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Original Article

Frequency and causes of iron deficiency anemia in patients visiting gynae outdoor unit: an institutional based study

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Abstract
Present study was conducted in order to determine the prevalence of anemia among pregnant women attending Government Mian Munshi Teaching Hospital, Lahore. For this, one hundred pregnant females were selected randomly; relevant data was collected by interviewing and filling a questionnaire especially designed to record various socio-demographic characters of patients and their dietary history. Prevalence rate of anemia in the present study was found to be 78% (9.57±1.07), between age 19-40 years and it's higher in 3rd trimester of their pregnancies. Additionally low educational status and poor dietary habits showed high risks of anemia among the pregnant women.
Key Words: iron deficiency anemia; pregnant women; hemoglobin; Lahore

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INTRODUCTION

Iron deficiency is a major/main cause of anemia during pregnancy. Anemia usually affects all age groups but it is commonly prevalent among pregnant females. Anemia during pregnancy is a major issue in many developing and industrialized countries. Major causes of anemia are inherited genetic abnormalities/defects, dietary deficiencies, chronic diseases, blood loss (external or internal bleeding) or decrease in red blood cells (RBCs) production (UNCF, 2001). Severity of anemia usually depends upon one or multiple reasons/causes. There is an increased risk of anemia during pregnancy as need of stored iron is increased for the developing fetus (Bothwell and Charlton, 1984; Abbasi *et al*., 2013). The insufficient iron level might be adverse for maternal and fetal (ACOG, 2008). Several studies indicate close relationship/association between pregnancy and anemia (Fleming, 1984, Levin *et al*., 1993, Viteri, 1994; Gillepse, 1997). Lower normal limit for hemoglobin (Hb) in non pregnant females is taken as 11.5g/dl while women having Hb<10g/dl are considered anemic (Frewin *et al*., 1997) and if Hb<8.0 gm/dl its severe anemic (World Fact book, 2008). During a normal pregnancy, plasma volume increase continuously throughout pregnancy. Most of it occurs by 34 weeks of gestation. Plasma volume expansion is more than increase in red cells mass. As a result, there is a decrease in hemoglobin concentration, hematocrit and red cell count (Hytten, 1985). Maternal anemia causes cardiovascular stress, increased fatigue, decreased work activity, less resistance to cold and intense blood loss in pregnant women with adverse birth outcomes (Cook *et al*., 1994; WHO, 1991; Scholl, 2005; Kisioglu *et al*., 2004). Severe maternal anemia is associated with birth of small babies due to prematurity and intra uterine growth restriction (IUGR) (Steer, 2000). It also leads to poor perinatal outcome-preterm delivery, low weight births, IUGR, low American Pediatric Gross Assessment Record APGAR, intra uterine death and perinatal death (Lone *et al*., 2004;

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Karaflahin *et al*., 2007). Risk of preterm birth, low birth weight and small gestation increases progressively with decrease of first trimester hemoglobin concentration (Ren *et al*., 2007). A study showed that there is a correlation between preterm labour and anemia (Manzoor *et al*., 2015). In Pakistan, 53% of the population is women. According to a study, 90.5% of the pregnant females were found to be anemic in urban areas of Pakistan and 0.7% amongst them are severely anemic (Riffat and Ayesha, 2008). Anemia is highly common in Pakistan (Baig-Ansari *et al*., 2008). The current study was conducted to determine percentage of anemia in pregnant women of District Lahore.

MATERIAL AND METHODS

One hundred pregnant females of age group between 17-45 years and in first, second and third trimester of their pregnancies, who visited Government Mian Munshi Teaching Hospital, Lahore from August-October, 2015 were included in the present study. Blood sampling and respective data collection was done on regular basis. All the volunteer participants (pregnant women) were informed and demonstrated about the study that the information and data obtained will be used for research purpose only and kept confidential. A questionnaire/performa was designed to obtain detailed history of patients. Complete blood count (CBC) of the collected blood samples was conducted by using a CBC analyzer. Frequencies and percentages were calculated by using SPSS software, chi-square test was used to examine the significance of different variables. Correlations were considered significant if $P<0.05$.

RESULTS AND DISCUSSIONS

According to WHO standards, anemia in pregnancy is present when the hemoglobin concentrations in blood are less than 11.0 g/dl (WHO, 2000). In the present study, it was found that 78% (9.57±1.07) of the total analyzed patients (100) were anemic and 22% (11.68±0.62) were non-anemic (Table I). Different studies were being conducted to know about the prevalence/frequency of maternal anemia in different areas of Pakistan. The percentage of anemic pregnant females was reported 54.3% by Naz and Begum (2013), 60% by Nazir *et al*. (2011), 75% in district Faisalabad by Anjum *et al*. (2015).

Moreover 8% of the patients were severely anemic, 41% were moderately anemic and 29% were mildly anemic. The mean Hb value of the pregnant women was 10.03±1.32 g/dl similar to the work in Nigeria, the mean Hb value of the pregnant women was 11.62±1.21 g/dl (Busseri *et al.,* 2008). Biochemical and hematological parameters correlate during pregnancy. The hemoglobin hematocrit and red cell count decreased during pregnancy. One factor may be the expansion of plasma level. It may be due to inadequate food consumption, malabsorption, worm infestations or excessive menstrual bleedings (Jilal *et al*., 2000). In the present study red cell count was lower than normal i.e 90%. Study from Lahore, Pakistan has reported the prevalence of anemia in pregnant ladies as 66% (Sohail *et al*., 2004).

Table I: Percentage distribution of anemia

No.	Categories	No. of patient (%)	Mean±SD
1.	Anemic	78	9.57±1.07
2.	Non-Anemic	22	11.68±0.62

Total No of patients=100, P-value= <0.001

Table II: Severity of anemia amongst the anemic females

No.	Anemia status	No. of patients (%)
1.	Severe anemia (<=8.00)	8
2.	Moderate anemia (8.1-9.9)	41
3.	Mild anemia (10.0-10.9)	29
4.	Non-anemic (11.0+)	22
5.	Total	100

Complete blood count (CBC) was performed on 100 patients (Table III). Out of hundred patients WBC was high in 24 (12.16±1.04) and normal in 76 (8.12±1.52) patients; none of them was with low WBC. The RBC was low in 90 (3.78±0.50), normal in 10 (4.78±0.33) whereas there was none with high value. Mean corpuscular hemoglobin/cell (MCH) was found to be low in 4 (18.07±0.10), normal in 89 (25.84±2.83) and high in 7 (37.15±5.75) patients. In case of MCHC, it was low in 8

(29.56±0.56), normal in 82 (32.00±1.25) and high in 10 (40.67±5.38). MCV was low in 24 (67.68±8.7) patients, normal in 71 (82.65±5.05) and high in 4 (98.25±0.95). HCT was normal in only 1 (41.8±0.00), low in 99 (30.85±4.39) and high in nil. In our study, 3.8% of the anemic females were in 1st trimester (<12 weeks), 7.7% in 2nd trimester (13-24 weeks) and 88.4% in 3rd trimester (>24 weeks) (Table IV).

Table III: Complete blood count (CBC) parameters

No.	Parameters analyzed	Parameters range	Number of patients	Mean±SD
1.	WBC	Low (<4/Cu.mmx10^3)	Nil	-
		Normal (4-11/Cu.mm x10^3)	76	8.12±1.52
		High (>11/Cu.mm x10^3)	24	12.16±1.04
2.	RBC	Low (<4.5 Mill/Cu.mm)	90	3.78±0.40
		Normal (4.5-6.5Mill/Cu.mm)	10	4.78±0.33
		High (>6.5Mill/Cu.mm)	Nil	-
3.	MCH	Low ((<20Pg)	4	18.07±0.10
		Normal (20-32Pg)	89	25.84±2.83
		High (>32Pg)	7	37.15±5.75
4.	MCHC	Low (<30%)	8	29.56±0.56
		Normal (30-35%)	82	32.00±1.25
		High (>35%)	10	40.67±5.38
5.	MCV	Low (<76 fl)	24	67.68±8.71
		Normal (76-96 fl)	71	82.65±5.05
		High (>76.96 fl)	4	98.25±0.95
6.	HCT	Low (<40%)	99	30.85±4.39
		Normal (40-54%)	1	41.8±0.00
		High (>40-54%)	Nil	-

Table IV: Frequency of anemia on the basis of gestational age

No.	Gestational week	Anemic		Non-anemic	
		No. of patients	%age	No. of patients	%age
1.	1st Trimester (<12 weeks)	3	3.8%	2	9%
2.	2nd Trimester (13-24 weeks)	6	7.7%	1	5.4%
3.	3rd Trimester (>24 weeks)	69	88.4%	19	86.3%

(Chi-square= 1.19, P-value =0.55)

Recent studies reported the occurrence of anemia in Pakistan population is to be 54% in 3rd trimester, which also supports our findings (Dilshad *et al.*, 2010). Another study conducted in district Faisalabad, Pakistan, also supports our findings durin which 89.3% of the anemic females were in 3rd trimester of their pregnancies (Anjum *et al*., 2015). It was observed that there is high frequency of anemia in 3rd trimester; this may be due to the increased micronutrients demand during this period of pregnancy due to poor dietary habits (Mardones *et al*., 2003; Bakhtiar *et al*., 2007; Rizwan *et al*., 2010).

Conclusion

Present study indicated the frequency or prevalence of anemia amongst the pregnant ladies as 78%, in third trimester and more common in age group of 19-40 years. Present study clearly suggests that improvement must be done for public health facilities, health education and socio-economic status uplift.

Future Perspectives

Special attention should be paid to the pregnant females who are at higher risk of anemia. Some informative programs as well as supplementation programs should be launched to educate females especially about the pregnancy and associated problems. Additionally it is suggested that Iron and folic acid supplements help reducing rate of anemia during pregnancy. Good nutrition (iron rich diet) also decreases the occurrence of anemia.

Competing Interests

There are no competing interests.

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