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EFFECT OF MATERNAL ANEMIA ON FETAL OUTCOME

Dr Mukesh Lekhala[1], Dr Rekha Acharya[2]

[1]Assistant Professor, Department of Preventive and Social Medicine, Saradar Patel Medical College, Bikaner
[2]Senior Professor, Department of Preventive and Social Medicine, Saradar Patel Medical College, Bikaner

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Corresponding author: Mukesh Lekhala
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Abstract

Background: Anemia in pregnancy is a worldwide problem, but it is most prevalent in the developing world.

Methods: A cross-sectional study was conducted at maternity wards of P B M hospital, attached to S P Medical College, Bikaner. The study was conducted for a period of 2 months. Women aged 15-49 yrs. Who had undergone delivery and having ANC record were include in the study after taking informed consent for participation in the study. The data were collected using semi-structured questionnaire.

Results: A significant association was found between maternal anemia in third trimester and adverse neonatal outcome.

Conclusion: Maternal anemia was highly prevalent in this population. Lower birth weight, and incresed risk of small-for-gestation were associated with maternal anemia. Maternal anemia needs urgent attention to improve neonatal outcome in this population.

Keywords: ANC; Hemoglobin Status; LBW

Introduction

Anemia is a condition in which red blood cells or their oxygen carrying capacity is insufficient to meet physiologic needs, which may vary according to age, sex, and pregnancy status. In pregnancy, if hemoglobin level is less than 11 gm/dl in the first and third trimester, or less than 10.5 gm/dl in second trimester, the pregnant women considered anemic.[1-3]

World Health Organization reported that 18% of women from industrialized countries, and 35% to 75% (56% on average) of pregnant women in developing countries, are anemic. Anemia is one of the most common medical disorders during pregnancy. It can cause serious adverse effects on the mother and the fetus with high risk for maternal mortality.[4] The association of maternal anemia with pre-eclampsia and eclampsia as well as intrauterine growth restriction (IUGR), low birth weight, and increased risk of postpartum hemorrhage (PPH), has been proposed. Prematurity, low Apgar score and intrauterine fetal death are more common in anemic pregnant women compared to non anemic. Mild anemia usually has no effect on pregnancy except that the mother may become anemic in subsequent pregnancies due to low iron stores; on the other hand severe anemia is associated with poor outcome as tachycardia, dyspnea and high cardiac output failure which may be fatal. During pregnancy, iron requirements increases thus exacerbating the prevalence of anaemia, also there is a disproportionate increase in plasma volume more than red cell mass resulting in a physiological drop in hemoglobin level (Hb) in the mid trimester.[6]

Materials and Methods

A cross-sectional study was conducted at maternity wards of P B M hospital, attached to S P Medical College, Bikaner. The study was conducted for a period of 2 months. Women aged 15-49 yrs. Who had undergone delivery and having ANC record were include in the study after taking informed consent for participation in the study. The data were collected using semi-structured questionnaire. The questionnaire consisted of data regarding sociodemographic data, antenatal visits, and weight gain during pregnancy and hemoglobin status. Sociodemographic details were collected by interviewing the mothers and other details including hemoglobin status were collected from the records.

Data analysis- The data were analyzed for frequencies and Chi-square test was applied for the determination of association between variables and hemoglobin status using Statistical Package for the Social Sciences 22.0 version. For determination of association, $P < 0.05$ was considered statistically significant.

Results

Table 1: Association between maternal anemia in third trimester and low birth weight of babies

Maternal anemia status	Birth weight		p-value
	<2.5 Kg	≥2.5 Kg	
Anemia	353(35.5%)	642(64.5%)	0.01
Non anemic	14(14.7%)	81(85.3%)	
Total	367(33.7%)	723(66.3%)	

A significant association was found between maternal anemia in third trimester and low birth weight of babies

Table 2: Association between maternal anemia in third trimester and premature birth

Maternal anemia status	Premature birth		p-value
	Yes	No	
Anemia	183(18.4%)	812(81.6%)	0.01
Non anemic	14(14.7%)	81(85.3%)	
Total	197(18.00%)	893(82.00%)	

A significant association was found between maternal anemia in third trimester and premature birth

Table 2: Association between maternal anemia in third trimester and still birth

Maternal anemia status	Still birth		p-value
	Yes	No	
Anemia	49(5.00%)	946(95.00%)	0.01
Non anemic	7(7.4%)	88(92.6%)	
Total	56(5.1%)	1034(94.9%)	

A significant association was found between maternal anemia in third trimester and still birth

Discussion

Our data show that maternal anemia has negative effects on neonatal outcomes. Gestational length progressively decreased with worsening severity of maternal anemia. The shorter gestational length also appears to mediate the observed association between Hb and LBW. However, unlike previous studies, there was a strong association between Hb and birth weight that was independent of gestational length at lower maternal Hb levels. Surprisingly, unlike mild and severe anemia, moderate anemia did not influence birth weight and other growth parameters. One possibility is that most mothers in the moderate anemia group had Hb >81 g/L, which may have skewed the results. Previous studies analyses confirm 80 g/L as the threshold below which low Hb levels have the greatest influence on birth weight. Another possibility is that hemodilution due to plasma expansion was partly responsible for the low Hb in the moderate anemia group. Such plasma expansion is thought to have beneficial effects on placental circulation and fetal growth. Future studies are necessary to confirm our findings and explain the discrepant results. The strongest effect on birth weight independent of gestational age (i.e., SGA) was seen only with severe maternal anemia (Hb).[8-10]

Conclusion

Maternal anemia was highly prevalent in this population. Lower birth weight, and incresed risk of small-for-gestation were associated with maternal anemia. Maternal anemia needs urgent attention to improve neonatal outcome in this population.

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