

Operative Procedures and Blood Transfusion Needs During Pregnancy and Labor In Women With Iron Deficiency Anemia

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ABSTRACT

Objective	To assess how frequently anemic pregnant women require surgery and blood transfusions during pregnancy and childbirth.
Study design	Descriptive case series.
Place & Duration of study	Department of Obstetrics & Gynecology, Shaikh Zayad Women Hospital, Chandka Medical College Larkana. from January 2024 to July 2024.
Methods	Primigravida and multigravida admitted to the obstetrics ward were included. Data were collected about the duration of pregnancy, number of previous pregnancies, presence and severity of iron deficiency anemia, mode of delivery, number of blood transfusions required, and the operation performed on the anemic women. The data were entered into Microsoft Excel 13 software and analyzed. Descriptive statistics were used to present the data.
Results	A total of 50 women were included. Among them 25 were booked cases. In 27 (54%) women intense labor pain was reported. Nine (18%) women had previous cesarean sections. Moderate anemia was found in 37 (74%) women and 74% of patients required blood transfusions. Thirty-three (66%) women had operative deliveries by cesarean sections. No maternal mortality was noted.
Conclusion	Moderate iron deficiency anemia was present in majority of the women and required blood transfusion. Nearly 2/3 rd of the women needed cesarean section for delivery.
Key words	Anemia, Blood transfusion, Cesarean section, Pregnancy, Labor.

INTRODUCTION:

Iron is an important micronutrient which is necessary for maintaining a variety of metabolic processes including electron transfer, enzyme activity, and oxygen transport in the body. It is found in diet rich in plant-based non-hem and animal-based hem which can be found in spinach, liver, and beans.¹ These

are freely available all over Pakistan even in the remote areas. Women need about 40 mg/kg of iron for proper body functioning. Hemoglobin is found in erythrocytes while 20% of iron is stored in the reticuloendothelial framework.²

During pregnancy the need for iron increases which is required for the fetal growth as well. It also results in increase absorption of iron which is controlled by the placenta. However, after 30 weeks of gestation majority of the iron passes from mother to fetus freely.³ A normal fetus requires 500–800 mg of maternal iron during pregnancy, with an average daily demand of 4.4 mg throughout the entire pregnancy. Fetal iron demand varies from 0.8 mg during the first trimester to 7.5 mg during the second and third trimesters.⁴

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Iron deficiency anemia is the most prevalent cause of anemia during pregnancy with 75% of cases occurring during pregnancy due to inadequate iron in diet.⁵ Iron deficiency anemia also adversely affect the pregnancy. In order to physiologically compensate for the growing demands of the fetus and placenta, the plasma volume is increased by 40–50% during pregnancy. Iron supplementation can help in minimizing the detrimental effects on pregnant women and fetuses.⁶

Hemoglobin levels below 11 g/dl during all three trimesters of pregnancy and below 10 g/dl during the postnatal period is considered as anemia by WHO.⁷ Anemia is classified as mild (10.0–10.9 g/dl), moderate (7–10 g/dl), severe (<7 g/dl), and severe (<4 g/dl) based upon hemoglobin level.⁸

The process of labor in a pregnant woman is also critical endangering the life of mother and her fetus. The prevalence of anemia in general in women and during pregnancy as well as during labor is considered a significant contributor to maternal and fetal morbidity and demise. This study was conducted to find out the frequency of iron deficiency anemia during pregnancy, need of blood transfusion and its effect on fetus and the process of labor in a rural part of the country among low socioeconomic status women.

METHODS:

Study design, place & duration: This descriptive study was conducted in the Department of Obstetrics & Gynecology, Shaikh Zayad Women Hospital Larkana, from January 2024 to July 2024.

Ethical considerations: Ethical review board approval was obtained from the Shah Abdul Latif University Khairpur letter No.90 dated 10/04/2024. Informed consent was obtained from the pregnant women.

Inclusion and exclusion criteria: Pregnant women of reproductive age group irrespective of parity and booking status, were included. Any women who presented with the complications of pregnancy carried out at other centers were excluded.

Sample size estimation: Formal sample size was not calculated. All women with iron deficiency anemia who visited the study site were included.

Study protocol: Patient demographic information, including age, parity, gravid, current complaints, medical history, prior history of cesarean section and history of blood transfusions were collected on a pre designed form. Clinical assessment was made

for their vital signs, presence of pallor, and BMI. Ultrasound was done to document the status of gestation and fetus. Blood was sent for estimation of hemoglobin levels. Process of labor in those who presented in emergency was noted. Any surgical intervention done for delivery and blood transfusion required were also recorded. Maternal and fetal outcomes were documented.

Statistical analysis: Anemia status, severity, and other categorical data were reported as numbers and proportions and continuous data as mean $\pm$ SD. SPSS version 19 was used for computing statistics that were collected on Excel sheet.

RESULTS:

A total of 50 women with iron deficiency anemia were included. Twenty-seven (54%) women presented with labor pain. Nine (18%) females already had one previous cesarean section, four (8%) with two, four (8%) with three and two (4%) with four previous cesarean sections. Per vaginal bleeding was reported in two, a woman presented with twin pregnancy and other with in-utero fetal demise. Six (12%) women had mild anemia, 37 (74%) moderate and seven (14%) with severe anemia.

Thirty-three (66%) women underwent cesarean sections. Thirty-seven (74%) women required blood transfusions due to blood loss or general health related conditions due to anemia. This included 23 (46%) who underwent cesarean section and 14 (28%) who had normal vaginal delivery.

DISCUSSION:

This study highlights an important clinical issue of iron deficiency anemia in pregnancy and its effect on labor as well as fetus. The frequency of anemia in pregnant women is a significant challenge for the government as it delivers reproductive health services. This is a pressing issue that should be regarded as a significant public health concern. According to WHO data, women from low and middle income countries have highest prevalence of iron deficiency anemia in general as well as during pregnancy.⁹

Iron deficiency anemia is a risk factor for the developing fetus as well as to the pregnant woman due to high incidence of complications during pregnancy and labor. The anemic pregnant women leaded to IUGR in 6 babies, low birth weight in 3 babies, and anemic newborn in 2 babies. The complications include preterm labor in 3 pregnant women, 9 with rupture of the membrane, 4 with

obstetric labor, 8 antepartum hemorrhage, 12 with postpartum hemorrhage, 2 with DIC, 4 were with severe blood transfusion reaction, 1 heart failure, and with maternal death. Low hemoglobin causes palpitations, breathing difficulties, pallor swelling on the face and feet, dizziness, and these add to the obstetrical complication.¹⁰

The risk of blood transfusions is increased in women who present in emergency. This was found in our study. These patients are at an increased risk. Thus all pregnant women need proper antenatal screening which is often not done. The risks of blood transfusions include transmission of diseases like hepatitis C and B, and HIV to name a few. In addition, the blood transfusions related reactions may occur.¹⁰ Blood transfusions should be done with extreme care and monitoring is must for early and delayed reactions. Appropriate drugs and equipment must be present in case adverse event occur. In this series a large number of women required blood transfusions even those who had normal vaginal delivery. These women presented in emergency with labor pains delivered without any complication.

Iron deficiency anemia can be prevented, treated, and cured. WHO estimates that 50% of anemia is caused by iron deficiency. A number of factors, such as poverty, poor nutrition, diet low in iron, low socioeconomic status, large families living in small homes, using water pumps, and multiple pregnancies can lead to iron deficiency anemia in developing countries. This may be considered as a health system top priority. Organized public health measures can go a long way to lower the incidence of anemia thus minimizing and controlling fetal-maternal issues, the need of blood transfusion and improving the national health standards.¹¹

Limitations of the study: This study has a small sample size, of short duration with descriptive design. A large community based data collection on the same subject can provide more robust data based upon which policies can be made for women living in a rural set up.

CONCLUSION:

Iron deficiency anemia was found in majority of the pregnant women who presented to our facility for reproductive health services. A large number of them required blood transfusions. More than half of the women had cesarean section in this series. Proper antenatal care may reduce feto/maternal outcome morbidity and mortality.

REFERENCES:

1. Auerbach M, Abernathy J, Juul S, Short V, Derman R. Prevalence of iron deficiency in first trimester, nonanemic pregnant women. *J Matern Fetal Neonatal Med.* 2021;34(6):1002-1005. doi: 10.1080/14767058.2019.1619690.
2. Geng F, Mai X, Zhan J, Xu L, Georgieff M, Shao J, et al. Timing of iron deficiency and recognition memory in infancy. *Nutr Neurosci.* 2022;25(1):1-10. doi: 10.1080/1028415X.2019.1704991.
3. Bastian TW, von Hohenberg WC, Georgieff MK, Lanier LM. Chronic Energy Depletion due to Iron Deficiency Impairs Dendritic Mitochondrial Motility during Hippocampal Neuron Development. *J Neurosci.* 2019;39(5):802-813. doi: 10.1523/JNEUROSCI.1504-18.
4. Kemper AR, Fan T, Grossman DC, Phipps MG. Gaps in evidence regarding iron deficiency anemia in pregnant women and young children: summary of US Preventive Services Task Force recommendations. *Am J Clin Nutr.* 2017;106(S6):1555S-18S. doi: 10.3945/ajcn.117.155788.
5. Barry MJ, Nicholson WK, Silverstein M, Chelmow D, Coker TR, Davis EM, et al. Folic acid supplementation to prevent neural tube defects: US Preventive Services Task Force Reaffirmation Recommendation Statement. *JAMA.* 2023;330(5):454-459. doi: 10.1001/jama.2023.12876.
6. Liu Y, Li N, Mei Z, Li Z, Ye R, Zhang L, et al. Effects of prenatal micronutrients supplementation timing on pregnancy-induced hypertension: Secondary analysis of a double-blind randomized controlled trial. *Matern Child Nutr.* 2021;17(3):e13157. doi: 10.1111/mcn.13157.
7. Alem AZ, Efendi F, McKenna L, Felipe-Dimog EB, Chilot D, Tonapa SI, et al. Prevalence and factors associated with anemia in women of reproductive age across low- and middle-income countries based on national data. *Sci Rep.* 2023;13(1):20335. doi: 10.1038/s41598-023-46739-z.

8. Georgieff MK. Iron deficiency in pregnancy. *Am J Obstet Gynecol.* 2020;223(4):516-524. doi: 10.1016/j.ajog.2020.03.006. Received for publication: 01-07-2025
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9. Freeman HJ. Iron deficiency anemia in celiac disease. *World J Gastroenterol.* 2015;21(31):9233-8. doi: 10.3748/wjg.v21.i31.9233. Authors' contributions:
Shabana Bano Soomro: Data collection and analysed.
Majida Ali: Concept, data collection, analysis and manuscript writing.

10. Di Renzo GC, Spano F, Giardina I, Brillo E, Clerici G, Roura LC. Iron deficiency anemia in pregnancy. *Womens Health (Lond).* 2015;11(6):891-900. doi: 10.2217/whe.15.35. Mehwish Memon: Data collection and analysed.
SairaBano Saima: Data collection and analysed.
Shazia Shaikh: Manuscript writing
Shumaila: Data collection and analysed.

11. Means RT. Iron Deficiency and Iron Deficiency Anemia: Implications and Impact in Pregnancy, Fetal Development, and Early Childhood Parameters. *Nutrients.* 2020;12(2):447. doi: 10.3390/nu12020447. All authors are responsible for the revised manuscript and content of the study.

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