

Frequency of Anemia and Associated Risk Factors Among Pregnant Women; A Study From The Remote Outskirts of Quetta, Balochistan

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Abstract

Objective: To determine the frequency and factors associated with anemia among pregnant women attending a rural health facility in Balochistan.

Methodology: This descriptive cross sectional study was carried out at the Mufti Mehmood Memorial Hospital, Quetta, Balochistan from July 2018 to July 2019. All pregnant women who attended the antenatal clinic during the study period were prospectively included. Exclusion criteria included patients who didn't consent to participate and those with a history of inherent bleeding disorders (i.e., thalassemia, sickle cell disease), and diseases of kidney and liver or other chronic illnesses. The anemia was managed according to standard protocols.

Results: During the study period, 271 pregnant women attended the healthcare facility. Their ages ranged between 13-41 years with a mean age of 26.36 ± 7.66 years. The hemoglobin of 146(53.87%) women was within normal limits, whereas 125 (46.12%) had anemia. The anemia was mild, moderate, and severe in 71(56.8%) women, 39 (31.2%) women, and 15 (12%) women, respectively. Iron deficiency anemia (n=112; 89.6%) was the commonest type of anemia. The frequency of anemia was highest among women in their third trimester of pregnancy. Out the 125 anemic women, 17(13.6%) were nulliparous, 63(50.40%) women were multipara and 45 (36%) grand multipara.

Conclusion: A significant proportion of the pregnant women had anemia. Multiparous women in their third trimester were the more frequently sufferers. The underlying risk factors associated with anemia included poverty related underconsumption of iron supplements and iron-containing foods such as eggs, meat, vegetables, fruits, and fish. The public health issue can be addressed with dietary interventions for the poor population.

Key words: Iron deficiency anemia, Folate deficiency anemia, Pregnancy anemia, Antenatal clinic, Iron-containing foods, Iron supplementation.

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Introduction

Anemia in pregnant women is a recognized public health issue, affecting at least 20% of the women worldwide. The World Health Organization (WHO) has defined the cut off value for pregnancy anemia as the hemoglobin (Hb) concentration of <11 g/dL. The Centre for Disease Control (CDC) has defined the cut off values trimester wise as well as for the postnatal period. i.e., <11 g/dL in first and third trimester, <10.5 g/dL in second trimester and <10 g/dL in postnatal period.¹⁻³

Anemia in pregnancy carries significant repercussions both for the mother as well as the fetus. This can cause a variety of maternal and perinatal adverse outcomes. For instance, preterm labor, low birth weight and intrauterine growth restriction (IUGR) and placental abruption. It is also a significant risk factor for maternal

morbidity and mortality. With severe anemia the mother is likely to have issues such as palpitations, dyspnea, cardiac decompensation and cardiac failure. In Asia, anemia constitutes the second leading cause of maternal death, contributing to significant percentage of deaths due to postpartum hemorrhage.^{1, 4, 5}

Internationally, there is growing awareness about the significant fetomaternal consequences of anemia in pregnancy. However, there is dearth of quality research into this issue in our remote areas. The current study was therefore planned to determine the frequency and underlying risk factors of anemia among pregnant women in a rural health centre in Balochistan. The study will thus furnish valuable evidence in this regard and help to provide underpinning for future remedial

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measures to better address this health issue in larger perspective.

Methodology

This descriptive cross sectional study was conducted at the Mufti Mehmood Memorial Hospital, Quetta, Balochistan from July 2018 to July 2019. All pregnant women who attended the antenatal clinic during the study period were prospectively included. Exclusion criteria included patients who didn't consent to participate and those with history of inherent bleeding disorders (i.e., thalassemia, sickle cell disease), and kidney, liver or other chronic diseases. Non-probability consecutive sampling was employed. Informed consent was obtained from all of the women who participated in the study. Being an observational study, it was performed in conformity to the Helsinki's declaration of 1975, as revised in 2008. Anonymity of the patients was guaranteed.

Proforma was employed to collect data regarding the various variables of interest. The collected data included the age of the woman, gravidity/parity, trimester of pregnancy, and Hb levels in the first, second and third trimesters. Also, history was sought regarding any polymenorrhea or menorrhagia prior to the index pregnancy, regularity of iron supplementation, and intake of iron-containing foods (i.e. eggs, meat, fish, vegetables/ fruits) during pregnancy.

The full blood count, red cell indices, and RBC's morphology were carried out in laboratory. A haemoglobin level of <11 g/dL was considered anemia. WHO criteria for mild, moderate, and severe anemia were haemoglobin levels of >10-10.9 g/dL, ≥7-10 g/dL and <7 g/dL respectively. A serum ferritin concentration of <30 µg/L along with a Hb level of <11 g/dL during the 1st trimester, <10.5 g/dL during the 2nd trimester, and <11 g/dL during the 3rd trimester were employed as diagnostic criteria for iron deficiency anemia.^{3,6}

The anemia was managed according to standard protocols. All the data were recorded on proforma and subjected to statistical analysis to measure the objectives.

The data were analysed through SPSS for Windows version 22.0 (IBM SPSS, Chicago, IL, USA). The continuous variables were presented as mean and standard deviation. i.e., age and Hb level etc. All categorical values were presented as frequency and proportions. The percentages of various variables were compared by employing chi-square test and *p*-value of less than 0.05 was regarded statistically significant.

Results

During the study period, 271 pregnant women attended the healthcare facility. Their ages ranged between 13-41 years with a mean age of 26.36±7.66 years.

The hemoglobin of 146(53.87%) women was within normal limits whereas 125 women (46.12%) had anemia. The anemia was mild, moderate and severe in 71(56.8%) women, 39 (31.2%) women and 15 (12%) women, respectively. (Figure 1)

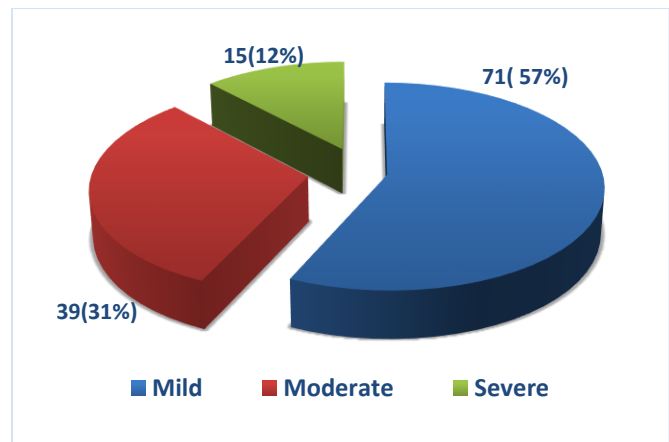


Figure 1. Distribution of anemia cases with respect to the intensity of anemia. (n=125)

Iron deficiency anemia (n=112; 89.6%) was the commonest, followed by folate deficiency 5(4%), combined iron and folate deficiency 8(6.4%).

The frequency of anemia was highest among women in their third trimester of pregnancy. The trimester-wise comparative frequencies amongst anemic versus non-anemic women are summarized in Table I.

Out the 125 anemic women, 17(13.6%) were nulliparous, 63(50.40%) women were multipara and 45 (36%) grand multipara.

Trimester	Anemia Present (n=125) N (%)		Anemia Absent (n=146) N(%)		Total Women (n=271) N(%)		P-value
First	25	40.32%	37	59.67%	62	100	<0.001*
Second	34	39.08%	53	60.91%	87	100	
Third	66	54.09%	56	45.90%	122	100	

Table II: Distribution of the anemia cases with respect to various dietary risk factors. (n=125)

Risk factors	Present N(%)		Absent N(%)		P-value
Regular use of eggs in diet	28	22.4%	97	77.6%	<0.001*
Regular use of meat in diet	17	13.6%	108	86.4%	<0.001*
Regular use of fish in diet	0	0	125	100%	<0.001*
Regular use of vegetable/ fruits	31	24.8%	94	75.2%	<0.001*
Regular use of Iron supplements	13	10.4%	112	89.6%	<0.001*

Various dietary risk factors associated with anemia included lack of consumption of eggs (n=97; 77.6%), meat (n=108; 86.4%), fish (n=125; 100%) or vegetables (n=94; 75.2%), and lack of supplemental iron intake (n=112; 89.6%) during pregnancy. (Table II)

Discussion

In this study, the frequency of anemia was found to be 46%. Different local studies from Pakistan have reported variable frequencies of pregnancy anemia, ranging up to 75.2%. The WHO country estimates for pregnant Pakistani women reported 50% women with Hb level <11.0 g/dL and 2.1% women with Hb levels <7.0 g/dL.^{7,8} The observed frequency of pregnancy anemia in our study is higher than that reported from several developed countries. For instance, the frequency was 22% in the USA⁹ whereas 31% in Belgium.¹⁰ Even higher frequencies have been reported from developing countries such as India (84.9%)¹¹ and rural Bangladesh (50%).¹²

In this study iron deficiency was the commonest cause of anemia, found among 90% of the anemic women. Our finding conforms to several studies where iron deficiency has been reported to be the most common nutritional deficiency and cause of anemia during pregnancy. The problem of iron deficiency may stem from a variety of factors. For instance, dietary deficiency and poor iron absorption due to diets high in phytates or inflammatory bowel disease. Additionally, there is increased iron demand during pregnancy, gynecological diseases associated with heavy blood loss, low iron body stores before pregnancy, worm infestations, infections, or following blood donation.¹³

Pregnancy anemia can arise due to factors other than insufficient iron levels. These factors contain parasitic infestations, such as malaria, hookworm infections, and schistosomiasis, as well as deficiencies in essential micronutrients like folic acid, vitamin A, and vitamin B12. Additionally, genetically inherited conditions like thalassemia, sickle cell disease, and glucose-6-phosphate dehydrogenase (G-6-PD) deficiency can contribute to anemia. Anemia can also be caused by

bone marrow diseases that inhibit the production of red blood cells, chronic renal failure, rheumatoid arthritis, and tuberculosis. HELLP syndrome is a condition characterized by hemolysis, elevated liver enzymes, and low platelet count, which can occur during the late stages of pregnancy or after childbirth. Pregnancy-induced hypertension (PIH) may be an underlying factor in the development of this syndrome.¹⁴

In this study the highest frequency of pregnancy anemia was found among women in their third trimester of pregnancy. Several published studies have reported higher frequency of anemia in the second and third trimester of pregnancy. With advancing gestational age, there is a concomitant increase in plasma volume and hence anemia may manifest more clearly.^{15, 16}

In this study the frequency of pregnancy anemia was higher among multiparous than nulliparous women. The majority of the anemic women were having frequent pregnancies at small intervals. Published studies have reported frequent anemia among women with previous 2-4 living issues. With repeated pregnancies, the body stores of iron are depleted. Our finding conforms to several published studies.¹⁷⁻¹⁹

Full blood count, red cell indices and RBC's morphology constitute the first line tests for investigating anemia in pregnancy. The cut off values of Hb are checked. These should be advised at the booking visit as well as at 28 weeks.^{20, 21}

As iron deficiency is very common among our population. All child bearing age, and especially pregnant women, should be motivated to ensure intake of iron rich foods. For instance, eggs, red meat, fish, and vegetables. They should avoid concomitant use of foods that inhibit the absorption of iron from gut. The antenatal care programmes should include interventions to address the issue in a national perspective. These include fortification and dietary diversification for the poor populations. Awareness on the part of the healthcare team is also imperative. They should be cognizant that, in addition to improved diet, use of supplemental iron is mandatory to treat established iron deficiency. The ferrous salts of iron, such as ferrous

sulphate, ferrous fumarate, and ferrous gluconate are the preparations of choice. The oral dose for iron deficiency anemia should be 40-80mg of elemental iron daily. Intravenous iron is indicated for addressing severe iron deficiency anemia from the second trimester onwards or among women who fail to respond to or are intolerant of oral iron. Blood transfusion if Hb <70g/l.^{22, 23}

Emphasizing the Importance of Antenatal Care: Regular antenatal care visits play a vital role in the detection and management of anemia during pregnancy. Monitoring full blood count, red cell indices, and red blood cell morphology are essential components of antenatal care and can help in the early identification and appropriate management of anemia.²⁴

Conclusion

Significant proportion of the pregnant women had anemia. Multiparous women in their third trimester were the more frequently sufferers. The underlying risk factors associated with anemia included poverty related under consumption of iron supplements and iron-containing foods such as eggs, meat, vegetables, fruits, and fish. The public health issue can be addressed with dietary interventions for the poor population.

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