Original article:

A Cross Sectional Study of the Relationship between the Iron Profile of Pregnant Women and Their New Borns

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ABSTRACT:

Background: The burden of disease is heavy yet poorly estimated. Knowledge of the current situation in our environment is necessary. This knowledge will enhance early detection and timely management of anemia in pregnancy. The objective of the present study was to determine the relationship between the iron status of pregnant women and their newborns using a combination of several hematological and biochemical parameters for the diagnosis of iron deficiency.

Material & Methods: A hospital based descriptive type of observational study done on 100 pregnant women in the department of obstetrics & gynecology in Government Medical College, Pali, Rajasthan. General physical examination was done meticulously to assess maternal conditions regarding anemia such as nutritional status, pallor, edema and glossitis. Systemic examination was done for respiratory and cardiovascular system. Obstetrical examination was done for fundal height and estimation of gestational age.

Results: Out of the total 100 patients included into the study, 48 patients (48%) had a haemoglobin count of less than 10gm%. Most of the anemic patients had moderate anemia followed by women with mild anemia. The most common age group affected was 20-30 years, which was the predominant age group of pregnant patients who had come to our hospital.

The most common fetal complication was low birth weight in the fetus, 58.33% in mild, 55.88% in moderate and 50% in the severe cases. The other complications observed were birth asphyxia, still birth and neonatal deaths.

Conclusion: Microcytic anemia most likely due to iron deficiency was the most prevalent type. Routine iron supplementation should be encouraged early in pregnancy and educating women on early initiation of antenatal clinic attendance would reduce the problem of anemia in pregnancy.

Key Words: Iron Deficiency Anemia, Fetal Outcome, Pregnancy, Hemoglobin.

INTRODUCTION

Anemia has been a topical issue in many developing countries because of its association with adverse pregnancy outcome such as increased rates of maternal and perinatal mortality, premature delivery, low birth weight, low APGAR scores, fetal physical growth and mental impairment and infant deaths etc.[1,2] Anemia may worsen the sequelae of postpartum hemorrhage and predispose to puerperal infection both of which are leading causes of maternal mortality in developing countries.[1]

Iron deficiency anemia is the most frequent nutritional deficiency in pregnancy, with an impact on maternal and fetal morbidity and mortality. It is regarded as the most important preventable cause of perinatal complications, such as premature delivery, intrauterine growth retardation and neonatal and perinatal death.[3]

It is still not clear whether iron deficiency in pregnant women might lead to a deficient iron status of their children. Many studies have supported the belief that iron transport from the mother to their fetus occurs independently of maternal iron levels, and that it might even induce deficiency in the mother as a result of fetal "parasitism". However, later studies have questioned this belief and suggested that maternal iron deficiency can cause depletion of fetal iron stores. No consensus regarding this subject has been reached thus far.[4,5]

It is one of the most prevalent nutritional deficiencies in the world, and more than half of the population in India is anemic. It is estimated by WHO that around 14% of the developed countries and 51% of the developing countries are affected with this condition. In India, around 65-75% are said to be affected. Ministry of Health and Family Welfare stated that iron deficiency anemia is a serious public health problem that affects the ability to study and work as well as health and well-being.[6]

Hemoglobin concentration is the most used parameter to detect anemia in public health care services due to its low cost and available reference standards. Therefore, a combination of several parameters has been proposed in order to improve the diagnosis of iron deficiency.

The objective of the present study was to determine the relationship between the iron status of pregnant women and their newborns using a combination of several hematological and biochemical parameters for the diagnosis of iron deficiency.

MATERIALS & Methods

A hospital based descriptive type of observational study done on 100 pregnant women in the department of obstetrics & gynecology in Government Medical College, Pali, Rajasthan.

Inclusion Criteria

- All singleton primi pregnant women at term gestation (37-42 weeks) admitted to labour room.
- All women who give consent to be a part of study

Exclusion Criteria

- Women with systemic disease hypertension, diabetes mellitus, heart disease, other chronic medical diseases.
- Women with congenitally malformed fetus or IUFD.

METHOD

Detailed histories were obtained regarding name, husband name, age, registration number and address. History of presenting complaints, menstrual history, period of amenorrhoea, obstetric history, past history, medical history and personal history especially diet were obtained.

General physical examination was done meticulously to assess maternal conditions regarding anemia such as nutritional status, pallor, edema and glossitis. Systemic examination was done for respiratory and cardiovascular system.

Obstetrical examination was done for fundal height and estimation of gestational age.

Investigations

Venous sample of the mother were taken in 2 vials- one in EDTA and the other in plain for CBC and serum haematological parameters respectively. Similarly cord blood was taken in 2 vials for above mentioned investigations. Routine antenatal investigations were done i.e. Urine complete & microscopic, ABORh, FBS, VDRL, HBsAg and HIV.

RESULTS

Out of the total 100 patients included into the study, 48 patients (48%) had a haemoglobin count of less than 10gm% (Figure 1).

Most of the anemic patients had moderate anemia followed by women with mild anemia. The most common age group affected was 20-30 years, which was the predominant age group of pregnant patients who had come to our hospital (Table 1).

The most common fetal complication was low birth weight in the fetus, 58.33% in mild, 55.88% in moderate and 50% in the severe cases. The other complications observed were birth asphyxia, still birth and neonatal deaths (Table 3).

DISCUSSION

Anemia is one of the most common nutritional deficiencies in the world. Inadequate intake or absorption of iron in addition to blood loss may contribute to anemia.

The prevalence of anemia in our study was 48%. In a study by Koura et al, around 40% of the expectant mothers presented with anemia.[7] In another study by Cheema et al, the incidence was higher with 65.6%, as was the case in a study by Singh et al where 65.5% was reported.[8,9] A low prevalence of 27.9% was observed in a study by Kefiyalew et al in Ethiopia.[10]

Among the anemic patients, moderate type was the most common seen in 34 (34%) followed by mild (12%). Severe anemia was seen among 2 (2%) of the anemic patients. In a study by Kefiyalew et al, most of the patients had moderate anemia, while 12.9% had severe anemia.[10]

Most of the patients in this study were between 20-30 years of age, which shows that this is the most common reproductive age in this area who were more anemic. However, in a study by Cheema et al, the age group between 35-49 years were more affected by this condition.[8]

In the present study, the predominant outcome of the fetuses was low birth weight. This was in accordance to a study by Ahmed et al, where the neonates, born to anemic mothers had predominantly low birth weight[11]. However, no association of low birth weight between LBW and anemia in a study by Koura et al.[7]

CONCLUSION

Anaemia is a serious health problem in India where the life of pregnant women and her child are endangered. Iron deficiency anemia is the commonest etiologic type. Late antenatal booking was clearly associated with high prevalence of anemia in pregnancy.

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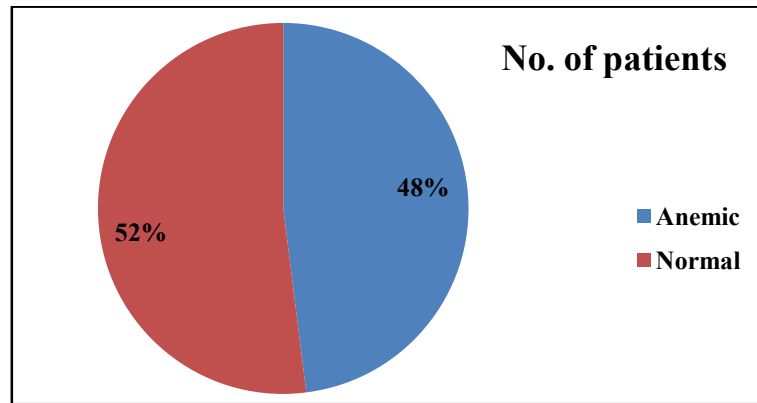
Figure 1: Prevalence of anemia among pregnant women.

Table 1: Age wise distribution of anemic patients.

Age	Normal	Mild	Moderate	Severe	Total
< 20 years	3 (5.76%)	2 (16.66%)	2 (5.88%)	0 (0%)	7 (7%)
20-30 years	32 (61.53%)	8 (66.66%)	22 (64.70%)	2 (100%)	64 (64%)
>30 years	17 (32.69%)	2 (16.66%)	10 (29.41%)	0 (0%)	29 (29%)
Total	52 (100%)	12 (100%)	34 (100%)	2 (100%)	100 (100%)

Table 2: Fetal complications

Fetal factors	Mild (n=12)	Moderate (n=34)	Severe (n=2)
Low birth weight/IUGR	7	19	1
Preterm delivery	3	9	1
Birth asphyxia/sepsis	2	3	0
IUD/ Stillbirth	0	2	0
Neonatal death	0	1	0