6%.16 According to many local studies conducted in Pakistan, the prevalence of pregnant anemia varies and can reach 75.2%. 50% of pregnant Pakistani women had hemoglobin levels less than 11.0 g/dL, according to WHO national estimates, while 2.1% had hemoglobin levels less than 7.0 g/dL.17-18 The prevalence of anemia in 3rd trimester of pregnancy in our study is higher than what has been documented in a number of advanced

countries. For example, the frequency was 31% in Belgium 19 and 22% in the USA.20 Developing countries like Bangladesh (50%) and India (84.9%) have recorded even similar occurrences.21-22 In our study 55% of women had mild anemia, 30% had moderate anemia, and 5% had severe anemia. The results of our study are similar to the previous study conducted by Ashraf in which the most prevalent was mild anemia followed by moderate and severe anemia.16 The results of this study evaluated that a number of dietary risk factors associated to iron deficiency anemia included not eating eggs, meat, fish, vegetables, as well as not taking supplements of iron throughout pregnancy. Previous study also examined the same risk factors which support our reseach.16 Iron deficiency can be caused by a number of different factors. For example, poor iron absorption and nutritional deficiencies brought on by inflammatory bowel illness or diets heavy in phytates. In addition, there are worm infestations, infections, gynecological conditions related to significant blood loss, insufficient iron body reserves before to pregnancy, and increased iron demand during pregnancy or after blood donation.23 Inadequate iron levels are not the only cause of pregnancy anemia. These include shortages in vital micronutrients including folic acid, vitamin A, or vitamin B12, as well as parasite infestations including malaria, hookworm infections, as well as schistosomiasis. Anemia can also result from genetically inherited disorders such as sickle cell disease, thalassemia, and glucose-6-phosphate dehydrogenase (G-6-PD) deficiency. Rheumatoid arthritis, TB, chronic renal failure, and bone marrow disorders that prevent the generation of red blood cells can also result in anemia. Hemolysis, increased liver enzymes, and a low platelet count are the hallmarks of HELLP syndrome, a disorder that can develop in the latter stages of pregnancy or after delivery. This condition might have pregnancy-induced hypertension (PIH) as a contributing factor.24 Women in their third trimester of pregnancy had the greatest prevalence of pregnancy anemia in this study. Anemia is more common in the second and third trimesters of pregnancy, according to several published research. Anemia may become more obvious as gestational age increases since there is a corresponding rise in plasma volume.25 Due to the high prevalence of iron deficiency in our community. People of childbearing age, but especially expectant mothers, should be encouraged to eat foods high in iron. For example, veggies, seafood, red meat, and eggs. They should refrain from concurrently consuming items that prevent the intestines from absorbing iron. Interventions to address the issue from a national viewpoint should be a part of the prenatal care programs. For the impoverished communities, these include nutritional diversity and fortification. Furthermore, it is critical that the healthcare staff be aware. They should understand that treating an established iron shortage requires the use of supplementary iron in addition to a better diet. The preferred preparations are ferrous iron salts, including ferrous gluconate, ferrous fumarate, and ferrous sulphate. For iron deficiency anemia, 40–80 mg of basic iron per day should be taken orally. For women who do not react to or are intolerant to oral iron, or for those with severe iron deficiency anemia starting in the second trimester, intravenous iron is recommended. Transfusion of blood if Hb <70g/l.26

Conclusion

The present study concluded that iron deficiency anemia was most prevalent during the 3rd trimester of pregnancy. Women of childbearing age, but especially pregnant mothers, should be encouraged to eat foods high in iron

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