Original Research Article

Gestational Anaemia and its Associated Factors in Normal Pregnant Women

Abstract

Objectives: To determine the hemoglobin levels in normal pregnant women and investigate the association of anemia with gestational age, number of antenatal visits, obstetrical complications and mode of delivery.

Methodology: This is a cross-sectional study conducted at the Lady Willingdon Hospital, Khairpur Mirs, Pakistan from May 2021 to August 2021. A total of 139 normal pregnant women were recruited during antenatal visits. Patients were grouped into normal and anemic groups based on serum hemoglobin levels. Gestational age, obstetrical complications, mode of delivery and fetal outcome were recorded to find its association with anemia. Data was analyzed on SPSS 20.0 and p-value < 0.05 was considered as statistically significant.

Results: Out of n=139 normal pregnant women, n=26 women had normal hemoglobin levels, n=49 were mild anemic, n=46 had moderate anemia whereas n=18 had severe anemia. Overall, the prevalence of gestational anemia was 81%. There was significant association between hemoglobin status and number of antenatal visits and complications in previous pregnancies. Hemoglobin status was not significantly associated with gestational age and mode of delivery.

Conclusion:

In conclusion, we found that gestational anemia is highly prevalent in Pakistan. Early detection of anemia and its correction via supplementations are recommended.

Key words: Gestational anemia, hemoglobin, pregnant women, factors

Introduction:

Gestational anaemia is a global problem, affecting half billion women in their reproductive age. According to the 2011 statistics, 38% of pregnant women suffered from anaemia worldwide and the highest prevalence was recorded in South Asia and Central and West regions of Africa [1]. Anemia during pregnancy may lead to higher maternal mortality and morbidity and obstetrical complications including miscarriage, prematurity, low birth weight and stillbirth especially in developing countries [2, 3]. In Pakistan, the prevalence of anemia among reproductive age women has been showed around 41% to 77%, with higher frequency in women from rural areas [4]. Anemia impairs the blood capacity of transporting oxygen in the body and indicates poor nutrition and health. The risk factors and the cause of gestational anaemia are iron deficiency [1] that may be due to insufficient dietary intake, malabsorption, increased requirements during pregnancy, iron losses due to menstruation. Other causes include infections, worm infestations, genetic predisposition and lower socio-economic conditions [5, 6]. According to the World Health Organization (WHO), regularly iron and folic acid supplementations are required in pregnancy to prevent anaemia [7].

The hemoglobin status and prevalence of anemia is the main indicator of public health especially in the most vulnerable group of pregnant women. This indicator also assess the impact of effective interventions carried out in reducing the anemia during pregnancy and monitoring of

reproductive health. In developing countries like Pakistan, anemia in pregnancy remains a major health burden and due to lack of research no effective policy or intervention has been carried out to reduce its prevalence [8]. This study was therefore aimed to determine the hemoglobin levels in normal pregnant women and investigate the association of anemia with gestational age, number of antenatal visits, obstetrical complications and mode of delivery.

Methodology:

It was a cross-sectional study conducted at the Lady Willingdon Hospital, Khairpur Mirs, Pakistan from May 2021 to August 2021. A total of 139 normal pregnant women visiting out-patient gynecology units for antenatal visits were recruited by convenient random sampling. Patients were grouped into normal and anemic groups based on serum hemoglobin levels. Anemia was defined as serum haemoglobin concentration <11.0 g/dl. Further anaemia was categorized into mild anemia (haemoglobin = 9–10.9 g/dl), moderate anemia (haemoglobin = 7.0–8.9 g/dl) and severe anemia (haemoglobin < 7.0 g/dl) [9]. Pregnant women of reproductive age with a singleton pregnancy were included in study. Pregnant women with chronic medical disorders, multiple gestation and obstetric complications in present pregnancy were excluded. Gestational age, previous history of obstetrical complications, mode of delivery and fetal outcome were recorded to find its association with anemia. Data was analyzed on SPSS 20.0 (IBM Corp., Armonk, N.Y., USA) [10] and p-value < 0.05 was considered as statistically significant.

Comment [WK1]: If there is an ethics committee decision, it should be added.

Comment [WK2]: which test was used

Results:

Among n=139 normal pregnant women, n=37 women were <34 weeks of gestational age, n=43 women between 34-36 weeks and n=59 women between 37-42 weeks of gestational age. Out of n=139 normal pregnant women, n=26 women had normal hemoglobin levels, n=49 were mild anemic, n=46 had moderate anemia whereas n=18 had severe anemia (Figure I). Overall, the prevalence of gestational anemia was 81%. The hemoglobin status according to gestational age has been shown in Table I, Figure II. Among the pregnant women, who had normal hemoglobin levels, majority had more than 4 antenatal visits (39%). Whereas, most of the pregnant women with anemia had no visit or less than 4 visits (Table II). Majority of the anemic pregnant women had complications in previous pregnancies such as abortion, stillbirth, preterm, anemia (Table III), as compare to normal pregnant women without anemia (p-value<0.001). No significant association was observed between mode of delivery and hemoglobin status.

Figure I: Hemoglobin status in normal pregnant women

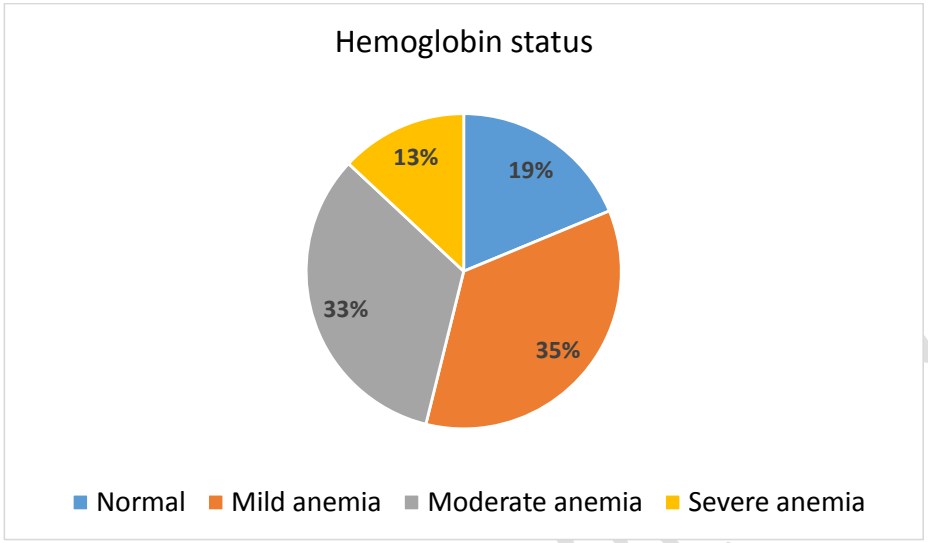

Figure II: Number of patients according to severity of anemia and gestational age

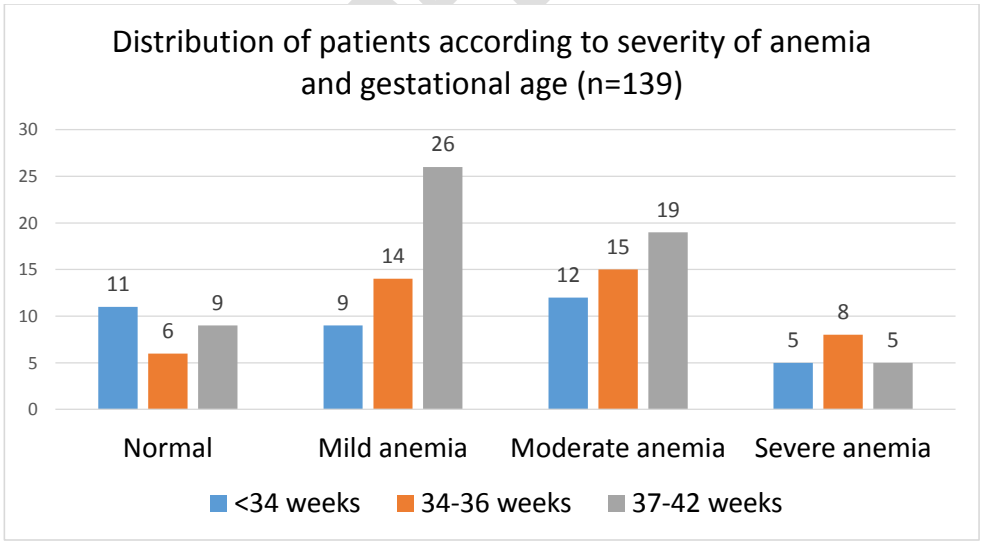

Table I: Distribution of patients according to gestational age and hemoglobin status

Hemoglobin status	Gestational age n (%)			p-value
	<34 weeks n=37	34-36 weeks n=43	37-42 weeks n=59	
Normal	11 (29.8%)	6 (13.9%)	9 (15.3%)	0.239
Mild anemia	9 (24.3%)	14 (32.6%)	26 (44.1%)	
Moderate anemia	12 (32.4%)	15 (34.9%)	19 (32.2%)	
Severe anemia	5 (13.5%)	8 (18.6%)	5 (8.4%)	

Table II: Number of antenatal visits according to hemoglobin status

Hemoglobin status	Antenatal visits n (%)			p-value
	No visit (n=52)	1-3 (n=46)	4 and more (n=41)	
Normal	5 (9.6%)	5 (10.9%)	16 (39%)	**0.009**
Mild anemia	19 (36.5%)	20 (43.5%)	10 (24.4%)	
Moderate anemia	20 (38.5%)	16 (34.8%)	10 (24.4%)	
Severe anemia	8 (15.4%)	5 (10.8%)	5 (12.2%)	

Table III: Complications in previous pregnancies and hemoglobin status

Hemoglobin status	Complications in previous pregnancies n (%)		p- value
	Yes (n=47)	No (n=92)	
Normal	3 (6.4%)	23 (25%)	
Mild anemia	12 (25.5%)	37 (40.2%)	
Moderate anemia	20 (42.6%)	26 (28.3%)	**<0.001**
Severe anemia	12 (25.5%)	6 (6.5%)	

Table IV: Mode of delivery and hemoglobin status

Hemoglobin status	Mode of delivery n (%)		P value
	NVD (n=77)	Caesarean section (n=62)	
Normal	12 (15.5%)	14 (22.6%)	
Mild anemia	27 (35.1%)	22 (35.5%)	
Moderate anemia	24 (31.2%)	22 (35.5%)	0.191

Severe anemia	14 (18.2%)	4 (6.4%)	

Discussion:

In normal pregnancy blood parameters including, hemoglobin, hematocrit, plasma ferritin, and unsaturated iron-binding capacity are altered making the diagnosis and differentiation of pathological anemia from physiological anemia difficult. Iron-deficiency anemia and megaloblastic anemia due to folate deficiency are the common causes of pregnancy anemia, that are frequent in women with nutritional deficiencies and who do not receive antenatal iron and folate supplementations. Other less frequent causes of pregnancy anemia are aplastic anemia, hemolytic anemia, thalassemia and sickle cell disease [11].

In our study, we found that there was significant association of hemoglobin status and number of antenatal visits during pregnancy and complications in previous pregnancies including bad obstetrical history. However, association between gestational age and mode of delivery (normal vaginal delivery vs cesarean section) was non-significant. In the previous study, researchers found link of anemia and maternal and perinatal morbidity and mortality, which requires increase need of health care including feto-maternal intensive care. Anemia also increases risk of preeclampsia, induction of labor, cesarean section, blood transfusions, infections and fetal complications like preterm and small for gestational age births [12].

Heydarpour F et al [13], found the higher risk of neonatal mortality and lower risk of cesarean section in anemic women during the first trimester. It was also noted that the risk of pre-term delivery and abortion were significantly higher in anemic women during the third trimester. In

another study, out of 2417 pregnant women, the gestational anemia was found in 13%. Among the anemic mothers, 31% delivered low birth weight babies, out of which 30% were preterm and 70% were term babies [14].

Sun C-F, et al [15] found the overall incidence of gestational anemia about 30%. It was observed that 4.4% of gestational anemia occurred in first 12 weeks, 9.6% during 13 to 26 weeks and 16.2% after 27 weeks of gestation. It was found that only 24% to 30% of anemia occurring during first 26 weeks could be corrected in final stages of pregnancy.

In the present study, we found that number of antenatal visits had strong association with gestational anemia. It was observed that mothers who had normal hemoglobin levels were more frequently visiting in antenatal period for follow up. Similarly in patients with mild, moderate and severe anemia, majority of the women did not show antenatal visits history. It is clearly observed that women with more antenatal visits are screened early for anemia and are prescribed with iron and folate supplementations, which may reduce the severity of anemia in pregnancy.

In our study, we found the higher prevalence of gestational anemia i.e., 81% as compared to other studies that reported the prevalence of about 25% [16, 17], which may be due to lower socioeconomic condition of our population.

Furthermore, we also found that women with gestational anemia had higher reporting of obstetrical complications in previous pregnancies and bad obstetrical history. In a previously reported study, Rai S and Mishra S, [18] found that 66.5% of women suffered from gestational anemia due to iron deficiency (14.5% were mild anemic, 43% were moderate and 9% were severe anemic). It was observed that various predisposing factors such as heavy menstruation history before pregnancy, higher gravidity/parity and miscarriages were strongly associated with gestational anemia due to iron deficiency.

Conclusion:

In conclusion, we found that gestational anemia is highly prevalent in Pakistan. It is strongly associated with number of antenatal visits in pregnancy and history of previous pregnancies complications. Early detection of anemia and its correction via iron and folate supplementations are recommended to prevent and reduce maternal and neonatal morbidity and mortality.

Consent and ethical approval:

As per international standard or university standard guideline Patient's consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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