



ANEMIC PATIENTS; RELATIONSHIP OF FREQUENCY AND SEVERITY OF IRON DEFICIENCY ANEMIA WITH PRETERM LABOR AND EVENTUAL PERINATAL OUTCOME

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INTRODUCTION

The female population in our society suffers from number of nutritional problems. Iron deficiency anemia is the commonest nutritional deficiency problems during gestation and comprises 95% of the anemia seen in pregnancy. It is responsible for the 1/5th of high maternal death rate.¹⁻⁴

Existing data suggest that maternal iron deficiency and particularly iron deficiency anemia may be associated with detrimental effects on maternal and infant health and particularly with a high risk of prematurity, delivery of low birth weight neonates and a high perinatal mortality.⁵

Preterm labor is defined as labor, which occurs from the viability of the fetus until completion of 37th week of gestation. Anemia by causing hy-

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ABSTRACT: Pregnant women are particularly considered to be the most vulnerable group because of the additional demands that are made on maternal stores during pregnancy. The iron deficiency anemia is the most common nutritional deficiency problems in females and is responsible of high maternal death rate in our society. **Objectives:** To determine the relationship of frequency and severity of iron deficiency anemia to preterm labor and eventual perinatal out come in anemic patients. **Study Design: It was** a case control study. **Study Setting:** In Obstetrics and Gynecology Unit-III, Sir Ganga Ram hospital, Lahore from July 2012 to June 2013. **Methodology:** The study was conducted on 200 patients (100 cases and 100 controls) were studied. Cases were patients admitted in labor room with preterm labor and Controls were females in labor at term at. Convenience sampling was done. On admission relevant history taking examination and investigation were done. The data was collected on a Performa. **Results:** There were 50 patients with anemia amongst the patients with preterm labor. In the control group, 40 patients were suffering from anemia. In the patients with preterm labor the mean hemoglobin was 9.83 grams/deciliter. In the control group the mean hemoglobin was 10.3gm/dl. (Pregnant women having hemoglobin <10gm/dl are considered to be anemic). The odds ratio was calculated to be 3.4 and P value was <0.05. **Conclusions:** Iron deficiency anemia was associated with increased risk for low birth weight, preterm delivery, and perinatal mortality. The frequency of iron-deficiency anemia was seen in both groups of pregnant women.

Key words: Hemoglobin, iron deficiency anemia, preterm labor, thalassemia minor, perinatal mortality.

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poxia and iron deficiency by increasing serum nor-epinephrine can induce maternal and fetal stress, which stimulates the synthesis of corticotrophin releasing hormone (CRH). Elevated CRH concentrations are a major risk factor for preterm labor. Iron deficiency may also increase the risk of maternal infections, which can stimulate the production of CRH and is a major risk factor for preterm labor.⁶

Medical factors known to increase the risk of PTL include persistent vaginal bleeding during pregnancy and systemic infections. Other rare causes include placental abruption and polyhydramnios. Cervical incontinence is also a rare cause of preterm labor. About 30% of preterm births are iatrogenic.⁷

Evidence of various trials suggests that iron treatment of anemic women increases mean duration of gestation and improved APGAR scores.⁸

A study was performed to determine the relationship of frequency and severity of iron deficiency anemia to preterm labor and eventual perinatal outcome in anemic patients.

MATERIAL AND METHODS

A case control study was conducted on 200 Patients (100 cases and 100 controls) with age range 20-35 years, at obstetrics and gynecology Unit-III, Sir Ganga Ram Hospital, Lahore from July 2012 to June 2013. Cases were patients admitted in labor room with preterm labor. The patients with iatrogenic preterm labor, cervical incompetence, APH, multiple pregnancy, polyhydraminos and urinary tract or vaginal infection were excluded.

On admission detailed history was taken. Data was collected regarding age, parity, past obstetrical history, socioeconomic status, history of infection or cervical incompetence and duration of gestation. Patient's symptoms and signs regarding anemia and preterm labor were studied. Venous blood was taken from 200 women in sodium EDTA and was analyzed by semi-automated sysmex hematology analyzer. Peripheral blood smear was studied. Serum ferritin was performed. After delivery birth weight of baby was recorded.

This data was collected on proforma. The analysis was computer based using SPSS version 18. The frequency of anemia amongst cases and controls was studied. Odds ratio was calculated to draw inferences.

RESULTS

A total of 40 patients were isolated from the controls coming with labor at term. In this group 60 patients had normal findings. The mean hemoglobin in this group was 10.3gm/dl with SD of 1.63. The minimum and maximum hemoglobin values for this group were 6 and 13gm/dl respectively.

On the other hand fifty cases of anemia were isolated in cases with preterm labor. In this group, 50

patients had normal findings. The mean hemoglobin in this group was 9.83 gm/dl. The maximum and minimum hemoglobin values for this group were 12.5 and 6 gm/dl respectively). (Table-I-VI)

S. No	Hemoglobin Level (gm/dl)	No. of Cases	Percentage
1.	8	14	14
2.	8.9	16	16
3.	9.1-10	28	28
4.	10.1-11	26	26
5.	11	16	16
Mean	9.83±1.55 gm/dl	100	

Table-I. Hemoglobin distribution in patients with preterm labor.

S. No	Hemoglobin Level (gm/dl)	No. of Cases	Percentage
1.	8	10	10
2.	8-9	10	10
3.	9.1-10	14	14
4.	10.1-11	32	30
5.	11	34	34
Mean	10.30± 1.63	100	

Table-II. Hemoglobin distribution in patients with normal labor.

S. No	Serum ferritin level (1.1g/l)	No. of cases	Percentage
1.	10	42	42
2.	10	58	58

Table-III. Association between Serum Ferritin Level and Preterm Labor

S. No	Weight of baby (kg)	No. of babies (n=100)	Percentage
1.	2	32	32
2.	2-2.5	52	52
3.	2.5	16	16

Table-IV. Birth Weight of the Babies in Patients with Preterm Labor

The odds ratio was calculated. It was seen that among the patients studied a patient with preterm labor was 3.4 times more likely to have been exposed to deficiency anemia than was a patient

S. No	No. of patient	Birth weight (kg)	Alive	%age	Dead	%age
1.	32.	2	6	18.7	26	81.3
2.	52	2-2.5	42	80	10	20
3.	16	2.5	16	100	-	-
Total	100		64		36	

Table-V. Birth Weight and Perinatal Outcome in Patients with Preterm Labor

S. No	Hemoglobin level (gm./dl)	No. of cases	Alive	%age	Dead	%age
1.	8	14	04	28	10	72
2.	8-9	16	12	75	04	25
3.	9.1-10	28	20	71	08	29
4.	10.1-11	26	14	53	12	47
5.	11	16	14	87	02	13
Total		100	64		36	

Table-VI. Association of Hemoglobin Level with Perinatal Outcome in Patients with Preterm Labor

with normal labor.

Statistically there was significant difference ($P < 0.05$) in the frequency of anemia between the cases (preterm labor) and the controls (normal labor).

DISCUSSION

In this research 32% of the patients with preterm labor had iron deficiency anemia. This result is comparable with studies in the industrialized countries. These studies have shown that moderate to severe anemia (9 to 10gm/dl) has been associated with a 2-3 fold increased risk of preterm labor.⁹

In another work performed in Germany by Goepel et al, it was seen that preterm labor was recorded in 48% pregnant women with serum ferritin levels below 10 micrograms/liter. In our study about 58% patients had serum ferritin below 10 micrograms/liter. These studies did not exclude pregnant women with infectious diseases who have increased serum ferritin levels because in those patients its significance is lost as an indicator of iron stores.¹⁰

A study has shown a high incidence of preterm labor in lower socio-economic group. Similarly in our research 56% of the patients belong to lower class and 44% to middle class.¹¹

In a data from UK by Steer et al, in 1995 lowest rate of preterm birth occurred at maternal hemoglobin concentrations of 9.6-10gm/dl. In our study, 20% of the preterm births occurred in patients having hemoglobin between 9.6-10.5gm/dl.¹²

In our research, hemoglobin below the cut-off point, i.e. 10gm/dl is associated with preterm labor whereas many studies carried out by Rasmussen report a U-shaped association between the hemoglobin and the duration of gestation, i.e., there is increased risk of preterm labor at extremes of hemoglobin values.⁸

Another study carried out by Scanlon in 2000 reports the minimum risk of preterm birth if the maternal hemoglobin is more than 11gm/dl. In our study 16% of the patients had preterm labor whose hemoglobin was more than 11gm/dl.¹³

When the association of hemoglobin with perinatal mortality was studied, it was seen that perinatal mortality rate was minimal at maternal hemoglobin values of 10.4-13.2gm/dl in data collected by Murphy et al from Cardiff Birth Survey. The perinatal mortality rate was between hemoglobin 10.4-13.2gm/dl.¹⁴

One of risk factors identified for preterm labor by epidemiological studies include poor antenatal care. In our research 64% of the patients present-

ing with preterm labor did not receive any antenatal care.

Iron supplementation appears to be a good way to prevent iron deficiency for pregnant women because a large proportion of women have difficulty in maintaining iron stores during pregnancy and are at risk for anemia. Moreover, iron supplementation during the pregnancy is not associated with important health risks.

In our study 42% of the patients were prim gravida and 58% were multigravida. In studies carried out in France, UK, USA grand multiparity and null parity, both were associated with increased incidence of preterm labor.¹⁵

In a study carried out on 136 patients of preterm labor in obstetrics and gynecology Unit-2, DHQ hospital Faisalabad, (23) 33.8% of the babies had weight 2kg, 57.3% between 2 to 2.5kg and 8.8 babies had birth weight 2.5kg. In our study 32% of the babies had weight 2kg, 52% between 2 to 2.5kg and 16% of the babies had birth weight 2.5kg.

In this study there were 43% of the females were between 20 and 32% above 30 years of age. In our study 44% of the women were between 20 to 25 years and 32% above 30 years of age.

CONCLUSIONS

Iron deficiency anemia was associated with increased risk for low birth weight, preterm delivery, and perinatal mortality. The frequency of iron-deficiency anemia was seen in both groups of pregnant women.

Study outcome. The research gave us the information about the importance of iron deficiency anemia as a risk factor for preterm labor. It will help the clinicians in selecting the patients with anemia and rendering them to appropriate investigations and treatment. This approach will help in reducing complications like prematurity and the morbidity and mortality associated with preterm labor.

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“Don't be afraid to give up the good to go for the great.”

John D. Rockefeller



AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Tayyaba Majeed	Principal researcher and collected the data	
2	Rabia Adnan	Designed the research protocol	
3	Zahid Mahmood	Helped in designing the reserch protocol	
4	Ishrat Majeed	Co-author	
5	Kanwal Saba	Did the statistical analysis	
6	Hamis Mahmood	Gave the computer help	
7	Sardar Fakhar Imam	Helped is writing and finalizing the manuscript	
8	M. Al Fareed Zafar	Helped is writing and finalizing the manuscript	
9	Mulazim Hussain Bukhari	Supervised the reserach	