

Effect of severity of maternal anaemia on fetal outcome

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Abstract

Anemia is one of the major public health problems in the developing world¹. More than 70% of pregnant women in developing countries suffer from anemia². It has a great impact on health, physical and neuro- psychological development, which further influence development of the nation. The magnitude of this problem is greater in under-developed and developing nations which includes India. In spite of several measures on the part of government and health sector, it has been a tough task to combat anemia in pregnant women. The present study focuses on effect of anemia of varying severity on fetal outcome.

Key Words: IDA (Iron Deficiency Anemia).

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INTRODUCTION

Anemia is one of the major public health problems in the developing world¹. More than 70% of pregnant women in developing countries suffer from anemia². It has a great impact on health, physical and neuro- psychological development, which further influence development of the nation. The magnitude of this problem is greater in under-developed and developing nations which includes India. In spite of several measures on the part of government and health sector, it has been a tough task to combat anemia in pregnant women. In India the prevalence of anemia among pregnant women is 57%³. Iron deficiency anemia contributes to more than 90% cases of anemia complicating pregnancy being responsible for 19% of maternal deaths⁴. Since iron deficiency anemia is the

predominant form of anemia among pregnant women in developing nations, the present study focuses on the effects of iron deficiency anemia on the fetus. The frequency of iron deficiency anemia among pregnant women depends on the iron stores with which the women enter pregnancy which further depend on her childhood and adolescent nutritional status. The government of India has initiated measures targeted at pregnant and lactating women, infants aged 6 to 12 months, adolescent girls and school going girls by providing iron supplementation and fortification of foods with iron depending on prevalence of IDA in that particular region. Especially during pregnancy government of India provides universal with 100mg of elemental iron and 0.5mg of folic acid daily from second trimester till 100 days postpartum under the national nutritional anaemia control programme 1970. Iron deficiency anemia has a great impact on maternal and fetal outcome. It is thought to have an impact on genes modulating fatty acid metabolism in the placenta which has impact on the fetus. Maternal anemia is associated with increased incidence of toxemia, hydramnios, APH, preterm labour, PPH in the mother and prematurity, low birth weight and anemia in the newborn. Hence the present study emphasizes the importance of severity of maternal iron deficiency anemia on foetal outcome. Anemia is defined as circulating hemoglobin concentration of less than 12gm/dl among

non-pregnant women and less than 11gm/dl among pregnant women. It is the commonest type of anemia during pregnancy. During pregnancy the red cell mass increases by 30% while the plasma volume increases by 40 to 50% resulting in a decreased hemoglobin concentration by 2gm/dl approximately⁶. This is termed physiological anemia of pregnancy. The CDC 1998 defined anemia in iron supplemented pregnant women using a cutoff of 5th percentile as 11g/dl in the first and third trimester and 10.5gm/dl in the second trimester⁵. The WHO defines anemia as a condition in which the hemoglobin content is lower than normal as a result of deficiency of essential nutrients regardless of the cause of such deficiency.

Grading of Anemia: Various grading systems have been employed to classify the severity of anemia in pregnancy. According to WHO it is graded as following. Mild - 9 to 11gm/dl Moderate - 7 to 8.9gm/dl Severe - less than 7gm/dl

Effects of Anemia on Mother: Anemia is a major contributor to maternal mortality in developing countries. In India it is responsible for 19% of maternal deaths, an important cause for death being congestive cardiac failure. It contributes to significant morbidity even. It aggravates obstetrical complications like pre-eclampsia, antepartum haemorrhage, medical complications like cardiac disease and there is increased susceptibility to infections. Increased incidence of toxemia, hydramnios, APH, preterm labour, PROM, PPH contributing to increased maternal morbidity and mortality^{7,8}. During labour, there is increased incidence of uterine inertia, maternal exhaustion and postpartum haemorrhage. During puerperium, there is increased incidence of sepsis, sub involution of uterus, lactation failure, delayed wound healing and thromboembolic complications.

Effects of Anemia on Foetus: Maternal anemia adversely affects the fetal outcome. There is 2 to 4 fold increase in prematurity^{12,13}, 3 fold increased risk of low birth weight, IUGR and 6 fold increased risk of anemia. Henceforth all the associated complications of prematurity and low birth weight like hypoglycemia, hypothermia, RDS, hyperviscosity, electrolyte abnormalities, necrotizing enterocolitis, intraventricular haemorrhage follow there by increasing the perinatal morbidity and mortality.

Prevention: WHO recommends 60mg of iron along with 400 micrograms of folic acid for 6 months where prevalence of IDA is less than 40% and for 3 more months in the postpartum period where prevalence is more than 40%. The NNACP in India recommends 100mg of elemental iron along with 500 micrograms of folic acid to be taken for a minimum of 100 days starting from second trimester which is to be continued for

minimum of 100 days in the postpartum period^{10,11}. The beneficiaries under this programme also include lactating mothers and children under 12 years of age. Adolescents are also included under the national programme. Apart from these, measures like health education, food fortification, dietary supplementation act as add back measures in preventing IDA.

MATERIALS AND METHODS

Inclusion Criteria

1. Pregnant women at term gestation with singleton pregnancy irrespective of parity.
2. Age group 18 to 32 years.

Exclusion Criteria

1. Anaemia due to causes other than IDA.
2. Associated medical disorders.
3. Associated obstetrical complications like preeclampsia, multiple gestation, antepartum haemorrhage.
4. HIV, Hbsag, HCV reactive mothers.

Method of Study

Study design: Prospective study

Study period: August 2012 to July 2014

Study area: Department of Obstetrics and Gynaecology, Gandhi Hospital

Study Sample: 40

OBSERVATION AND RESULTS

Table 1: Showing comparison of primigravidae versus multigravidae

	Control	Mild	Moderate	Severe	Total
Primigravidae	4	3	2	3	12
Multigravidae	6	7	8	7	28

In the present study, multigravidae represent 70% of the total study population.

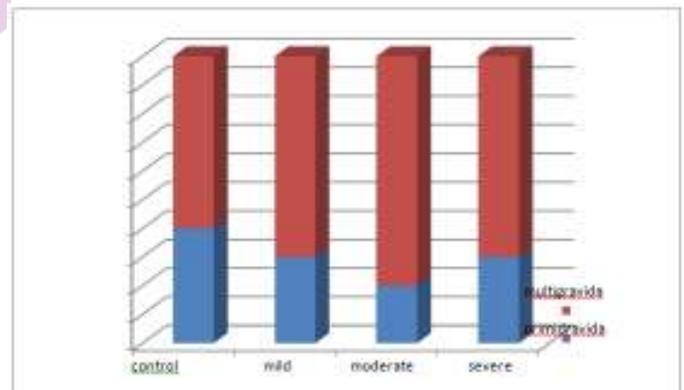


Figure 1:

Chart showing gravidity wise distribution In the control group, multigravidae represent 60% of the controls while in the anemic study population they represent 73.3% of the anemic group.

Table 2: Showing age wise distribution of study population

	Control	Mild	Moderate	Severe	Total
18-22	5	4	5	3	17
23-27	5	6	4	3	18
28-32	0	0	1	4	5

In the present study, 45% belong to 23-27 years age group.

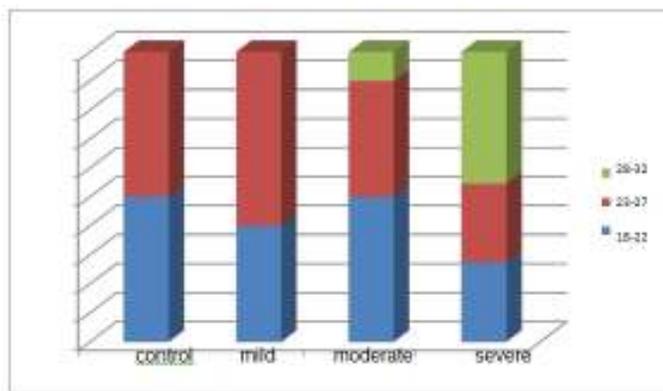


Figure 2:

Chart showing age-wise distribution In the present study, 50% of the control population belong to 23-27 yrs age group and the rest 50% to 18-22yrs age group. In the anemic group, 43.3% belong to 23-27 yrs age group, 40% belong to 18-22yrs age group and the rest 6.7% to 28-32yrs age group.

Table 3: Showing birth weight categorization

	Control	Mild	Moderate	Severe	Total
<1.5 kg				1	1
1.5-2kg				9	21
2.1-2.5kg	4	3	5		14
2.6-3kg	5	5	4		14
>3kg	1	2	1		4

In the present study, 52.5% newborns were in the birthweight range of 2.1- 2.5kgs.

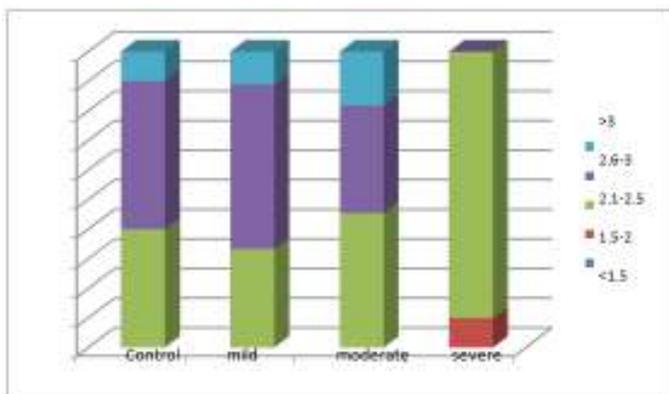


Figure 3:

Chart showing birth weight distribution In the control group, 50% of the new born birth weights were in the range of 2.6-3kg. In the anemic group, 56.6% of the

newborns were in the birth weight range of 2.1-2.5kg and 30% were in the range of 2.6-3kg and 10% were >3kgs

Table 4: Showing mode of delivery in the study population

	Control	Mild	Moderate	Severe	Total
LSCS	6	7	4	2	19
VAGINAL DELIVERY	4	3	6	8	21

In the present study, mode of delivery was NVD in 52.5% of the study population.

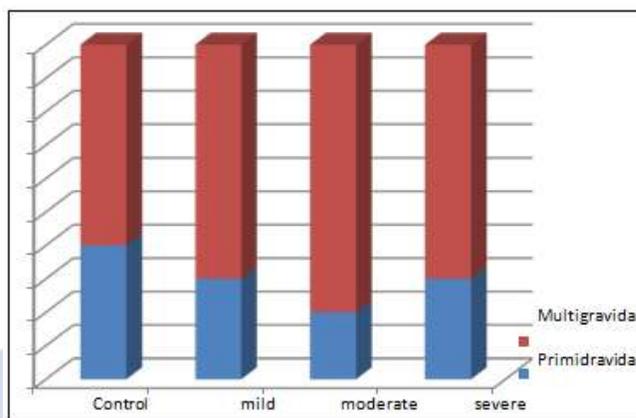


Figure 4:

Chart showing mode of delivery distribution In the control population 60% population had LSCS as the mode of delivery. In the study population, 56.6% delivered vaginally while 43.3% underwent LSCS.

CONCLUSION

From the present study, it is inferred that there exists a significant association between maternal anemia and low birth weight. The correlation is found to be significant in the severe anemia group, which means that maternal anemia has significant impact on the newborn birth weight when maternal hemoglobin levels falls below 7 gm/dl. Severe maternal anemia has a significant association with length of the newborn, while it doesn't affect the length of the new born in mild and moderate anemia groups. Maternal anemia has an impact on birth weight and length of the new born only when it falls into severe anemia group, where the hemoglobin falls below 7gm/dl. In conclusion, mild and moderate maternal anemia does not affect birth weight and length of the newborn. Severe maternal anemia has a great impact on birth weight. Hence, inference from present study is to detect maternal anemia at the earliest in a less severe form so that deleterious effects on the fetus in case of severe anemia can be prevented.

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