A Study of Frequency of Anemia in Pregnant Females in Tertiary Care Hospital, Islamabad

Mohsin Ali Hassni[1], Iqra Jalil[2], Muhammad Mobeen Tariq[3], Huma Abbasi[4], Sunaina Qalander[5], Fazal Bari[6], Muhammad Zia Ul Rahman[7], Zainab Bint e Nasir[8]

[1]Research Scholar, Center for Advance Studies in Vaccinology and Biotechnology, UOB, Pakistan.

[2]Lecturer at Department of Allied Health & Rehabilitation Sciences at IMDC, Islamabad, Pakistan.

[3]Muhammad Mobeen Tariq (Lecturer at Department of Allied Health & Rehabilitation Sciences at IMDC, Islamabad, Pakistan

[4]General Dental Practitioner at Zahid Dental care & Implant centre,

[5]Medical Laboratory Technologist at AKHU, Pakistan

[6]Junior Consultant at SMBZAN Institute of Cardiology Quetta

[7]Medical Laboratory Technologist, Islamabad Diagnostic Center, Pakistan.

[8]Resident Orthodontics Department, AFID, Islamabad, Pakistan.

Corresponding Author: Mohsin Ali Hassni, Email: mohsin.mlt18@imdcollege.edu.pk

ABSTRACT

Background: Anemia is among the most public hematological disorders, especially in pregnancy. It is a nutritional deficiency disorder that affects pregnant women, mainly in underdeveloped countries. Pregnant women who suffer from anemia often have bad pregnancy outcomes and may lead to difficulties that endanger both the mother's and the fetus's health. This study aimed was to determine the frequency of anemia among pregnant women in tertiary care hospitals in Islamabad.

Material and Methods: This cross-sectional investigation was carried out in the Dr. Akbar Niazi Teaching Hospital's pathology and gynecology department in Islamabad. All the pregnant women who visited for antenatal check-ups from January 2021 to December 2021 were involved in the study. Data was taken through a specially designed proforma and statistical analysis was accomplished using SPSS version 21.

Results: A total number of 93 pregnant females were enrolled in the study. The average age of pregnant women was 30.6 ± 6.0 (20-43). The average hemoglobin in our study population was 11.1± 1.4 (8-13 g/dL). The mean range of WBC counts was 11,304/mm3 ±7722 (4100/mm3 - 81000/mm3), the mean value of RBC count was 4.1 mil/mm3 ± 0.6 (2-5 mil/mm3). The overall prevalence of anemia in pregnant females was 45% (n=42). Out of 42 pregnant anemic women, 25 (59%) had normocytic normochromic type of anemia, 15 (36%) had microcytic type of anemia, and 2 (5%) had macrocytic type of anemia. Mild anemia was recorded in 26 (30%) of the pregnant females, while moderate anemia was recorded in 16 (17%) of the pregnant females, and 51 (55%) of the pregnant females had no anemia.

Conclusion: Anemia was found in the majority of pregnant females visiting tertiary care teaching hospitals. The frequency of mild anemia was high and also according to severity. The most common morphological type of anemia was normocytic normochromic. The overall prevalence of anemia in pregnancy was 45% (n=42).55% of pregnant women were non-anemic and new severe anemia was detected.

Keywords: Anemia, Pregnancy, Microcytic, Normocytic, Hematological, WBC, Platelets

INTRODUCTION

Anemia in pregnancy is the most common type of hematological disorder diagnosed during pregnancy. It occurs when a woman's blood hemoglobin level is lower than the reference value for her age and gender. The WHO defines anemia in pregnancy as a blood concentration of <11 grams per deciliter (g/dl) in a woman with a normal blood sugar level of 10.9 grams per cent, 7 grams per cent, or <7 grams per cent (mild, moderate, or severe anemia).[1] Anemia is estimated to affect 9% of people in developed countries, while 43% of people in developing countries have anemia. The

worldwide anemia prevalence is assessed to be 47% for children less than 5 years of age, 42% for pregnant women, and 30% for non-pregnant women between 15 and 49 years of age. Asian and African people account for over 85% of absolute anemia burdens in high-risk groups. Anemia affects 25 million people worldwide, 56 million of whom are pregnant women.[2, 3]

One of the main causes of illness and death among pregnant mothers in underdeveloped countries is pregnancy-related anemia, which has detrimental consequences on both the mother and the fetus. Globally, anemia is estimated to be the cause of around 115,000

maternal and 591,000 perinatal deaths per year.[4] Asia has the most anemia cases in the globe The Indian subcontinent is home to about half of the world's anemic women, and 88% of them experience anemia during pregnancy. The primary cause of this high rate in developing nations is malnutrition, which has also increased maternal mortality. Inadequate consumption of protein, iron, vitamin B12, folic acid, and numerous other minerals and vitamins essential for the production of hemoglobin can result in nutritional anemia.[5]

Approximately 75% of anemias diagnosed during pregnancy are caused by iron deficiency. Significant iron deficiency is correlated with characteristic hypochromic, microcytic erythrocytes on a peripheral blood smear. Other factors that may contribute to hypochromic anemia include hemoglobinopathies, inflammatory processes, chemical toxicity, and cancer, even though they are rare.[6] The prevalence of anemia has frequently been used as a stand-in for iron deficiency anemia (IDA) in sub-Saharan Africa, where iron deficiency is common. Anemia during pregnancy has also been linked to deficiencies in other micronutrients, such as riboflavin, folic acid, and vitamins A and B12. Similarly, a high occurrence of anemia has been linked to infectious diseases like HIV, helminth infestations, and malaria in sub-Saharan Africa.[7] Every stage of life is impacted, adhering to the life cycle approach. It slows down the fetus's physical growth inside the mother's womb and may result in mental growth retardation; during childhood.[8]

A mother with low iron stores and a reasonable to severe risk of anemia with pregnancy and labor are the only effects of mild anemia. Further gestations. Increased weakness, lethargy, exhaustion, and subpar work performance are possible effects of moderate anemia.[9] However, poor outcomes are linked to severe anemia. Palpitations, tachycardia, dyspnea, and elevated cardiac output may be experienced by the woman. These symptoms can escalate cardiac stress and result in decompensation and potentially fatal heart failure. Anemia has also been linked to higher rates of sepsis, pre-eclampsia (31.2%), and preterm labor (28.2%).[10] Pregnancy anemia may present with no symptoms at all and be identified through routine screening. The most typical symptom is fatigue, but other signs and symptoms are frequently nonspecific.[11] Chest pain and fainting are symptoms of severe anemia, along with weakness, palpitations, low blood pressure, shortness of breath, hair loss, dyspnea, pallor, dizziness, and lightheadedness.[5] This study aimed was to determine the frequency of anemia among pregnant women in tertiary care hospitals in Islamabad.

MATERIAL AND METHODS

This cross-sectional observational study was conducted to assess the frequency of anemia in pregnant females. The research was conducted from 6th January 2021 to 5th December 2021 at the Dr. Akbar Niazi Teaching Hospital in Islamabad, at the Department of Gynecology and Department of Pathology. All pregnant women who attended the antenatal care at ANTH were included in the study. The study excluded women who were pregnant and had a history of chronic illnesses, as well as those who did not provide consent. The World Health Organization (WHO) defines anemia in pregnancy as having a hemoglobin concentration of less than 11 g/dl. The World Health Organization (WHO) defines mild anemia in pregnancy as hemoglobin concentrations between 10 and 10.9 g/dl. The WHO defines moderate anemia during pregnancy as a concentration of hemoglobin between 7 and 9.9g/dl. Pregnant women with severe anemia have a hemoglobin concentration below 7g/dl, as defined by the WHO.

Ethical clearance of the study was approved by the Institutional Review Board (IRB) of Islamabad Medical and Dental College (IMDC) (IRB letter No. 51/IMDC/IRB-2021) before the study conductance. Confidentiality of the patients and information was maintained throughout the study.

A total of 93 patients were involved in this study. Clinical data were together from the patient's hospital records files and ward records through a structured questionnaire that included demographics and lab findings. Laboratory diagnosis of anemia during pregnancy includes a hematological test, and a peripheral blood smear was also obtained. Hematological tests involved WBC count, RBC count, RDW-CV, hemoglobin level, hematocrit, MCH, MCV, MCHC, and platelets count. Hematological parameters were analyzed to find the frequency and type of anemia in the study population. Samples from 93 pregnant females were collected. 3-4 ml of venous blood was drawn by international guidelines. 2.0 ml of blood was transferred into an EDTA vacutainers tube (BD, USA) for complete blood count and these tests were performed on state-of-the-art Mindray BC-5000 5 parts Hematological Analyzer from Shenzhen Minday Biomedicals (M-52DIFFLYSE (Cat No. 2021092401)), M-52LHLYS (Cat No. 202109300)) China.

The obtained data were analyzed by the statistical software SPSS version 21. The results were presented in number, percentage (%), and mean ± standard deviation. Descriptive statistics was applied to qualitative variables such as frequencies and percentages. Pearson correlation was applied to investigate the association of hemoglobin with obstetrical characteristics. The results were presented in the form of pie and bar charts.

RESULTS

The average hemoglobin in our study population was 11 g/dL ± 1.4 (8-13), the mean range of WBC counts was 11304 /mm3 ±7722 (4100-81000), the mean value of RBCs count was 4.1 mil/mm3 ± 0.6 (2-5), the mean value of RDW-CV was15.5 % ±3.8 (11-30), the mean value of hematocrit was 33.5 g/dL ± 4.0 (24-42), the

mean value of MCH was 27.6 % ± 5.5 (19-64), the mean value of MCV was 81.1 pg ±9.6 (60-115), the mean value of MCHC was 33.1 fl ± 1.7 (24-36), and the mean value of platelets was 230978 g/dL ±63173 (70000-462000). Red cell indices provide information about the hemoglobin content and the size of red cells. Red blood cell indices help differentiate the cause of anemia. In this study, it was found that hemoglobin was slightly reduced than normal and MCV, MCH, and MCHC were in normal ranges in the majority of cases (Table 1).

Table 1. Hematological parameters of pregnant females (n=93).

Parameters (Units)	Mean ±SD (Range)
WBC count(mm3)	11304 ±7722 (4100-81000)
RBC count (Mil/mm3)	4.1 ± 0.6(2-5)
RDW-CV(%)	15.5 ± 3.8 (11-30)
Hemoglobin(g/dL)	11.1± 1.4 (8-13)
Hematocrit (%)	33.5± 4.0 (24-42)
MCH (pg)	27.6 ± 5.5 (19-64)
MCV (fl)	81.1 ± 9.6 (60-115)
MCHC(g/dL)	33.1 ± 1.7 (24-36)
Platelets(mm3)	230978 ± 63173(70000-462000)

The occurrence of anemia in pregnant females was 45 % (n=42). Out of 42 anemic pregnant women, 25 (59.5%) had normocytic normochromic type of anemia, 15 (35.8%) had microcytic type of anemia, and 2 (4.7%) had macrocytic type of anemia. Thus, the most frequent type of anemia was normocytic normochromic type (Table 2.).

Table 2: Frequency of different morphological types of anemia in Pregnant Females (n=42).

Type of anemia	No (%)
Microcytic anemia	15 (36)
Normocytic anemia	25 (59)
Macrocytic anemia	2 (5)

Our studies showed that out of the 93 pregnant women, 42 (45%) were anemic and 51 (54.8%) were non-anemic. Among anemic pregnant females, 26 (30%) had mild anemia, 16 (17%) had moderate anemia. It was concluded that mild anemia 26 (30%) was more prevalent among pregnant females (Table 3).

Table 3: Frequency of anemia according to severity (n=42).

Severity of anemia	No (%)
Mild anemia (Hb 9-10.9)	26 (30)
Moderate anemia (Hb 7-8.9)	16 (17)
Severe anemia (Hb < 7)	0

Age, gravidity, and parity showed a non-significant correlation with hemoglobin (Table 4).

Table 4: Correlation of Obstetrical Characteristics with hemoglobin (n=42).

Parameters	Mean±SD	Correlation of Hemoglobin	
		r- value	p- value
Age	30.6±5.79	-0.072	0.778
Gravidity	3.69±2.22	-0.087	0.585
Parity	2.02±1.906	-0.123	0.440

p- value is the significane.p value <0.05 is significant. r-value is the Pearson correlation

DISCUSSION

Pregnancy-related anemia is a prevalent issue and a foremost cause of illness and death in the developed world. It significantly affects both the mother's and the fetus's health. To find out how often anemia occurs during pregnancy, 93 pregnant women from Dr. Akbar Niazi Teaching Hospital participated in this study. The pregnant women were thirty years old on average. Anemia during pregnancy was present in 45% of cases overall (n=93). Based on the blood samples of ninety-three pregnant women, the present study found that 45% percent of the women were anemic and 55 percent were not. Our results are similar to those obtained in Sana'a, Yemen, where forty percent of pregnant females visit the maternal outpatient of the hospitals.[12] This prevalence matched the findings of the global study (41.8% and 38%) that the WHO released in 2008.[13, 14] Our study's prevalence of anemia was greater than that of a study carried out in China between January 2012 and October 2017 to investigate the epidemiological characteristics and occurrence of anemia through pregnancy in that country, where the total occurrence of anemia during pregnancy was 19.9%.[15] Our study's anemia prevalence was lower than that of the Aymiba Health Center, where anemia prevalence during pregnancy was 52% overall between January and March 2015, when the work was conducted to evaluate the occurrence of anemia and its related factors among pregnant females.[4] The study conducted in Eastern Ethiopia to examine the occurrence of anemia and related issues among pregnant women revealed that 56.8% of the women had anemia, 1.2% had severe anemia, 26.7% had moderate anemia, and 28.9% had mild anemia.[4] In contrast, our work found that the

occurrence of mild anemia was 26 (30%), and the occurrence of moderate anemia was 16 (17%). However, there was no evidence of severe anemia.[5] The common age of the pregnant females in this study was 30.6 ± 6.0 years. According to a study conducted in Faisalabad, the common age of pregnant females was 26.07±5.04 years.[16] The current findings also bear a strong resemblance to those of the study carried out in an underdeveloped region in Punjab's southern region. The average age of expectant mothers was found to be 28.28 ± 5.20 years.[17] In a different study, the occurrence and contributing issues of anemia were evaluated in Mekelle Town using a facility-based quantitative cross-sectional study. That stated that the hemoglobin concentration's mean ± SD was 11.7 g/dl ± 2.32, which is comparable to our results of 11.1± 1.4 g/dl.[18]

A study carried out in South Africa revealed that 68.9% of pregnant women had normocytic normochromic anemia, whereas in our study, 25 patients (or 59% of the total) had normocytic normochromic anemia. Since all of the patients in our study were booked patients and already receiving iron therapy, normocytic normochromic anemia was found frequents morphological type of anemia.[19] In Uganda, 89 out of 345 participants in a cross-sectional study on pregnant women had Hb levels suggestive of anemia, meaning that the prevalence was 25.8%. Of them, 26 (51.7%) had moderate anemia, 18 (20.2%) had severe anemia, and 25 (28.1%) had mild anemia.[18] The mean age of pregnant women in a different community-based prospective study was found to be 24.67 ± 3.31 years among pregnant women in rural areas. Eighty-two percent of pregnant females had anemia. Of the women, 18% had normal Hb status, 45% had moderate anemia, 2% had severe anemia, and 35% had mild anemia.[4] A prospective investigation to evaluate the frequency and associated factors of maternal anemia Anemia prevalence was reported to be 16.6%. The majority of cases (64%) and 76% were morphologically normocytic normochromic (mild type).[20]

Our work used a small minor size and was led at ANTH hospital. Multicenter research is therefore required to produce results that are representative of the entire country. Additionally, research is desperately needed to identify the precise causes of anemia in expectant mothers, particularly in developing nations. Today, more than ever, it is important to raise public awareness of health issues, particularly for expectant mothers, by introducing vitamin and health promotion programs.

CONCLUSION

Anemia was found in the majority of pregnant females visiting tertiary care teaching hospitals. The frequency of mild anemia was high and also according to severity. The most common morphological type of anemia was normocytic normochromic. The overall prevalence of anemia in pregnancy was 45% (n=42).55% of pregnant women were non-anemic and new severe anemia was detected. Prenatal anemia is a worldwide public health issue. It is significant to identify and treat anemia early in pregnancy for both the mother and fetus. By detecting patients with anemia during the pre-term period and/or postponing pregnancy until optimal HB levels are achieved, the rate of anemia can be reduced. Our research suggests that prenatal nutrition care should focus on better utilization of essential nutrients such as iron, minerals, and vitamins with high biological value, as well as the implementation of interventions modified to control the prevalence and severity of anemia in pregnant women. Regular antenatal checkups should be performed, as well as regular intake of iron, folic acid tablets, and dewormers in reproductive age groups. Multiparity and late pregnancy should be addressed to reduce the risk of anemia.

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