

# Study of frequency of anemia among pregnant women in their first trimester in different clinics of Faisalabad

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**Abstract- Introduction:** Anemia represents a decrease in red cell mass or hemoglobin contents of blood below physiological needs (11-12mg/dl) as set by tissues oxygen demand. Physiological adaptation in pregnancy leads to physiological anemia of pregnancy so women in child bearing years are particularly susceptible to iron-deficiency anemia. The reasons are both the loss of blood through menstruation and increase blood supply demands during pregnancy.

**Materials and methods: Study design:** Descriptive cross-sectional study method. **Setting:** It was conducted in Gynecology clinics of Faisalabad, Pakistan. **Duration of study:** 6 months (Jan-June 2019). **Sample Size:** 60 pregnant women. **Sample Technique:** Simple random sampling. **Sample selection:** Pregnant women of first trimester falling in age group of 18-35 years were included while non-pregnant women, pregnant women of second and third trimesters and pregnant women of age < 15 years and > 35 years were excluded. **Data analysis:** SPSS version 20.

**Results:** Out of 60 pregnant women, 73.3% (44) were anemic, of which 36.7% (22) were mildly anemic (10-10.9 g/dl), 30% (18) were moderately anemic (7-9 g/dl) and only 6.7% (4) were severely anemic (<7 g/dl). The rest of 26% (16) were with normal hemoglobin levels.

**Conclusion:** Anemia in pregnancy is the most common health issue which needs prime attention of health care workers because a high percentage of women suffer from it. Therefore women of childbearing age should be provided nutritional education and proper awareness about food sources of iron. Adequate diet before and during pregnancy and proper perinatal care are the need of hour.

**Index Terms-** Anemia, pregnancy, first trimester, Pakistan

## I. INTRODUCTION

Iron is critical to a variety of physiologic processes, including respiration, energy production, and cell proliferation. Iron deficiency is a condition in which the iron availability is insufficient to meet the body's needs

Anemia is generally defined as decrease in hemoglobin concentration or it represents a decrease in red cell mass of blood below physiological needs (11-12mg/dl) as set by tissues oxygen demand. Physiological adaptation in pregnancy leads to physiological anemia of pregnancy so there is more chance to suffer from anemia due to iron deficiency in women during child

bearing years. Hence it is normal to have mild degree of anemia during gestational period. The reasons are both the loss of blood through menstruation and increase blood supply demands during pregnancy.

Anemia has many forms, each of which has its own cause. It can be temporary or long term and may range from mild to severe.

Anemia is characterized by the symptoms of fatigue, generalized weakness, dizziness, headache, shortness of breath, rapid heartbeat, tiredness, frequent sore throat, irritability, decreased appetite and dysphagia. Clinical signs of anemia include skin pallor, pale conjunctiva, blue sclera, dermal and nail changes (brittle nails), lower limb edema, changes in tongue and gums (glossitis and stomatitis respectively), increased heart rate and heart murmur. If a pregnant woman becomes victim of anemia, it is likely that she will get more tired than is expected in pregnant woman without anemia. Risk factors leading to severe anemia in pregnancy include low socioeconomic status, grand multiparity, inadequate child spacing, HIV and malarial infestation<sup>1</sup>.

World Health Organization(WHO) has classified anemia into three categories on the basis of levels of hemoglobin i.e. normal hemoglobin is 11-12 gm/dL, mild anemia with hemoglobin 10-10.9 gm/dL, moderate anemia with hemoglobin 7-9.9 gm/dL and severe anemia with hemoglobin <7 gm/dL<sup>2</sup>.

The causes of anemia during gestation may include malnourishment, loss of blood, chronic illness, unhealthy lifestyle, multiparity, alcohol and smoking<sup>3</sup>. If the diet does not contain enough protein, iron, vitamin B12 and folic acid and many other mineral and vitamins which are required for the hemoglobin production and RBCs formation, there are chances of occurrence of nutritional anemia. Iron is an essential requirement for hemoglobin production, red blood cells protein which helps in transporting oxygen to the other cells of our body.

Iron deficiency anemia (IDA) is considered to be one of the most vital factors of anemia (WHO, 2002).

Anemia can occur when your blood doesn't have enough red blood cells. This can happen if: Your body doesn't make enough red blood cells

Bleeding also causes you to lose red blood cells more quickly than they can be replaced.

Globally anemia is an utmost health issue affecting almost 42% pregnant ladies<sup>4</sup>. it is a public health issue. 18% pregnant ladies are found anemic in developed states while prevalence of anemia in under developed states 35 – 75% <sup>5</sup>. World Health Organization's (WHO) recent estimates show prevalence of anemia in pregnant ladies to be 41.8% worldwide, out of which 52.5% is in South- East Asia<sup>6</sup>. In Pakistan preponderance of

anemia among women aged 15-44 is calculated to be 47% in rural areas and 26% in urban areas<sup>7</sup>.

Indian subcontinent has 50% of the world's anemic women of which 88% develop anemia during gestational period<sup>8</sup>. A prominent drop in mean hemoglobin was noticed as pregnancy progressed, those with gestational age below 6 months had mean hemoglobin of 11g/100ml while those above 6 months of gestation had mean hemoglobin of 10.6g/100ml<sup>9</sup>. Another study done under Demographic and Health Surveys' classification on 214 pregnant women showed that 40% of them were anemic (less than 11g/dL) out of which 194 (90.7%) were mildly anemic (10- 10.9g/dL) and 20 (9.3%) were moderately anemic (7-9g/dL) whereas no case of severe anemia (<7g/dL) was recorded<sup>10</sup>.

Untreated anemia is associated with intra-uterine growth retardation, low fetal iron stores, fetal iron deficiency anemia and increased perinatal mortality and morbidity<sup>11</sup>. Even a moderate hemorrhage in an anemic pregnant woman can be fatal. In the highlight of above stated serious consequences of anemia during pregnancy, antenatal early detection and management is required<sup>12</sup>.

**Objective:** Our aim was to assess the frequency of anemia in the first trimester of pregnancy in age group of 18-35 years.

## II. MATERIALS AND METHODS

### i) Study design:

Descriptive cross-sectional study method.

### ii) Setting:

It was conducted in Gynecology clinics of Faisalabad, Pakistan.

### iii) Duration of study:

6 months (Jan-June 2019).

### iv) Sample Size:

60 pregnant women.

### v) Sample Technique:

Simple random sampling.

### vi) Sample selection:

Pregnant women of first trimester falling in age group of 18-35 years were included while non-pregnant women, pregnant women of second and third trimesters and pregnant women of age < 15 years and > 35 years were excluded.

### Data collection procedure:

We collected reports of hemoglobin level of pregnant women of first trimester visiting gynecology OPDs, clinics and from general population. We also gave them a close ended well structured questionnaire.

### Data analysis:

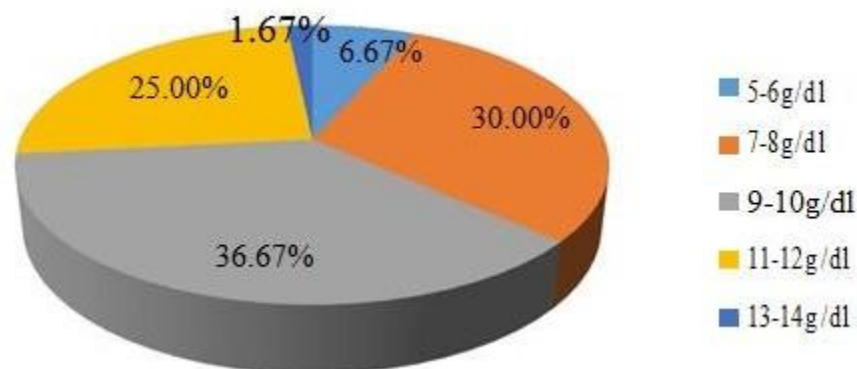
We analyzed our data through SPSS version 20 using chi square test.

## III. RESULTS

Many factors including age, education, socioeconomic status, parity and symptoms of anemia like face pallor, fatigue, tachycardia and dizziness were associated with the levels of hemoglobin to assess the frequency of anemia during first trimester in pregnant women.

According to our study out of total 60 pregnant women, 73.3% (44) women were found to be anemic. Of these 73.3% women, about 36.7% (22) were mildly anemic (9-10g/dl), 30% (18) were moderately anemic (7-8g/dl) and only 6.7% (4) were severely anemic (<7g/dl). The rest of 26% (16) were with normal hemoglobin levels (11-12g/dl). Out of 43 multiparous women, 23 were found to be anemic while 11 nulliparous women out of 17 were anemic. All 8 illiterate pregnant women were found to be anemic of various degrees while most of the literate women were mildly anemic. Approximately 53.3% pregnant women complained of face pallor, 78.3% complained of fatigue and 66.67% complained of dizziness in their first trimester.

**Figure 1:**  
**Hemoglobin levels among pregnant women**



This pie chart shows that 36.6% and 25% of pregnant women found to have Hb levels 9-10g/dl and 11-12g/dl respectively. 30% of women have Hb levels 7-8g/dl and 6.67% have Hb levels 5- 6g/dl. Only 1.67% of pregnant women have Hb levels of 13-14g/dl.

**Table 1:**  
**Age group and socio-economic status of surveyed population**

Age group	Percentage %	Socio-economic status	Percentage%
18-20 years	11.7%	Lower class	35%
21-23 years	30.0%	Middle class	43.3%
24-26 years	28.3%	Upper class	21.7%
27-29 years	8.3%		
30-32 years	10.0%		
33-35 years	11.7%		

table shows that 28-30% of women in surveyed group lie in the age group of 21-26 years. 10- 11% of pregnant women were of 30-35 years of age and 11% of women were 18-20 years of age. It also shows that 21% of women belong to higher socio-economic status while 35% belong to poor socio-economic status.

**Table 2:**  
**Relation between twin pregnancies in women and hemoglobin levels**

Woman with twin pregnancy	Hemoglobin level				
	5-6g/dl	7-8g/dl	9-10g/dl	11-12g/dl	13-14g/dl
YES	—	42.9%	28.6%	28.6%	—
NO	7.5%	28.3%	37.7%	24.5%	1.9%

This table shows that 42.9% women with twin pregnancies have 7-8g/dl Hb levels and there is not a single case with Hb levels 13-14 g/dl.

**Table 3:**  
**Relation between number of pregnancies in women and hemoglobin levels**

No of pregnancies	Hemoglobin level				
	5-6g/dl	7-8g/dl	9-10g/dl	11-12g/dl	13-14g/dl
1	15.8%	15.8%	31.6%	31.6%	5.3%
2	5.0%	25.0%	30%	40%	—
3	—	33.3%	55.6%	11.1%	—
4	—	66.7%	33.3%	—	—
5	—	40%	60%	—	—

7	---	100%	---	---	---
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This table shows that women with more number of pregnancies have comparatively lower levels of Hb falling in ranges 7-8g/dl, 9-10g/dl as compared to women with less number of pregnancies in which Hb levels mostly fall in ranges 9-10g/dl, 11-12g/dl, 13-14g/dl.

**Table 4:**  
**Relation between socioeconomic status of pregnant women and their hemoglobin levels**

	Haemoglobin level					Total
	5-6g/dl	7-8g/dl	9-10g/dl	11-12g/dl	13-14g/dl	
lower class	4	10	7	0	0	21
Socio-economic middle class	0	6	13	7	0	26
status upper class	0	2	2	8	1	13
Total	4	18	22	15	1	60

The above table shows that more number of surveyed women belong to middle class and of them more women have hemoglobin level in the range of 9-10g/dl.

The chi-square value of this relation is 29.719 with p-value 0.00.

**Table 5:**  
**Relation between age and hemoglobin level of the pregnant ladies**

	Haemoglobin level					Total
	5-6g/dl	7-8g/dl	9-10g/dl	11-12g/dl	13-14g/dl	
18-20 Years	2	2	0	3	0	7
21-23 Years	1	3	9	5	0	18
24-26 Age years	1	6	5	4	1	17
Group 27-29 Years	0	1	3	1	0	5
30-32 Years	0	0	5	1	0	6
33-35 Years	0	6	0	1	0	7
Total	4	18	22	15	1	60

The above table shows that more number of pregnant women fall in age group of 21-23 years of which 4 women have hemoglobin level below 8g/dl, 9 have hemoglobin level in the range of 9- 10g/dl and 5 have hemoglobin level in the range of 11-12g/dl.

The chi-square value of this relation is 31.314 with p value 0.051, which is a significant value.

#### IV. DISCUSSION :

Anemia during pregnancy is a supreme health issue especially in under developed countries like Pakistan. The status of anemia in pregnant women of first trimester remains the same even after following many anemia control programs in different countries<sup>13</sup>. In our study we have found a high frequency of anemia among pregnant ladies of first trimester.

Our study included 60 pregnant ladies out of which 73.3% (44) were found to be anemic while the rest of 26.67% (16) were with normal hemoglobin count. Out of those 44 anemic women, 36.7% (22) were found to be mildly anemic, 30% (18) were found to have moderate anemia and 6.7% (4) were critically anemic. According to a study 36.1% of all surveyed pregnant women had anemia out of which 58% were mildly anemic, 35.7% were moderately anemic and 5.8% were severely anemic<sup>14</sup>, which was near to the percentile obtained in our research.

According to another study done in Nekemte Ethiopia, 64% pregnant women were found to be mildly anemic and 21.8% were moderately anemic<sup>15</sup>, which was a bit different from our results. The frequency of anemia in our study, 73.3%, was different from that found by study in Enugu, 40.4%<sup>16</sup>.

According to a study done in China pregnant women from 13 different countries were surveyed with hemoglobin cut off less than 10g/dl (Chinese Standard) the prevalence of anemia came out to be 69%<sup>17</sup>. In a study on the prevalence of anemia in Pakistan, report shows 96% pregnant population of Multan area were anemic<sup>18</sup>. Similarly a study done among Pakistani pregnant ladies showed that out of 250 surveyed women, 138 (55%) were anemic. Out of which 83(60%) were moderately anemic, rest 55 women (40%) were mildly anemic. No case of severely anemic was discovered<sup>19</sup>.

According to our study out of 60 pregnant women, 43 were multiparous with 16 mildly anemic (9- 10gm/dl), 15 were moderately anemic (7-8gm/dl) and 2 were dangerously anemic (less than 7 gm/dl). However the remaining 10 were in normal range (11-12gm/dl). At every pregnancy, maternal iron stores are reduced due to excessive post-partum bleeding thus causing women with multiple pregnancies having more risk to become anemic. While in a study done in Turkey to check out the pervasiveness of anemia in pregnant women it was found that anemia was 2.2 times more prevailing in women who had at least four or more than four children than the ones with fewer children<sup>20</sup>. However a study done in Enugu, mother's age and her number of pregnancy showed no association with pervasiveness of anemia<sup>21</sup>. A town named Mekelle in Northern Ethiopia, another study was carried out to find out different factors affecting anemia among pregnant ladies, 38 women with less than 2 number of pregnancies (12.3%) were anemic and 248 (87.7%) were non-anemic. Whereas women who had more than or equal to two number of pregnancies 84 (25.2%) were anemic, however 249 (74.8%) were non-anemic<sup>22</sup>.

According to our study out of total 8 illiterate respondents, 1 was severely, 6 were moderately while 1 was mildly anemic. Talking about patients with primary education, out of 10, 2 were severely, 3 were moderately, 4 were mildly anemic while 1 was with normal hemoglobin level. Taking in account of women with education up to middle level out of 15, 1 was severely, 5 were

moderately, 5 were mildly anemic while 4 were normal. Lastly, talking about subjects with education level of matric and above out of 27, number of severely, moderately and mildly anemic respondents were 0, 4 and 12 respectively whereas 11 of the subjects were with normal hemoglobin level. According to anemic status, demographic and anthropometric characteristics of pregnant ladies in Hyderabad Pakistan, pregnant women with no formal education showed that 35 (out of 130) have no anemia, 321 (out of 1024) have mild anemia and 97 (out of 212) have moderate to severe anemia. While pregnant women with formal education 122 (out of 130) have no anemia, 703 (1024) have mild anemia while 115 (out of 212) have moderate to severe anemia<sup>23</sup>.

**Limitations:** A few factors limited the results of our descriptive cross-sectional study which included our limitation to gynecological wards and clinics of Faisalabad, small sample size and uncooperativeness of patients hence the results of our study are indicative but not necessarily applicable to all other districts and regions.

**Recommendations:** In order to circumvent the complications due to anemic status of pregnant ladies, there is a need to educate women to have a good dietary consumption and to have a regular medical checkup in this period. The government should make sure the proper implementation of family planning programs so that strong relationship of anemia with multiparity can be alleviated.

#### V. CONCLUSION

Anemia in pregnancy is the most common health issue which influences birth weight and preterm delivery and needs prime attention of health care workers of our country. During the first trimester of gestation it was found that a high percentage of women had anemia and multiple factors were associated with it. Through our study we came to know that most of the surveyed pregnant women were suffering from mild to moderate degree of anemia while a less number of women were found to be severely anemic. We obtained a significant relation between mother's age and anemia. In our research we also discovered a significant association between socioeconomic status of pregnant women and their hemoglobin level according to which mild to moderate anemia was more prevalent in women with lower to middle socioeconomic status while severe anemia was found only in women belonging to lower socioeconomic class. Our study also showed that there is a positive correlation between education status of pregnant women and their hemoglobin levels. Increase in number of pregnancies increased the degree of anemia in pregnant women. High frequency of anemic patients during pregnancy are due to increased demand of micro nutrients during this period in background of poor dietary habits. It is also suggested that nutrition plays very important role in causing anemia during pregnancy. Women with higher education level had maximum hemoglobin count. This shows that literacy rate in pregnant women drastically affects hemoglobin levels for which proper education of women is required. As anemia during pregnancy continues to be a common problem therefore proper awareness about anemia, adequate healthy diet before, during and after pregnancy and proper perinatal care are the need of hour. A high level of anemia in pregnant ladies apparently increased the mental

and fetal risks therefore early diagnosis and treatment of anemia should be given priority.

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