ORIGINAL ARTICLE

Prevalence of Anemia in Pregnant Women Attending a Healthcare Facility in Multan: A Cross-Sectional Study

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ABSTRACT

Objective: To assess the prevalence of anemia among pregnant women attending a healthcare facility in Multan and identify its associated sociodemographic determinants.

Study Design: A cross-sectional study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynecology and Department of Medicine, Bakhtawar Amin Trust Hospital Multan, Pakistan, from January 2021 to January 2022.

Methods: The study included 250 pregnant women selected by consecutive sampling. The sample size was calculated by keeping the estimated incidence of anemia at 40%, 5% margin of error and a 95% confidence interval. The data was collected through a structured questionnaire, which included questions about demographic data (age, educational status, occupation, and eating habits) and the obstetric history of women. Complete blood picture of all the participants was recorded. Women with hemoglobin levels < 11 g/dL were considered anemic. SPSS version 23 was used for data analysis. Binary logistic regression analysis was used to determine the association between factors. P-value <0.05 was considered statistically significant.

Results: Of 250, 112 (45%) had anemia. Anemia had a higher prevalence in women aged 36 to 40 years. Regarding risk factors, women in the first trimester had a significantly higher risk of anemia than those in the second or third trimester (P <.0001). Moreover, women who had > 4 pregnancies had a higher risk of anemia (P<.0001). Nutrition counseling and healthy dietary habits significantly decreased the risk of anemia (P< .0001).

Conclusion: Anemia is a significant health concern in pregnant women, with the highest prevalence during the first trimester. Low socioeconomic background, poor dietary habits, and more than four pregnancies are significantly associated with the development of anemia during pregnancy.

Keywords: *Anemia, Pregnancy, Obstetrics, Women.*

Introduction

Anemia is a primary global health concern affecting all age groups.[1] It is prevalent among developed and developing nations and has adverse effects on human health and socio-economic progress. Although it can appear at any stage of life, it is more prevalent in pregnancy and young children.[2] Anemia has many causes, but the most significant is iron deficiency, which contributes about 50% to the burden of anemia in different population groups and regions.[1]

Anemia is a common health concern, and women of reproductive age are particularly at risk. Studies conducted earlier showed that the anemia affects 40 % of pregnant women and

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20% of non-pregnant women.[3] It has high prevalence in Africa (46.3%) and South East Asia (48.7 %).[4] According to a WHO report published in 2015, worldwide 38% of pregnant women are anemic, with 18% in developed countries and 35 to 75% in developing countries.[5,6] It can have devastating health concerns for both mother and fetus and have high maternal mortality. Maternal anemia is associated with pre-eclampsia, eclampsia, shock, stillbirth, intensive care unit (ICU) admission and post-partum hemorrhage, fetal malformations, intrauterine growth restriction(IUGR), and low birth weight.[6,7] Studies showed an association of anemia in pregnancy with reduced intake of iron supplements and meat, intake of dirt or clay, blood loss, chronic disease, parasites, multiple pregnancies, alcohol, smoking, and folic acid deficiencies.[8,9]

The worldwide data shows the prevalence of anemia among third-world countries, and Pakistan is one of the countries with a high anemic population, with up to 77% of pregnant women affected by this condition.[10] Since prenatal awareness is limited and women do not pay much attention to frequent check-ins with the OBGYN to monitor their health, anemia can be fatal to maternal health. The study's objective was to determine the frequency of anemia in pregnant women and its associated factors. This will help us in reducing the factors that cause anemia and reinforcing practices that will help to prevent the development of anemia during pregnancy.

Methods

The cross-sectional study was conducted at the Department of Medicine, Obstetrics and Gynecology, Bakhtawar Amin Trust Hospital Multan, Pakistan, from January 2021 to January 2022 after taking ethical approval from the Ethical Review Board of the hospital held on date: 8th February 2021 vide letter no: 24/120. The inclusion criteria of the study were 250 pregnant women selected by consecutive

sampling. The sample size was calculated by keeping the estimated incidence of anemia 40%, 5% margin of error and 95% confidence interval. Females who had anemia due to other causes, such as sickle cell anemia, thalassemia, hemolytic anemia, autoimmune disease, and chronic kidney disease, were excluded. Informed consent was taken from study participants.

The data was collected through a structured questionnaire, which included questions about demographic data (age, educational status, occupation, and socio-economic status) and obstetric history of women (gestational age, parity, eating habits). Women were also asked about basic wellbeing, such as sleep duration and exercise schedule. Complete blood picture of all the participants was recorded. Women with hemoglobin levels < 11 g/dL were considered anemic.

SPSS version 23 was used for data analysis. Categorical data was presented as frequency and percentages and was compared using a t-test. Binary logistic regression analysis was used to determine the association between factors and was presented by odds ratio and 95% confidence interval. P-value <0.05 was considered statistically significant.

Results

A total of 250 pregnant women were included in the study. Of 250, 112 (45%) had anemia. The mean age of the participants was 30.4 years. Among study participants, 212 (85%) were urban residents, and 108 (43.2%) belonged to a middle social background. (Table-1). Anemia had a higher prevalence in women aged 36 to 40 years. Employed women had a higher prevalence of anemia compared to housewives (46.8% vs. 45%). Moreover, patients from a low socioeconomic background had higher prevalence of anemia. (Table-1 and 2).

Regarding risk factors, women in the first trimester (53.5%) had a significantly higher risk of anemia than those in the second (25%) or

Table-1: Socio-demographic characteristics and prevalence of anemia in study population

Variable	Anemic (n=112) n (%)	P-value	t Statistics
Age			
20-25	30 (26.8)		
26-30	28 (25)		
31–35	25 (22.3)		
36–40	22 (19.6)		
Above 40 years	10 (8.9)		
Residence			
Urban residence	95 (84.8)		
Socio economic status			
Low (< Rs20,000 per month)	64 (57.1)		
Middle (Rs 50,000-100,000 per month)	45 (40.1)	< 0.0001	141.416
High (> Rs 100,000 per month)	3 (2.7)	< 0.0001	
Educational status			
Primary school	7 (6.2)		
Matriculation	22 (19.6)	0.27	1.133
Higher secondary qualification	30 (26.8)	0.5	0.683
Bachelor's degree	44 (39.2)	0.5	0.680
Postgraduate education	9 (8.8)	0.8	0.262
Occupation			
Unemployed	57 (50.8%)	0.8	0.255
Employed	55 (49.1%)		

Table-2: Socio-demographic characteristics and prevalence of non-anemia in the study population

Variable	Non-anemic (n=138) n (%)	P-value	t Statistics
Age			
20-25	35 (25.3)		
26-30	50 (36.2)	0.15	1.462
31–35	34 (24.6)	0.75	0.321
36–40	12 (8.7)	0.09	1.859
Above 40 years	7 (5)		
Residence			
Urban residence	120 (86.6)		
Socio economic status			
Low (< Rs20,000 per month)	0 (0)		
Middle (Rs 50,000-100,000 per month)	62 (44.9)	< 0.0001	4.304
High (> Rs 100,000 per month)	76 (55.1)	< 0.0001	

Educational status			
Primary school	13 (9.4)		
Matriculation	22 (15.9)	0.27	1.133
Higher secondary qualification	36 (26)	0.5	0.682
Bachelor's degree	53 (38.4)	0.5	0.679
Postgraduate education	14 (10.1)	0.8	0.259
Occupation			
Unemployed	65 (47.1)	0.8	0.254
Employed	73 (52.8)		

third trimester (21.4%) (*P*<.0001). Moreover, women who had > 4 pregnancies had a higher risk of anemia (*P*< .0001). Nutrition counseling and healthy dietary habits significantly decreased the risk of anemia (*P*< .0001). The majority of women did not have any nutritional counseling during pregnancy. (Table-3).

Discussion

Anemia during pregnancy is a major health concern in developing countries. In the current study, we assessed the prevalence of anemia in pregnant women and its associated factors. Studies show that iron deficiency anemia is a major problem in many regions.[11] The results indicated 45% of pregnant females had anemia. This is higher than prevalence of 31.8%, and lower than 59.8%, as reported by Saudi Arabian and Tanzanian study. This difference may be because of different geographical characteristics, variable eating habits, and different sampling tech-niques.[12,13] In current study, women from low socio-economic background had higher risk of developing anemia. This can be due to lower accessibility to a healthy diet. An Indonesian study suggested that low income groups should be prioritized in initiatives for anemia during pregnancy.[14] In current study there was no association between educational status and anemia. Women who had knowledge of anemia did not make any lifestyle or dietary modification on the basis of their knowledge. This shows the need of awareness programs to educate women about anemia during pregnancy. The results of our study are in contrast to a previous study, which showed that women with high educational status had better heath-related choices and low incidence of anemia.[15] Similarly, our results showed no association between educational status and anemia, but several studies report low education status as a risk factor for anemia in pregnant women.[16,17]

In the current study, women in the 2nd and 3rd trimesters are at lower risk of anemia compared to those in the 1st trimester. This can be explained by the hypothesis that during the 2nd trimester, women are more aware of behavioral changes for preventing anemia.[18] Inadequate knowledge about prenatal care during early pregnancy can contribute to low iron intake. On the other hand, during late pregnancy, women are more conscious of their dietary intake. These results are consistent with Abd Rehman et al.'s, which indicated that early pregnancy has a significant association with the risk of developing anemia.[19]

A significant association was found between a higher number of previous pregnancies and the risk of anemia. Around 26.8% of women in the anemic group in our study had their fourth pregnancy compared to 16.1% and 17.8% in their first and second pregnancy, respectively. A Taiwanese study reported that multiparty causes lowered iron levels, which increases the risk of anemia. This is complicated by prolonged lactation and closely spaced pregnancies.[20] Lack of a healthy diet during pregnancy increases the risk of anemia. Moreover, women who received diet counseling during pregnancy were more likely to avoid anemia compared to others. This was confirmed by the finding that women who received diet counseling during pregnancy were more likely to avoid anemia compared to others.

Table-3: Factors associated with anemia during pregnancy based on obstetric and medical history

Variables	Anemia (n=112) n (%)	Non anemia (n=138) n (%)	OR (95%CI)	P-value
BMI				
Low (<18.5 kg/m2)	13 (11.6)	9 (6.5)		
Normal (18.5-25 kg/m2)	87 (77.6)	112 (81.1)	0.550 (0.31–1.30)	0.14
High (>25 kg/m2)	12 (10.7)	17 (12.3)	0.60 (0.199–1.60)	0.28
Gestational age				
1st trimester	60 (53.5)	18 (13)		
2nd trimester	28 (25)	56 (40.5)	0.20 (0.10-0.30)	<0.0001
3rd trimester	24 (21.4)	64 (46.3)	0.09 (0.09-0.18)	<0.0001
Number of pregnancies				
1st	18 (16.1)	35 (25.3)		
2nd	20 (17.8)	46 (33.3)	0.90 (0.6–1.70)	0.69
3rd	19 (17)	41 (29.7)	0.96 (0.50-1.88)	1.0000
4th	30 (26.8)	10 (7.2)	5.40 (2.40–11.30)	<0.0001
≥5th	25 (22.3)	6 (4.3)	8.0 (2.99–22)	<0.0001
Daily exercise				
0	105 (93.7)	122 (88.4)		
30–60 minutes	6 (6.2)	15 (10.9)	0.7 (0.30–1.40)	0.04
More than 1 hour	0 (0)	1 (0.7)	0.30 (0.04–7)	0.40
Sleep duration				
3 h≥	0 (0)	5 (3.6)		
4–7 h	85 (75.9)	98 (71)	9.19 (0.7-170)	0.15
≥8h	27 (24.1)	35 (25.4)	7.8 (0.50-153)	0.14
Breakfast				
Yes	100 (89.3)	92 (66.6)		<0.0001
No	12 (10.7)	46 (33.3)	0.30 (0.15-0.50)	
Nutrient rich diet				
Yes	59 (52.7)	128 (92.7)		<0.0001
No	53 (47.3)	10 (7.3)	12.2 (6.0-27)	
Nutritional counseling during pregnancy				
Yes	24 (21.4)	72 (52.1)		< 0.0001
No	88 (78.6)	66 (47.8)	3.70 (2.20-6.30)	

This was confirmed by the findings of a study done in rural India by Subramanian M et al.[21]

The literature regarding anemia in pregnant women also report contradictory results than our study. Our study reported that women in their 2nd and 3rd trimesters are less likely to be anemic; however, Eweis et al. and Bedi et al. reported anemia to be a high-risk condition in women in the 3rd trimester.[22,23] In our study, anemic women were aged between 36-40 years. Still, younger pregnancies have been reported to have caused anemia more frequently than in

middle-aged women, which may be due to the fact that older women in our country have high parity.[24]

An awareness program and further research studies that investigate various aspects of pregnancies should be organized to prevent the risk of anemia in all-aged pregnant women. The main focus should be on the identified groups in our study: women pregnant with their fourth child in their first trimester and those belonging to lower classes with limited resources. Routine checkups and awareness sessions should be organized to ensure compliance with dietary requirements.

The limitation of this study is the small sample size. Because of the small sample size, a multi-centered research is recommended for further analysis.

Conclusion

There is a high frequency of anemia in pregnant women in Pakistan, especially during the first trimester. Low socioeconomic background, poor dietary habits and high parity are significant risk factors of this incidence. Awareness programs for nutritional counseling and birth spacing can be helpful to mitigate the risk.

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Authors Contribution

IH: Idea conception, data collection

TR: Study designing, manuscript writing and proofreading

AG: Data collection, data analysis, results and interpretation

SM: Idea conception

MT: Data collection, manuscript writing and proofreading

HNS: Data collection

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