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Original Research Article.

Prevalence of Iron Deficiency Anemia in Pregnancy and It's Effect on Maternal and Foetal Outcome

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ABSTRACT

Background: Iron deficiency anemia is typically caused by inadequate intake of iron, chronic blood loss, or a combination of both. The present study was conducted to assess the prevalence of iron deficiency anemia in pregnancy and its maternal outcome.

Materials & Methods: The present study was conducted on 120 pregnant women reported to antenatal clinic. Hemoglobin levels were performed at the first visit and in the third trimester between 34-36 weeks by using Sahli's hemoglobinometer. Fetal growth index (FGR) was derived which is defined as ratio of the observed birth weight to the mean birth weight for that gestational age.

Results: Patients were in primigravida (40), 2nd gravida (42), 3rd gravid (30) and grandmultipara. The difference was significant (P- 0.01). At first visit hemoglobin level was <7 (5), 7-9 gram% (30), 9-11 gram % (44), 11-13 gram % (34) and >13 gram % (7). At 34-36 weeks, it was <7 (10), 7-9 gram% (35), 9-11 gram % (45), 11-13 gram % (23) and >13 gram % (7). The difference was non significant (P> 0.05). There was no correlation in early and late hemoglobin level in pregnancy and FGI as r value noted was more than 0.05.

Conclusion: The best outcomes of pregnancy were observed in women who had normal hemoglobin concentrations at the onset of pregnancy and who became anemic at term, presumably due to physiologic hemodilution.

Key words: Iron, Pregnancy, Fetal Growth Index.

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INTRODUCTION

Anemia is defined by a decrease in the total amount of hemoglobin or the number of red blood cells. Iron deficiency anemia is a form of anemia due to the lack of sufficient iron to form normal red blood cells.[1]

The World Health Organization (WHO) defined anemia in pregnancy as hemoglobin values <11 g/dl5, and Centre for Disease Control (CDC) as a hemoglobin level <11 g/dl during the first and third trimesters and < 10.5 g/dl during second trimester. When maternal anemia is diagnosed before mid-pregnancy, it has been associated with an increased risk of preterm delivery. Maternal anemia detected during the later stages of pregnancy, especially the third trimester, often reflects the expected and necessary expansion of maternal plasma volume. Third trimester anemia usually is not associated with the increase in preterm delivery.[2] Iron deficiency anemia is typically caused by inadequate intake of iron, chronic blood loss, or a combination of both. It is the most common cause of anemia in the world. Patients with anemia present similar clinical symptoms such as fatigue, breathlessness, dizziness, and headache. Anemia also increases the susceptibility to different kinds of infections and impairs the work capacity. Severity of symptom caused by anemia is paralleled with the severity of anemia. Severe anemia may predispose to infection and heart failure, while severe anemia during pregnancy may significantly contribute to both maternal mortality and morbidity.[3]

Iron deficiency results in anemia, impaired neurobehavioral performance, and decreased physical work capacity. In iron deficiency there are no mobilizable iron stores and in which signs of a compromised supply of iron to the tissues including the erythron are noted. The more severe stage of iron deficiency is associated with anemia.[4] The present study was conducted to assess the prevalence of iron deficiency anemia in pregnancy and its maternal outcome.

MATERIALS & METHODS

We planned the present study in the Department of Obstetrics & Gynaecology of National Institute of Medical Science and Research, Jaipur, Rajasthan, India. The present study was conducted on 120 pregnant women reported to antenatal clinic. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained before the start of study. General information such as name, age, gender etc. was recorded in case history performa. Hemoglobin levels were performed at the first visit and in the third trimester between 34-36 weeks by using Sahli's hemoglobinometer. Iron supplementation was continued in all patients. Fetal growth index (FGR) was derived which is defined as ratio of the observed birth weight to the mean birth weight for that gestational age. They were classified as normal growth if the ratio was between 0.9 - 1.10, mild growth restriction if between 0.8-0.85, moderate if between 0.75 -0.8 and severe if <0.75.Results were tabulated and subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

Table I: Distribution of patients

Pregnancy	Number	P value
Primigravida	40	
2nd gravida	42	0.01
3rd gravida	30	
Grandmultipara	8	

Graph I: Hemoglobin level in patients

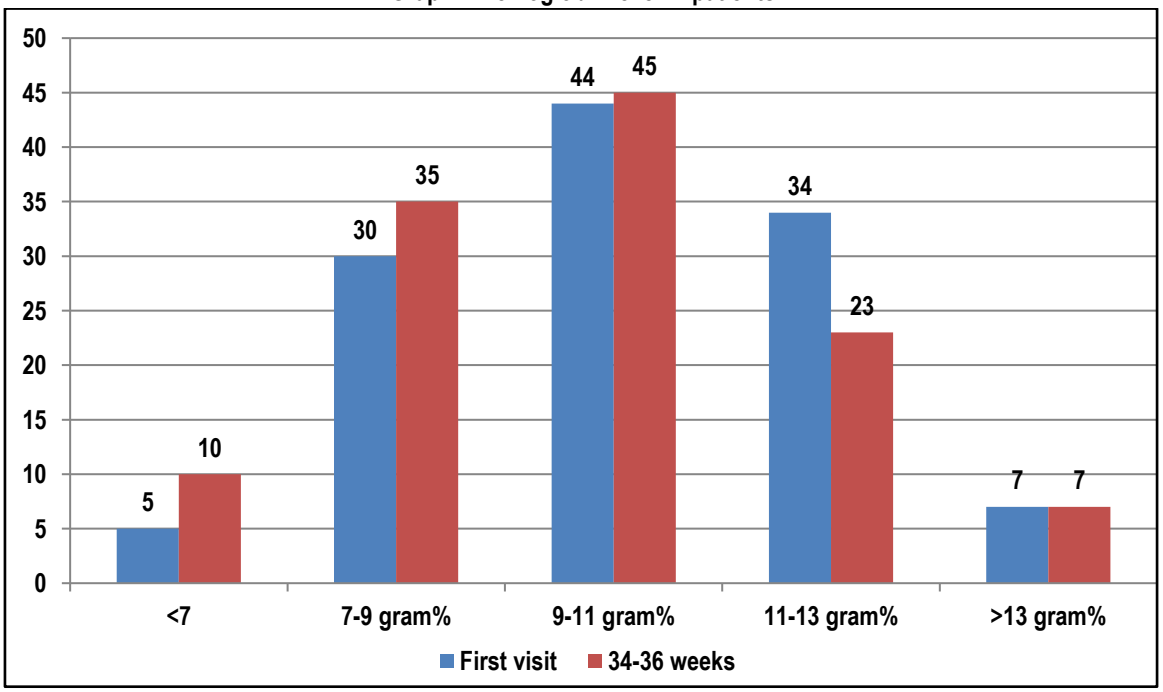

Table II: Correlation between early and late hemoglobin level in pregnancy and FGI

Hb (g/dl)	Early cases	FGI mean± S.D	R value	Early cases	FGI mean± S.D	R value
<7	5	0.92±0.18	0.21	10	0.93±0.19	0.18
7-9	30	0.91±0.19		35	0.92±0.20	
9-11	44	1.004±0.11		45	1.005±0.12	
11-13	34	0.94±0.27		23	0.92±0.31	
>13	7	0.95±0.20		7	0.92±0.22	

RESULTS

Table I shows that patients were in primigravida (40), 2nd gravida (42), 3rd gravid (30) and grand multipara. The difference was significant (P- 0.01). Graph I shows that at first visit hemoglobin level was <7 (5), 7-9 gram% (30), 9-11 gram % (44), 11-13 gram % (34) and >13 gram % (7). At 34-36 weeks, it was <7 (10), 7-9 gram% (35), 9-11 gram % (45), 11-13 gram % (23) and >13 gram % (7). The difference was non-significant (P> 0.05).

DISCUSSION

Anemia is defined as a decrease in the number of red blood cells or the amount of hemoglobin in the blood. When onset is slow, symptoms are often vague, including feeling tired, weakness, shortness of breath, or poor ability to exercise.[5] Anemia that comes on quickly often has greater symptoms, including: confusion, feeling like one is going to pass out, and increased thirst. There needs to be significant anemia before a person

becomes noticeably pale. Because anemia is most common indicator to screen iron deficiency the terms anemia and iron deficiency anemia are sometimes used interchangeably. It affects 43% of preschool children all over the world, especially in developing countries, which present prevalence rates four times higher than those found in industrialized countries.[6]

In present study, patients were in primigravida (40), 2nd gravida (42), 3rd gravid (30) and grandmultipara. This is similar to Lindsay et al.[7] Sharma et al[8] in their study found that increased weight gain in pregnancy was associated with increase in mean birth weight r=0.23 (P value 0.672). Increase in the hemoglobin concentration was associated with increase in birth weight r=0.36 (P value 0.49). It was observed that high hemoglobin concentration in pregnancy was associated with more length of gestation but it was not significant r=0.31 (P value 0.50).

Iron deficiency anemia was associated with a greater risk of LBW in early but not late pregnancy. Results from a study in India also suggested a negative effect of anemia during pregnancy on different anthropometric measurements at birth.15 Contrary to these results, two studies in different populations (United States and United Kingdom) did not find a relationship between iron status markers (hemoglobin or mean corpuscular volume [MCV]) at different stages of pregnancy and fetal growth outcomes.[9]

We found that first visit hemoglobin level was <7 (5), 7-9 gram% (30), 9-11 gram % (44), 11-13 gram % (34) and >13 gram % (7). At 34-36 weeks, it was <7 (10), 7-9 gram% (35), 9-11 gram % (45), 11-13 gram % (23) and >13 gram % (7). This is in agreement with Sidhu et al.[10]

Iron-deficiency anemia is characterized by the sign of pallor and the symptoms of fatigue, lightheadedness, and weakness. None of these symptoms are sensitive or specific. Pallor of mucous membranes in children suggests anemia with the best correlation to the disease, but in a large study was found to be only 28% sensitive and 87% specific in distinguishing children with anemia, hemoglobin and 49% sensitive and 79% specific in distinguishing severe anemia. Thus, this sign is reasonably predictive when present, but not helpful when absent, as only one-third to one-half of children who are anemic will show pallor.[11] Sukrat B et al determined the prevalence of iron deficiency anemia in pregnant women and the prevalence of thalassemia in both the anemic and non-anemic group. At the first antenatal visit, blood was obtained for complete blood count. If hemoglobin < 11 g/dl or hematocrit < 33%, serum ferritin was performed. The authors used definition of anemia from CDC and WHO to determine the prevalence of anemia in pregnant women. Iron deficiency anemia was defined by anemia from CDC or WHO criteria in accordance with serum ferritin less than 30 mg/L. Cases of abnormal thalassemia screening were followed by hemoglobin electrophoresis and polymerase chain reaction (PCR) for diagnosis of alpha thalassemia 1 (SEA and Thai-deletion type). The data was analyzed by descriptive fashion and presented as mean, percentage, and standard deviation. Five hundred nineteen pregnant women were recruited. The prevalence of anemia from WHO (Hemoglobin < 11 g/ dl), WHO (Hematocrit < 33%), and CDC criteria were 14.1, 9.8, and 10.6% respectively. The prevalence of iron deficiency anemia was 6.0, 4.6, and 4.8% in the same order. The prevalence of thalassemia was 39.7% in the anemic group and 24.4% in the non-anemic group. The WHO criteria (Hemoglobin < 11 g/dl) gave the highest prevalence of anemia and iron deficiency anemia during pregnancy (14.1% and 6.0%). The prevalence of thalassemia in the anemic group (39.7%) was higher than non-anemic group (24.4%).[12]

CONCLUSION

The best outcomes of pregnancy were observed in women who had normal hemoglobin concentrations at the onset of pregnancy and who became anemic at term, presumably due to physiologic hemodilution.

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