

Maternal Anemia is a Risk Factor for Low Birth Weight Babies at Term

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ABSTRACT

Background: Anemia is a most wide spread nutritional disorder affecting almost 30% of the population and is even more prevalent in pregnant women. According to World Health Organization (WHO) hemoglobin of less than 11gm/dl at term and hematocrit of less than 0.33 is called anemia.

Aim: To determine the maternal anemia is a risk factor for low birth weight babies at term.

Methods: This case control study was carried out at the Department of Obstetrics & Gynaecology Unit-I, Sir Ganga Ram Hospital, Lahore over a period of 6 months from 1st January 2011 to 30th June 2011. Two hundred cases were included. They were divided into two groups (case group and control group), each group comprise 100 cases. Low birth weight babies, gestational age >37 weeks and singleton pregnancy were included. Women with chronic diseases, intrauterine infections and malformed babies were excluded. Hb was analyzed in laboratory at Sir Ganga Ram Hospital Lahore upon admission just before delivery, women with Hb of <11gm/dl at term are taken as anemic.

Results: The mean age of the patients in cases group was 26.1±3.1 years and in control group was 26.6±3.3 years. The mean gestational age in case group was 38.3±1.2 weeks and in control group was 38.6±1.2 weeks. In the distribution of patients by anemic, in case group, there were 40 (40%) patients anemic and 60 (60%) patients were not anemic. In control group, there were 18 (18%) patients anemic and 82 (82%) patients were not anemic with odd ratio of 3.04 (significant).

Conclusion: The maternal anemia is a risk factor for low birth weight babies at term as compared to control group.

Key words: Maternal anemia, risk factor, low birth weight babies, haemoglobin.

INTRODUCTION

Anemia is a most wide spread nutritional disorder affecting almost 30% of the population and is even more prevalent in pregnant women¹. According to World Health Organization (WHO) hemoglobin of less than 11gm/dl at term and hematocrit of less than 0.33 is called anemia^{2,3}.

Maternal anemia is responsible for adverse pregnancy outcomes.² Pregnancy outcomes vary depending on the severity of anemia.¹ It has significant impact on health of mother as well as the health of baby^{2,4}. It is responsible for preterm labor, low birth weight babies, postpartum hemorrhage due to uterine atony, and wound infections².

Anemia result in decrease hemoglobin and oxygen supply to fetus, placenta and uterus. It also causes tissue enzyme³ dysfunction, cellular dysfunction and placental dysfunction leading to low birth weight^{2,5,6}.

Babies born with birth weight of less than 2.5 kg at term are called low birth weight (LBW) babies.¹ Low birth weight babies are at significant risk of

increased infant mortality and morbidity⁷, resulting in 4 million deaths per year⁸.

In a study conducted at district hospital in Karnataka in 2009 in low birth weight babies 36% were anemic mothers and in normal birth weight babies 15.3% were anemic mothers⁹.

Low birth weight babies have increased risk of respiratory distress (due to delayed clearance of alveolar secretions and surfactant deficiency) hypothermia, hypoglycemia, electrolyte imbalance (hypocalcaemia, hypernatremia, hyperkalemia), anemia, jaundice, neuro-developmental complications, delayed closure of fetal shunts⁹.

Anaemia has a significant impact on the health of mother and fetus especially if the condition is severe, however, the literature is conflicting about the association between anemia and perinatal outcomes. A strong association between low haemoglobin before delivery and adverse outcomes such as preterm delivery, low birth weight, intra uterine growth retardation, small for gestational age and anaemia¹.

The aim of my study is to observe the association between maternal anemia and low birth weight babies and encourage all women to have regular antenatal checkups and diagnosing anemia as early as possible in pregnancy and correcting it to prevent low birth weight babies.

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MATERIAL AND METHODS

This case control study was carried out at the Department of Obstetrics & Gynaecology Unit-I, Sir Ganga Ram Hospital, Lahore over a period of 6 months from 1st January 2011 to 30th June 2011. Two hundred cases were included. They were divided into two groups (case group and control group), each group comprise 100 cases. Low birth weight babies, gestational age >37 weeks and singleton pregnancy were included. Women with chronic diseases, intrauterine infections and malformed babies were excluded. Hb was analyzed in laboratory at Sir Ganga Ram Hospital Lahore upon admission just before delivery, women with Hb of <11gm/dl at term are taken as anemic.

Data Analysis: Data was analyzed by using SPSS version 10 computer based software program for data analysis. Mean and standard deviation was calculated for age of mother. Frequency and percentage were calculated for anemic and non-anemic mothers in both groups.

Odds ratio was calculated for association of risk of maternal anemia with low birth weight. OR <2 was considered as significant.

RESULTS

The mean age of the patients in cases group was 26.1±3.1 years and in control group was 26.6±3.3 years. In case group, there were 37 (37%) patients in the age range of 20-25 years, 56(56%) patients in the age range of 26-30 years and 7 (7%) patients in the age range of 31-35 years. In control group, there were 32(32%) patients in the age range of 20-25 years, 59(59%) patients in the age range of 26-30 years and 9(9%) patients in the age range of 31-35 years (Table 1).

The mean gestational age in case group was 38.3±1.2 weeks and in control group was 38.6±1.2 weeks. In the distribution of patients by anemic, in case group, there were 40(40%) patients anemic and 60(60%) patients were not anemic. In control group, there were 18(18%) patients anemic and 82(82%) patients were not anemic with odd ratio of 3.04 (significant) (Table 2).

In the distribution of patients by low birth weight, in case group there were 100(100%) patients low birth weight and in control group there was no patient had low birth weight (Table 3).

Table 1: Distribution of patients by age

Age (years)	Case Group	Control Group
20-25	37(37%)	32(32%)
26-30	56(56%)	59(59%)
31-35	7(7%)	9(9%)
Mean±SD	26.1±3.1	26.6±3.3

Table 2: Distribution of patients by anemic

Anaemic	Case Group	Control Group
Yes	40(40%)	18(18%)
No	60(60%)	82(82%)

Odd Ratio 3.04 (Significant)

Table 3: Distribution of patients by low birth weight

Low birth weight	Case Group	Control Group
Yes	100(100%)	0
No	0	100(100%)

P value: 0.001

DISCUSSION

In Pakistan it is common to see patients with severe anemia late in pregnancy with no prior antenatal care, especially in low socioeconomic settings. This is evident in our country, where a vast majority of patients were anemic at delivery. Baig-Ansari¹⁰ found that 90.5% pregnant women were anemic in an urban setting in Pakistan.

Jaleel and Khan² demonstrated a causal relationship between severe anemia and various maternal and perinatal complications. The underlying cause is postulated to be iron deficiency. Iron deficiency anemia results in impaired transport of hemoglobin and thus oxygen to uterus, placenta and fetus. It also causes tissue enzyme and cellular dysfunction. This mechanism can explain impaired myometrial contractility resulting in atonic uterus, as well as placental dysfunction leading to preterm birth, low birth weight and growth restricted babies and perinatal deaths. Reduced oxygen delivery can also result in impaired wound healing.

Kavle et al also found strong association of moderate to severe anemia with increased blood loss at delivery and in the post-partum period.¹¹ Wandabwa has also indicated chronic anemia as a predictor for post-partum hemorrhage.¹² Another study from Zimbabwe highlights the importance of anemia in causation of post-partum hemorrhage.¹³ Dare and colleagues found that amongst patients with puerperal sepsis, 69.2% were anemic.¹⁴ A population based study conducted in Israel by Levy et al¹⁵ found that abruptio placentae was more common in anemic subjects.

Jaleel and Khan² found a high frequency of preterm birth, low birth weight and small for gestational age infants in cases as compared to controls. Scanlon et al performed a retrospective cohort analysis of Hb and birth outcome and found 70% increased risk of preterm birth associated with moderate to severe anemia. They did not find any increased risk of small for gestational age infants.¹⁶ Lone and associates have found that risk of preterm delivery, low birth weight and small for gestational age infants in anemic women was 4, 2.2 and 1.9

times higher than in non-anemic women, respectively.¹⁷ Geelhoed¹⁸ also suggest similar results. This study has highlighted the importance of considering maternal anemia an indicator of adverse pregnancy outcome. Therefore, to reduce the burden of this problem and related morbidity, measures need to be implemented at community level, which can prevent and treat anemia in adolescent girls and women.

In our study the mean age of the patients in cases group was 26.1±3.1 years and in control group was 26.6±3.3 years. As compared with the study of Kidanto et al¹ the mean age of the patients was 24 years, which is comparable with our study.

In our study the mean gestational age in case group was 38.3±1.2 weeks and in control group was 38.6±1.2 weeks. As compared with the study of Rizvi et al⁷ the mean gestational age of the patients was 38 weeks with gestational age range of 37-42 weeks, which is comparable with our study.

In our study, in case group, there were 40% patients anemic and in control group, there were 18% patients anemic with odd ratio of 3.04 (significant) with confidence interval of 95%. As compared with the study of Jaleel and Khan² the frequency of anemia was found in 69.9% patients, which is comparable with our study.

In another study conducted by Ganesh-Kumar et al⁹ at district hospital in Karnataka in 2009 in low birth weight babies 36% were anemic mothers and in normal birth weight babies 15.3% were anemic mothers. While in our study in case group, there were 40% patients anemic and in control group, there were 18% patients anemic with odd ratio of 3.04 (significant), which is comparable with our study.

According to the study of Kidanto et al¹ the prevalence of anaemia was found in 68% patients in low birth weight neonates, which is comparable with our study. Maternal anemia is responsible for adverse pregnancy outcomes.² Pregnancy outcomes vary depending on the severity of anemia.¹ It has significant impact on health of mother as well as the health of baby.^{2,4} It is responsible for preterm labor, low birth weight babies, postpartum hemorrhage due to uterine atony, and wound infections².

On the above discussion, it is concluded that maternal anemia is a risk factor for low birth weight babies at term as compared to control group. It is also associated with preterm birth, low birth weight and small for gestational age infants, as well as low APGAR score and high perinatal mortality.

CONCLUSION

The burden of nutritional anemia in pregnant population is alarmingly high. Severe maternal

anemia carries significant risk of hemorrhage and infection in the mother. It is also associated with preterm birth, low birth weight and small for gestational age infants, as well as low APGAR score and high perinatal mortality. So, it is concluded from this study that maternal anemia is a risk factor for low birth weight babies at term as compared to control group.

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