ORIGINAL ARTICLE DOI: https://doi.org/10.52206/jsmc.2024.14.4.834 OPEN ACCESS

Multigravidae and Iron Deficiency Anemia: First Visit Statistics

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ABSTRACT

Background: Iron deficiency anemia (IDA) remains a global public health concern, affecting individuals across the lifespan with 50% to 75% cases of anemia affecting pregnancy.
Objective: To determine the occurrence of iron deficiency anemia in multigravidae at their first booking visit.
Materials and Methods: In this descriptive cross sectional study, a total of 310 patients were enrolled. The study included multigravidae of reproductive age and excluded those with hemoglobinopathy, recent blood transfusions and medical disorders during pregnancy.
Results: Our study showed that among 310 patients, mean age was 31±13.91. Mean Hemoglobin level was 11 g/dl ±10.53. Mean S.Ferritin was 27±14.73 .72% of patients had iron deficiency anemia.
Conclusion: Our study concludes that the incidence of iron deficiency anemia was found to be 72% in multigravida at their first booking visit in our setup.
Keywords: Hemoglobin(Hb), Iron deficiency anemia, Multigravida,

This article may be cited as: Gulnaz, Kishwar N, Sadaf R, Karim R, Tabassum S. Multigravidae and Iron Deficiency Anemia: First Visit Statistics. J Saidu Med Coll Swat. 2024;14(4):285-289. DOI: https://doi.org/10.52206/jsmc.2024.14.4.834

INTRODUCTION

Iron deficiency anemia (IDA) remains a global public health concern, affecting individuals across the lifespan, with pregnant women being particularly vulnerable. Multigravida women, whose health during pregnancy is of paramount importance, represent a distinct group of obstetric population with repeated pregnancies. By definition concentration of hemoglobin less than 11 gm/dl during pregnancy and less than 12gm/dl outside pregnancy is termed as Anemia.[1] Anemia in pregnancy is further categorized mild, moderate and severe with hemoglobin concentration (10-10.9 g/dL), (7.0-9.9 g/dL) and (<7 g/dl) respectively.

Anemia affects a substantial portion of the global population, with approximately 1.6 billion people, constituting 24.8% of the world's population.[2] According to the World Health Organization (WHO) report, the global prevalence of anemia in women of reproductive age (1549 years) is 29.9%.[3] In developing nations, the prevalence varies between 43% and 56%, contrasting with the lower estimate of 9 to 18% in developed countries. In Asian countries, the prevalence is 44% in non-pregnant and 60% in pregnant women.[4] According to WHO, a prevalence of 4.9% or less is considered a non-public health problem, while 40% or more is deemed a severe public health issue. Numerous studies highlight the dependence of antenatal maternal anemia on factors such as socioeconomic status, literacy, extremes of maternal age, multiparity, short pregnancy intervals, and gestational age.[5]

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Received: November 27th, 2023 - 1st Revision: March 29th 2024
2nd Revision: July 04th 2024 - 3rd Revision: July 15th 2024
Accepted: August 04th, 2024

Iron deficiency anemia stands as the predominant nutritional deficiency during pregnancy, contributing to 50% to 75% of all cases of anemia and exerting a substantial impact on both maternal and fetal morbidity and mortality. A significant portion of the Pakistani population grapples with iron deficiency anemia, a condition closely linked to increased risks of maternal, fetal, and neonatal mortality. Furthermore, it is associated with adverse pregnancy outcomes, including low birth weight and preterm birth, along with implications for birth weight, impaired cognitive development, reduced learning capacity, and diminished school performance in children. The consequences extend into adulthood, contributing to decreased productivity, particularly in the context of developing countries.[3,6]

Iron is an essential micronutrient critical for the production of hemoglobin, which transports oxygen to tissues and organs. During pregnancy, iron requirements increase substantially to cop up with the expanding blood volume and fetal development. Failure to meet these increased iron demands can lead to iron deficiency anemia, which poses substantial risks to both maternal and fetal health.[7]

As multiparity is a risk factor for iron deficiency anemia, multigravidae may face unique challenges in maintaining adequate iron levels due to the cumulative impact of multiple pregnancies. Moreover, early detection and intervention are key to preventing the adverse outcomes associated with IDA. By focusing on the first booking visit, when prenatal care begins, we aim to identify opportunities for early intervention and support that can benefit both mother and child.

The aim of this study is to determine the frequency of iron deficiency anemia in multigravida so that effective strategy can be adopted to overcome this preventable and treatable risk and so will help to modify the outcome of pregnancy.

MATERIALS AND METHODS

This study was conducted at the Gynecology Department of Hayatabad Medical Complex (HMC) from 1st March 2019 to 31st December 2019. Sample size was 310 calculated by WHO sample size software keeping prevalence of anemia as 72%, 95% confidence interval, and 5% margin of error.[8] We employed a non probability consecutive sampling technique for data collection. The study included pregnant women aged 18 to 45 with two or more pregnancies i.e multigravida, excluding those with hemoglobinopathy, recent blood transfusions, hypertensive disorders, pregnancy diabetes mellitus, multiple gestation and the antepartum hemorrhage. Additionally, women with chronic medical illnesses like Chronic hypertension, Diabetes, chronic kidney disease and autoimmune disease were also excluded.

Operational Definitions

Iron Deficiency Anemia: Defined as Hb <11 mg/dl, MCV <76 fl, MCH <27 pg and serum ferritin <30 µg/L.[9]

Multigravida: women with two or more pregnancies.[10]

Data collection was started after approval of synopsis from the Research and Ethical committee of the institute (Ref; IERB: HMC no 1145/2023). All pregnant women coming for their first antenatal check-up, fulfilling the selection criteria were enrolled after informed consent. Complete history was taken especially focusing on gestational period, parity, any per vaginal or per rectal bleeding, hematuria, worm infestation, comorbidities, birth spacing, blood transfusion, dietary habits and recent surgery. Examination was performed including general physical examination (pallor, jaundice, cyanosis, koilonychia, thyroid), vitals record (BP, Pulse, respiratory rate and temperature). Biodata and all findings were recorded. Departmental ultrasound was done by qualified consultant sonologist to exclude multiple pregnancies. Blood sample was sent to the institutional laboratory (Pathology department) for full blood count, peripheral smear and serum ferritin levels. Test was done from laboratory using absorbance/automatic hematology analyzer 12 parameter method.

All the investigations were done from the same institutional laboratory to maintain uniformity of technique and methods. The data analysis employed SPSS version 22. Mean ± standard deviation were calculated for numerical variables whereas frequency and percentages were computed for categorical variables. Iron deficiency anemia was stratified among hemoglobin, mean cell volume, mean cell hemoglobin and serum ferritin to see effect modification. Chi square test was applied to see effect modification. P-Value ≤0.05 was considered significant. Data was presented in the form of tables.

RESULTS

Total of 310 patients were recruited for this study and their data was analysed. Among these women 177(57%) fell between 15-30 years ,138(43%) were found in age range of 31-45. Mean age was 31 years with SD ±13.91.

Hemoglobin Level among 310 patients was analyzed as 223(72%) patients had hemoglobin level =11 g/dl and 87(28%) patients hemoglobin level >11 g/dl. Mean HB level was 11 g/dl with SD ± 10.53. Mean cell volume among 310 patients was analyzed as 223(72%) patients had cell volume =76 fl and 87(28%) patients had cell volume >76 fl. Mean HB level was 70 fl with SD ± 18.93. Mean cell hemoglobin among 310 patients was analyzed as 223(72%) patients had cell hemoglobin =27 pg and 87(28%) patients had cell hemoglobin >27 pg. Mean cell hemoglobin was 25pg with SD ± 18.93.

Stratification of Iron deficiency anemia with respect to age, hemoglobin, mean cell volume, mean cell hemoglobin and serum ferritin is given in table 02.

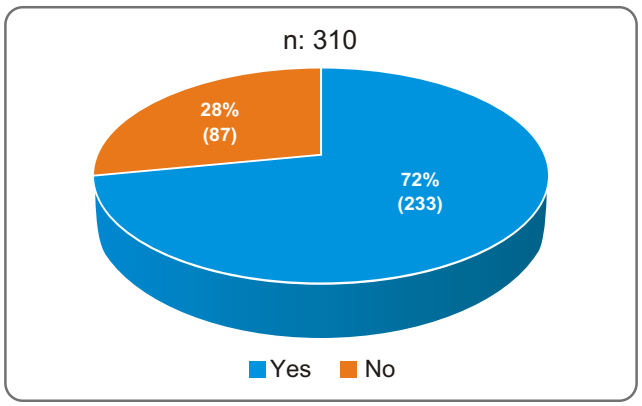


Figure 01. Iron Deficiency Anemia

Table 02. Stratification of iron deficiency anemia with respect todifferent variables (n-310)

Iron Deficiency Anemia		Yes	No	Total	% Age	Mean	SD	P-Value
Age	< 30 Years	127	50	177	57%	31	+ 13.95	0.9337
	> 30 Years	96	37	133	43%			
Total		233	87	310	100%			
Hb	<11	223	0	223	72%	11	+ 10.53	0.0001
	>11	0	87	87	28%			
Total		223	87	310	100%			
MCV	<76	223	0	223	72%	70	+ 18.93	0.0001
	> 76	0	87	87	28%			
Total		223	87	310	100%			
MCH	< 27	223	0	223	72%	25	+ 12.11	0.0001
	> 27	0	87	87	28%			
Total		223	87	310	100%			
S. Ferritin	< 30 µg/Lt	223	0	223	72%	27	+ 14.73	0.0001
	>30 µg/Lt	0	87	87	28%			
Total		223	87	310	100%			

DISCUSSION

In this study anemia among pregnant women attending their first antenatal visit at Hayatabad medical complex is computed as 72%. During antenatal visits, among 310 anemic women iron deficiency anemia was found in 223 women, having hemoglobin less than 11 gm/dl with low ferritin levels.

Study results of Sabina et al[4] and Saeed A[6] are consistent with that of our study i-e 62.5% and 68.4%respectively. In contrast, the prevalence of anemia in a study conducted by Gebreweld Angesom et al[2] was reported as 11.6%(95% CI;7.8%-14.8%), similarly another study done by Dessalegn FN et al[7] showed 19.3% overall prevalence of iron deficiency anemia. A study conducted by Amarasing showed that among 3127 participants, 14.4% were anaemic, their haemoglobin ranged between 7.4 to 19.6g/dl and 331(10.6%) women had mild anaemia.[11] In a study done at India more than half of the pregnant females in that research sample had anemia, indicating a signifcant prevalence of anemia in India.[12] According to research study done by Al Qurashi et al, the overall prevalence of anemia was 28.6% with 12.2% cases recorded in first trimester. The mean hemoglobin was 11.5 in the first trimester.[13] In contrast Khan HA et al reported that prevalence of anemia among pregnant women across all the three trimesters was 3.95%, and the prevalence of mild and moderate-to-severe anemia was 1.04% and 2.90%, respectively.[14] Similarly in another study the prevalence of anemia during the first trimester was 2.9% (119 patients), among these patients, 91 (76.5%) had mild anemia, with an Hb level of =10 g/dL.[15]

In our study of 310 patients, 57% were aged between 15 and 30 years, while 43% fell within the 31 to 45 age range. The mean age was 31 years, with a standard deviation of ±13.91. In Sabina et al study most of the women (51.9%) were between 20-25yrs of age and only 4.2% were above 36years old.[4] Another study reported that the mean age of the participants was 26 ±4.6 years, and slightly more than half of the respondents 194 (57.1%) were in the age interval of 25 to 34years.[16] In a study conducted by Tirore LL, more than quarter (26.34%) of the pregnant women were in the age group of 2024 years. The mean age of the pregnant women was 26.76 ±6.81years.[17] The mean age of the women was 25±4.68 years and ranging from 15 to 42years.[18]

In our study, the mean hemoglobin level was 11 grams per deciliter, with a standard deviation of 10.53. The mean corpuscular volume (MCV) was 70 femtoliters, accompanied by a standard deviation of 18.93. The mean cell hemoglobin was 25 picograms, with a standard deviation of 18.93. Notably, 72% of the patients exhibited iron deficiency anemia.

These findings align with research by Akhter Saeed et al[6] in Multan, where 86 to 96% of multiparous women had hemoglobin levels below 11 grams per deciliter, largely indicating iron deficiency anemia. According to Tirore LL study results, the pooled prevalence of anemia was 51.26% with a median hemoglobin level of 10.9 g/dl (IQR: 9.8, 12 g/dl). More than one fourth (26.8%) and one in ten (1.53%) were moderately and severely anemic, respectively.[17] Susmita S reported 388 females with diagnosis of pregnancy during first

imester having median age of the study group as 27 years and mean hemoglobin concentration as 10.47 gm/dl.[19]

Pregnant women are the most likely population group to suffer from anemia, especially nutritional anemia. Among the pregnant women who were receiving antenatal care at the hospital, 24.4% of controls and 45% of cases were gravida four and above.[2°] Kare AP et al reported that, among 340 pregnant women recruited for the study, 72.1% have a family size of less than 5 in number.[16] On the other hand Balcha WF et al reported seven out of the ten women, 287 (70.0%) were multigravida and 66 (16.1%) had a history of abortion.[18] According to a study conducted by Susmita S, there was high prevalence of anemia multiparous females at the time of diagnosis during first trimester.[19] Likewise an observation of Mishra A, was that multigravidae were more affected by anemia, and 43.80% of anemic patients were not taking iron supplements at the time of diagnosis.[21]

Hemoglobin levels in the first trimester were significantly better predictors of anemia during the third trimester than the other indices. This study contributes to the clinical practice of early intervention for anemia, thus taking effective measures to improve maternal and infant outcomes.[22]

Pregnant women are particularly susceptible to nutritional anemia. Anemia is associated with adverse fetomaternal outcomes. Encouraging and prescribing iron supplementation before, during, and after pregnancy is essential to mitigate the long-term effects of anemia. The significance of reducing and properly managing maternal anaemia has been recognised globally. Current targets which are set in Sustainable Development Goal 3 and 5 Global Nutrition Targets 2025 call for a 50% decrease of anaemia in women of reproductive age by the year 2025.[23]

Our study's strength lies in its exclusion of high risk pregnancies, which could have otherwise skewed the results.The study's limitations in achieving generalizability include its small sample size, restricted timeframe, and sole reliance on a single center. To enhance the applicability of the findings, future research should consider broader studies with larger sample sizes.

CONCLUSION

Our study concludes that the incidence of iron deficiency anemia was found to be 72% in multigravida at their first booking visit in our setup.

Recommendations

Patient education, particularly about iron-rich foods and anemia prevention, integrated care from early pregnancy, and promoting iron supplementation and early antenatal care, are essential for effective management of maternal anemia and reducing its prevalence during pregnancy.

Ethical Consideration

This study was approved by the ethical board of Hayatabad Medical Complex, Peshawar, Pakistan.

Funding

There is no role of any funding agency in this study.

Conflict of Interest

Authors declared no conflict of interest

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DATA SHARING STATEMENT: The data that support the findings of this study are available on request from the corresponding author. The data is not publicly available due to privacy or ethical restrictions.

AUTHORS' CONTRIBUTION

The following authors fullfill authorship criteria as per ICMJE guidelines;

Gulnaz, Kishwar N:	Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Sadaf R:	Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.
Karim R:	Analysis and interpretation of data, drafting the manuscript, final approval, agreed to be accountable for all the work.
Tabassum S:	Analysis and interpretation of data, critical revision,final approval, agreed to be accountable for all the work.

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