Severity of Iron Deficiency Anemia In Pregnancy With Fetomaternal Outcomes

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ABSTRACT

Objective — *To find the severity of iron deficiency anemia in pregnancy along-with fetomaternal outcomes.*

Study design — *Cross sectional study.*

Place & Duration of study — *Department of Obstetrics and Gynecology Unit I, Shaikh Zayad Women's Hospital Larkana, from March 2023 to September 2023*

Methods — *Pregnant women were selected through non-probability purposive sampling. Detailed history was taken and clinical examination performed. Nutritional status was assessed and dietary habits were inquired in particular. Hemoglobin, serum ferritin and total iron binding capacity levels were estimated. Gestational period was monitored for any maternal and fetal complications. Delivery related events and status of the newborns were also noted. Statistical analysis of the data were done to report the outcomes as frequencies and percentages and their relationship with the severity of anemia.*

Results — *A total of 100 pregnant women were included. The age of the participants was between 18 to 40-years. Forty-one (41%) women were between 26 to 30-years of age. Majority (n=63 – 63%) of the women belonged to the low socioeconomic group and had rural background (n=62 – 62%). Seventy-four (74%) women had moderate anemia. Twenty-five (25%) women had low ferritin levels (5- 10 mg/ L) while 40% had moderate levels (10-50 mg/ L). A total of 56% women had cesarean delivery, 16% experienced postpartum hemorrhage, and 12% developed cardiac failure. There were 20% intrauterine deaths and 8% maternal deaths in this series. In addition, 12% neonatal deaths occurred.*

Conclusion — *The iron deficiency anemia had huge effect on pregnancy, labor and newborns as gestational period was difficult to manage and delivery was challenging with poor maternal and fetal outcome. A large number on newborns also died.*

Key words — *Anemia, Pregnancy, Postpartum hemorrhage, Ferritin level, Maternal mortality.*

INTRODUCTION:

Anemia is commonly found among pregnant women. This is a major public health concern in low-middle income countries where about 40% of expectant mothers suffer from it.[1] According to World Health Organization (WHO) definition, a hemoglobin level below 11.0 gram /dl is defined as anemia.[2] It is reported as one of the leading causes of maternal mortality.[3] Anemia is more frequent during pregnancy in African and Asian countries. A wide range in the prevalence of pregnancy related anemia is reported due to socioeconomic reasons, lifestyles, and health-seeking habits of people in different nations and cultures, as well as the obstetrics and gynecological facilities available to the expectant women.[4]

Various causes of anemia in pregnancy are reported of which iron deficiency is most common.[5] Other

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causes include deficiencies of other vitamins like folic acid, riboflavin, vitamins A and B12.[6] Similarly, the increased incidence of anemia in sub-Saharan Africa is also linked to communicable diseases like HIV, helminths infestations, and malaria.[7] Severe anemia (Hb< 7 gm/dl) in pregnancy is linked to number of significant fetomaternal outcomes. They range from varied degrees of morbidity as well as mortality among women and newborns. It increases the risk of intrauterine fetal growth restriction, fetal demise, preterm delivery and neonatal death. Given the detrimental effects of anemia during pregnancy, the World Health Organization recognizes lowering maternal death as one of the health-related Millennium Development Goals.[8]

As anemia is one of the leading causes of death and disability finding out its prevalence continues to be a crucial public health challenge. The incidence of anemia in general population is a helpful metrics that can be used to predict anemia in pregnancy and evaluate the effects of treatment strategies. Research on finding out the incidence of anemia is also helpful in tracking the reproductive health policies. The purpose of this study was to find out the frequency of iron deficiency anemia as well as pregnancy related complications including intrapartum hemorrhage, postpartum hemorrhage, fetal progress and perinatal outcomes.

METHODS:

Study design, place & duration: This was a cross sectional study conducted in the Department of Obstetrics and Gynecology Unit I, Shaikh Zayad Women's Hospital Larkana, from March 2023 to September 2023.

Ethical considerations: Informed consent was taken from the study participants. The approval of data collection was taken from the concerned unit and the ethical review committee of Shah Abdul Latif University Khairpur No.68 dated 22-03-2024.

Inclusion criteria and exclusion criteria: Pregnant women of reproductive age who presented either in antenatal clinic or in labor, were enrolled. They included both primigravida and multigravida, in all trimester of pregnancy. Women with comorbid like diabetes mellitus, hypertensive disorders in pregnancy, cardiac diseases and other medical disorders, were excluded.

Sample size estimation: A convenience sample of 100 pregnant women who reported during the study period was taken. Formal sample size calculation was not done. The sample was considered as representative of the study population of the unit where study was conducted.

Study protocol: A thorough medical history was taken and physical examination performed. Laboratory tests such as hemoglobin level, hematocrit (HCT), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC), were requested. Iron deficiency was determined by measuring serum ferritin level, and total iron binding capacity (TIBC).

Variables studied included demographic data, maternal and fetal complications like antepartum hemorrhage (APH), postpartum hemorrhage (PPH), duration of labor, obstructed labor, type of delivery (normal vaginal, instrumental delivery or cesarean section). Fetal assessment included intrauterine growth restriction (IUGR), fetal demise (FSB, MSB, NND), and prematurity of baby.

Statistical analysis: Numerical data were presented as mean and SD while categorical data as frequency and percentages.

RESULTS:

The age of the women was from between 18 to 40-years. Most of the women (n=41- 41%) were between 26 to 30-years, of low socioeconomic group (n=63 – 63%) and from rural background (n=62 – 62%). Details are given in table I.

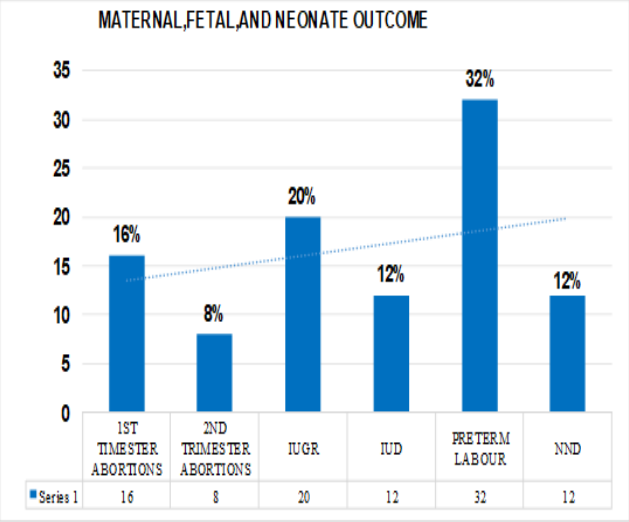
A total of 74 (74%) pregnant women suffered from moderate anemia, 12% had mild and 14% severe anemia. Twenty-five (25%) women had low ferritin levels (serum ferritin level: 5- 10 mg/ L), 40% had moderate levels (serum ferritin level: 10-50 mg/ L), 15% had better iron status (serum ferritin level: 50-150 mg/ L), and 20% (normal serum ferritin level: 150-300 mg/L). Total iron-binding capacity showed that 18% had low levels (<200 mcg/dl), 22% moderate levels ((200-400 mcg/dl), and 60% high levels ((400-600 mcg/dl). Elevated TIBC levels may indicate iron deficiency or insufficient iron stores. In this series 56% of women had cesarean delivery, 16% experienced postpartum hemorrhage while 12% developed disseminated intravascular coagulation, and 8% developed cardiac failure. Eight maternal deaths were noted. Other pregnancy, fetal and neonatal related complications are shown in Figure I.

DISCUSSION:

This study reported a high frequency of iron deficiency anemia in pregnant women. This is quite similar to the data reported from other developing

Table I: Demographic Profile of the Study Participants

Demographic variable	Frequency (n=100)	Percentage (%)
Age		
18-25 years	29	29%
26-30 years	41	41%
31-35 years	18	18%
36-40 years	12	12%
Socioeconomic Status		
Low-Income Group	63	63%
Middle-Income Group	27	27%
High-Income Group	10	10%
Place of Residence		
Rural	62	62%
Urban	38	38%



countries. A study from Uttar Pradesh India found an overall prevalence of anemia of about 65% in women.[9] According to World Health Organization (WHO) about half a billion women of reproductive age between 15 - 49 years, suffer from anemia.[10] In pregnant women these figures increase. This is more prevalent in Africa and South East Asia.[11] Pakistan is one of the countries located in this geographical region. It is pertinent to mention here that WHO goal to decrease the frequency of anemia by 50% may not be achieved.[12]

There are other causes of anemia in general and particularly during pregnancy. This includes folic acid and other vitamins deficiencies as well. The focus of this study was about iron deficiency anemia only. Iron and folic acid deficiencies were the main causes of the high prevalence of mild to severe anemia in pregnant women from rural Sindh, Pakistan as reported by Shahani et al. The pregnant women therefore should be managed according to their needs.[13]

In a study from Sindh, Pakistan the frequency of mild, moderate and severe anemia among mostly uneducated adolescent women was 69.9%, 28.8% and 1.3% respectively.[14] Similarly, number of studies from different geographical regions of Pakistan have reported various frequencies that tantamount to the fact that it is a public health issue which has a great bearing for pregnant women. In addition, it also affects fetus and newborns. We have noted a high intrauterine deaths and neonatal deaths in this series.[15,16] Studies reported not only nutrition related issues like its availability but also dietary preferences. In addition, intestinal helminths infection and prevalence of anemia in a geographical region also adds to the burden. Other risk factors are also reported from African countries.[17]

The need for iron increases particularly during the third trimester of pregnancy.[5] Most of the women in our study had moderate anemia. Severe anemia was noted in 14% women. Patients with severe anemia are more likely to encounter a fetal loss as well as prenatal deaths. The frequency of low birth weight babies also increases as IUGR is frequently associated. In our study the frequency of IUGR was 32%. This is an alarming situation as postnatal outcome and chances of early neonatal deaths and infant mortality also increase. Similar findings are also reported previously.[18]

Limitations of the study: It was a descriptive study of six-month duration from one unit of a tertiary care hospital. Nation-wide statistics may provide more holistic data on the subject.

CONCLUSION:

Iron deficiency anemia of moderate severity was found in about 75% of the pregnant women. A high frequency of maternal, fetal and neonatal adverse outcomes was observed in these women with 20% intrauterine and 12% neonatal deaths. These figures highlight the need of an organized antenatal care as well as awareness drive among general public especially reproductive age women and healthcare providers.

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Majid Ansari: Research supervision and critical review of manuscript.

All authors approved final revised version and are responsible for the content of the article.

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