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FREQUENCY OF IRON DEFICIENCY ANEMIA IN PREGNANT FEMALES COMING FOR THEIR FIRST ANTENATAL WORK UP IN FIRST TRIMESTER OF PREGNANCY

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Abstract

Background: *For both the mother and the fetus, iron deficiency anemia can be fatal. Iron status, however, is not frequently assessed during pregnancy.*

Objective: *The aim of this study was to find out the frequency of anemia due to iron deficiency in pregnant women who were attending their first prenatal visit during the first trimester of their pregnancy.*

Material and methods: *The current cross- sectional study was conducted at the Obstetrics and Gynecology Department of Ayub Teaching Hospital, Abbottabad form 1st April to 30 September 2023 after taking permission from the ethical committee of the institute. A total of 141 pregnant women between 18 to 40 years of age coming to OPD or admitted in ward during their 1st antenatal visit in 1st trimester were included. Anemia in patients were confirmed by history and by examination. A blood sample taken was taken from each individual and had their full blood counts (FBCs) performed using a hematology analyzer under supervision of pathologist fellow of CPSP. A Randox kit was used to measure serum ferritin. Data was analyzed using SPSS version 20.*

Results: *A total of 141 pregnant women of different age groups (18-40 years) during their 1st trimester were screened for iron deficiency anemia in this study. Out of the total participants 72(51%) were found anemic. There were no statistically significant variations in the incidence value across the various age groups during the first trimester (P = 0.32). The mean hemoglobin was 9.502 and serum ferritin, 15.83. 37.5%of the patients had severe IDA, whereas 62.5% percent had mild IDA.*

Conclusion: *The current study concluded that iron deficiency anemia is prevalent during pregnancy, with the greatest rate observed in the first trimester. It is still a serious public health concern during pregnancy, and a sizable percentage of anemia in this population is related to iron deficiency. Serious consequences are associated with the iron deficiency anemia on the health of both mother and the developing baby. Theses consequences include increased perinatal mortality, stunted growth, premature births and low birth weight. This all can be prevented by replenishing iron stores of mother. Hence it is indispensable to educate women regarding health promotion.*

INTRODUCTION

The World Health Organization defines anemia in pregnancy as a condition when a woman's haemoglobin (Hb) level is below 11 g/dl.[1] Although it is classified in a variety of ways, the MCV (mean corpuscular haemoglobin) values are the most often used. MCV typically ranges from 80 to 100 fl. MCV is classified as microcytic anemia if it is below 80 fl and as macrocytic anemia if it is greater than 100 fl. Microcytic anemia is a type that includes iron deficiency anemia (IDA).[2] The World Health Organization reports that the prevalence of anemia is 51% in underdeveloped nations and 14% in advanced countries. [2]. The most prevalent cause of anemia worldwide, iron deficiency anemia (IDA), affects over 32 million women.[3] The prevalence of IDA is believed to be between 20% and 80% globally, with a rate of 77.3% in Pakistan.[5] Pregnancy and menorrhagia are the two main reasons of IDA among adult females, while there are other factors as well. In Pakistan, the incidence of anemia in pregnant women is 76.5%.[2-3] Iron deficiency is especially dangerous for pregnant women since their bodies need a lot more iron to support the growth of the fetus and the expansion of their plasma volume.[4-5] Pregnant women who do not get the extra iron they need will have cells that are unable to perform their duties to the fullest extent possible, which can cause a variety of symptoms, such as weakness and early fatigue.[2] Furthermore, iron deficiency anemia has been linked to pregnancy complications such low birth weight (LBW), postpartum hemorrhage (PPH), abortions, and early deliveries.[6] Iron status has been assessed using a variety of biomarkers. The most therapeutically useful of these during pregnancy is plasma (or serum) ferritin, which has also been suggested as a highly accurate single test for screening for iron storage.[7]A pregnant woman is considered iron deficient if her iron stored (serum ferritin) levels fall below a certain range, <12ng/ml, and her hemoglobin (Hb) level is less than 11g/dl[6] and her MCV is less than 80 fl. [8] It is therefore regarded as one of the most prevalent and avoidable pregnancy problems. The goal of the present research was to find out the frequency of anemia due to iron deficiency in pregnant women who were attending their first prenatal visit during the first trimester of their pregnancy.

Material and methods

The current cross- sectional study was conducted at the Obstetrics and Gynecology Department of Ayub Teaching Hospital, Abbottabad form 1st April to 30 September 2023 after taking permission from the ethical committee of the institute. Non probability consecutive sampling technique was used and sample size was determined through WHO software. A total of 141 pregnant women between 18 to 40 years of age coming to OPD or admitted in ward during their 1st antenatal visit in 1st trimester were included while women with medical disorders like hypertension, diabetes, cardiac disease and chronic renal disease , acute blood loss and underwent blood transfusions in last 3 months were excluded . All the data were collected on a pre-designed pro forma by the candidate himself. Informed written consent were taken from patient/care givers. The privacy implications of the collected information were ensured. Anemia in patients were confirmed by history and by examination. A blood sample taken was taken from each individual and had their full blood counts (FBCs) performed using a hematology analyzer under supervision of pathologist fellow of CPSP. A Randox kit was used to measure serum ferritin in confirmed anemic individuals. . Data was analyzed using SPSS version 20. Categorical data like educational status, socioeconomic status and iron supplements taken in last one year, were described in terms of frequencies and percentages. Quantitative variables like age, weight, and BMI, MCV, HB and serum ferritin were described as mean ± standard deviation. Iron deficiency anemia was stratified by age, weight, BMI, socio economic status, educational status and iron supplements intake. Post stratification on chi-square test was used at 5% level of significance.

Results

A total of 141 pregnant women of different age groups (18-40 years) during their 1st trimester were screened for iron deficiency anemia in this study. Out of the total participants 72(51%) were found anemic **(figure 1).** Anemia was most common in the 30–40 age group (20.5%), followed by the 29–33 age group (20.7%) and the 24-28 age group (18.5%) respectively **(table 1)** . There were no statistically significant variations in the incidence value across the various age

groups during the first trimester (P = 0.32). Analyses were made of the mean, SD of Hb, serum ferritin and MCV. The mean hemoglobin was 9.502, serum ferritin, 15.83 and MCV 72.24 as presented in **table 2.** Most of the patient's anemia effect individuals had completed primary education 48(66.6%), 14(19.4%) were Illiterate and 10(13.8%) had secondary education but none of them had higher education. 25(34.7%) individuals had satisfactory socioeconomic status, 37(51.3%) had poor and 10(13.8%) had very poor socioeconomic status.50 (69.4%) participants of the study population had 3 , 22(30%) had up to 6 and none had more than 7 family members. only 6(9%) of the participants had taken the iron supplements and 66(91%) did not take it. Iron deficiency anemia prevalence and sociodemographic data distribution of the study population is presented in **table 3**. Based on the serum ferritin level, iron deficiency anemia severity was divided into two groups: severe and moderate. 37.5%of the patients had severe IDA, whereas 62.5% percent had mild IDA as presented in **table 4.**

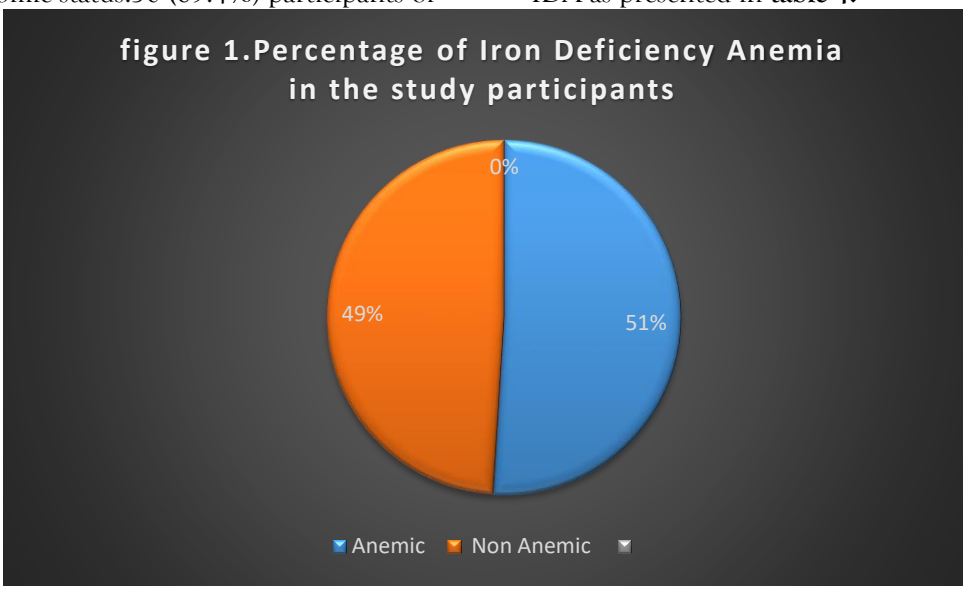

Table 1 Age wise distribution of the anemic individuals first trimester n=72

Age in years	Frequency / percentage
18-23	12(16.6%)
24-28	18(25%)
29 -33	20(27.7%)
34-40	22(30.5%)
Total	72(100%)

Table 2 . Assessment of first-trimester pregnant women based on Hb, serum ferritin, serum iron, TIBC, transferrin saturation, MCV, and MCH n= 72

Parameters	Mean	Standard deviation
Hemoglobin gm/dl	9.502	0.88
serum ferritin	15.83	5.76
MCV	72.24	15.52

Table 3. Iron deficiency anemia prevalence and sociodemographic data distribution of the study population n= 72	
Variable	**Frequency/ Percentage**
Socioeconomic status	
Very poor	10(13.8%)
Satisfactory	25(34.7%)
Poor	37(51.3%)
Family Education	
Illiterate	14(19.4%)
Primary education	48(66.6%),
Secondary education	10(13.8%)
Higher education	Zero (0)
Family size (members)	
3	50 (69.4%)
Up to 6	22(30%)
More than 7	Zero
Iron supplement intake	
Yes	6(9%)
No	66(91%)

Severity	**Number of individuals**	**Percentage**
Moderate serum ferritin 8-12 µg/L	**45**	**62.5%**
Severe serum ferritin < 8µg/L	**27**	**37.5%**

Discussion

Blood hemoglobin, which transports oxygen from the respiratory organ to the other parts of the body, requires iron as a necessary component. Normal biological processes including breathing, cell division, and DNA synthesis depend on iron.[9] Anemia from iron deficiency (ID) can be seen when hemoglobin levels during pregnancy fall below 11 g/dL, which is considered abnormal.[10] Iron deficiency is the most common nutritional issue worldwide, and it is regarded as an epidemic in many developing nations.[11] Insufficient iron absorption during pregnancy has been identified as the cause of approximately fifty percent of ID cases.[12] Iron supplementation becomes more necessary in both the 2nd and 3rd periods due to fetal development. Gastrointestinal fasciculation is insufficient to supply this elevated iron need. Consequently, throughout these phases, iron balance is dependent on parental iron resources.[13] The prevalence of anemia is 43 percent in developing countries and 9% in advanced countries.[14] Iron deficiency anemia's (IDA) most typical symptoms are exhaustion, fainting, and breathing difficulties.[12] A considerable risk of developmental problems, including cognitive, social emotional, and adoptive functions, exists for infants and young children who suffer from anaemia.[15] Pregnant women from poor socioeconomic backgrounds are more likely to have anemia in various regions of the world.[16] Screening for iron deficiency anemia is crucial in pregnancy for both mother and the fetus. Therefore the current study was conducted to find out the frequency of iron deficiency anemia in the pregnant women in first trimester of pregnancy. In the current study the overall prevalence was 51% these findings are similar to the study conducted by Atta, et al [17]in which they reported 52% prevalence of iron deficiency anemia in the pregnant women in their first trimester of pregnancy. But these results are in contrast with the study conducted by Al Qurashi, Wejdan S., et al.[18] they reported 28% prevalence. The primary difference between our study and several

previously published studies is that ours was cross sectional, whereas the earlier investigations were longitudinal. In the current study the most prevalent age group of anemic individuals was 30-40 years 22(30.5%) followed by age group 29 -3320 (27.7%) and 24-28 age group 18(25%) respectively. These results are similar to the privies study.[17] In our study Most of the patient's anemia effect individuals had completed primary education 48(66.6%), 14(19.4%) were Illiterate and 10(13.8%) had secondary education but none of them had higher education which show similarity with the study conducted by Emad, et al [19]. Uneducated peoples are unsure of the significance of an iron test during pregnancy, and are not taught about maintaining a balanced diet. In the current study 37.5%of the patients had severe IDA, whereas 62.5% percent had mild IDA which similar with the findings of Atta, et al.[17]

Conclusion

The current study concluded that iron deficiency anemia is prevalent during pregnancy, with the greatest rate observed in the first trimester. It is still a serious public health concern during pregnancy, and a sizable percentage of anemia in this population is related to iron deficiency. Serious consequences are associated with the iron deficiency anemia on the health of both mother and the developing baby. These consequences include increased perinatal mortality, stunted growth, premature births and low birth weight. This all can be prevented by replenishing iron stores of mother. Hence it is indispensable to educate women regarding health promotion.

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