

Association of Preterm Delivery with Maternal Anemia in Females Presenting in Active Labour for Delivery

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ABSTRACT

Aim: To assess the association of preterm delivery with maternal anemia in females presenting in active labour for delivery

Methodology: Case Control study conducted in Unit III, Department of Obstetrics & Gynecology, Fatima Memorial Hospital Lahore during a period of six months from 12-5-2017 to 13-11-2017. Total 280 pregnant females fulfilling the inclusion criteria were included. Then females were divided in two groups i.e. cases undergoing preterm delivery and controls undergoing delivery at term. Then blood sample was obtained and sent to the laboratory of the hospital for assessment of hemoglobin level.

Results: In this study mean age of cases and controls was 31.29±5.40 and 30.76±5.89 years respectively. Among cases anemia was diagnosed in 80(57.1%) women and among control it was diagnosed in 47(33.6%) women. Risk of maternal anemia was 2.63 times higher for cases as compared to controls.

Conclusion: There is high risk of anemia in women with preterm delivery, however, it can be considered as a potential risk factor for preterm delivery among women and must be treated in advance to avoid and minimize certain complications.

Keywords: Preterm, Delivery, Maternal, Anemia, Active, Labour, Delivery

INTRODUCTION

Preterm delivery is a major cause of infant morbidity and mortality, but the relationship between comorbidity and preterm delivery by clinical subtype and severity of gestational age remains poorly understood.¹The determinants of preterm delivery remain poorly understood. Evidence suggests that maternal comorbidities including maternal anemia are associated with preterm delivery.^{1,2}

Maternal anemia, a common situation in developing countries, provokes impairment of nutrients / oxygen supply to the placenta-fetus unit that leads to great obstetrical syndromes.³World Health Organization has defined hemoglobin of less than 110 g/l as anemia in pregnancy.⁴ The association between maternal anemia and preterm delivery remains equivocal with some, but not other, studies documenting increased risk⁵.

One study showed that in the term group (control), anemia was present in 31.22%, in the preterm group (cases) it was 48.62% (P=0.001)⁶. One more study showed that anemia was present in 57.8% cases (preterm deliveries) and 40.9% controls (term deliveries) and the difference was significant (P=0.001)⁷.

But one study showed that anemia was present in 30% cases (60/120) and 26.3% controls (term deliveries) and the difference was insignificant (P=0.341)⁸. One more has showed that anemia was present in 40% cases (60/120) and 39.4% controls (term deliveries) and the difference was insignificant (P>0.999)⁹

This study was planned to assess the association of preterm delivery with maternal anemia in females presenting in active labour for delivery. In a developing

country like Pakistan, anemia is common problem among pregnant females. The incidence of preterm delivery is also high. So it is thought that anemia may be risk factor for preterm deliveries in many cases.

METHODOLOGY

This case control study was done at Department of Obstetrics & Gynecology, Fatima Memorial Hospital Lahore during the year 2017 with a total of sample size 280 cases, (140 females in cases and 140 in control group), we enrolled the females of age 18-40 years, parity<5, presenting in active labour for delivery (Bishop≥5, cervical dilatation>4cm, >3contractions in 10 minute), Cases: females with preterm delivery and control group included females with term delivery (delivered >37 weeks). All females with gestational or chronic hypertension (BP≥140/90mmHg), preeclampsia (BP≥140/90mmHg with proteinuria>+1 on dipstick method), eclampsia (convulsions with BP≥140/90mmHg), diabetes (BSR>186mg/dl), having multiple gestation or fetal anomaly, and with genital tract infection (purulent/itchy vaginal discharge) were excluded from the study. Routine informed was obtained from each participant. Then blood sample was obtained by using 5cc BD syringe at the time of admission and stored in vials containing ringers lactate. All samples were sent to the laboratory of the hospital for assessment of hemoglobin level. Reports were assessed and anemia was labeled if hemoglobin <10g/L. The data analysis process was done with the help of 20th version of SPSS. After calculating mean and standard Deviation for age, gestational age, BMI and hemoglobin level, the frequency and percentage was calculated for anemia. Odds ratio was calculated to measure association between preterm delivery and

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anemia. Chi-Square was also applied & p-value <0.05 as significant. OR>1 was considered as significant.

RESULTS

In this study mean age of cases and controls was 31.29±5.40 and 30.76±5.89 years respectively (Table-1).

Among cases anemia was diagnosed in 80(57.1%) women and among control it was diagnosed in 47(33.6%) women. Risk of maternal anemia was 2.63 times higher for cases as compared to controls (Table-2).

Risk of maternal anemia was 1.28 times higher among cases in age group 22-28 years, risk of maternal anemia turn out to be 4.07 times higher among cases who were in the age group 29-34 years and cases who were in

the age group 35-40 years among them risk of maternal anemia was 3.75 higher as compared to controls (Table-3).

Table-1: Age of women

	Cases	Control
N	140	140
Mean	31.29	30.76
Standard Deviation	5.402	5.899
Minimum	22	22
Maximum	40	40

Table-2: Anemia among cases and controls

Anemia	Cases	Control	Total
Yes	80(57.1%)	47(33.6%)	127
No	60(42.9%)	93(66.4%)	153
Total	140	140	280

P-value= 0.000

Odds Ratio= 2.63

Table-3: Anemia among cases and controls stratified for age of women

Age	Anemia	Cases	Control	OR	CI	p-value
22-28	Yes	19(42.2%)	21(36.2%)	1.28	0.58-2.86	0.534
	No	26(57.8%)	37(63.8%)			
29-34	Yes	31(63.3%)	11(29.7%)	4.07	1.63-10.14	0.002
	No	18(36.7%)	26(70.3%)			
35-40	Yes	30(65.2%)	15(33.3%)	3.75	1.57-8.92	0.002
	No	16(34.7%)	30(66.7%)			

DISCUSSION

In this study risk of anemia was 2.63 times higher for women which had preterm delivery i.e. Case: 57.1% vs. Control:33.6%, Odds Ratio= 2.63, p-value=0.000.

Martí A and his colleague in their study showed that in the term group (control), anemia was present in 31.22%, in the preterm group (cases) it was 48.62% (P=0.00).⁶ Zhang X in his study showed that anemia was present in 57.8% cases (preterm deliveries) and 40.9% controls (term deliveries) and the difference was significant (P=0.001).⁷ Derakhshi B in her study showed that anemia was present in 30% cases (60/120) and 26.3% controls (term deliveries) and the difference was insignificant (P=0.341).⁸ In above mentioned studies frequency of anemia was higher in women with preterm delivery. However none of these studies reported risk (odds ratio) of anemia among women who had preterm delivery.

Anini HIS in his study showed that anemia was present in 40% cases (60/120) and 39.4% controls (term deliveries) and the difference was insignificant (P>0.999).⁹ Findings of Anini HIS is not consistent with the findings of this study as in this study women who had preterm delivery among them risk of anemia was higher as compared to controls (women with term delivery).

Lone and others¹⁰ in a study consisting of 626 cases concluded that PTB is 4.1 times higher in anemia women as compared to those with normal hemoglobin level. Same results are found in our study.

On the other hand, Levy et al. in their retrospective study, they evaluated the preterm birth and birth weights of anemic pregnant women and found no association.¹¹ Study by Umber et al showed that risk of preterm and low birth weight among anaemic woman was 3.4 and 1.8 times more than non-anaemic group¹²

Margarita E in his study reported no significant difference for anemia among cases and controls. i.e.,

Cases:66.1% & Controls:58.3, p-value=0.05¹³

However, various studies reveal that favorable pregnancy outcome is observed when maternal Hb levels are lower than the recommended cut-off value of anemia.¹⁴ A UK based study found the lower risk of preterm delivery in females having Hb levels between 96-105g/l and similar results for fetal mortality was found in US.¹⁵ Though anemia is responsible for spontaneous PTB, however, not for PPRM.⁵

Previously, it was mentioned was concern that during pregnancy normal physiological hemodilution, usually reach at nadir during end of 2nd trimester and start of 3rd trimester, may mask the association between preterm and anemia.¹⁶⁻¹⁷ However, no association have been assessed yet between 2nd and 3rd trimester haemodilution and PTB.

The data is inconsistent for adverse outcome and maternal anemia. It is also worth mentioning that anemia diagnosed in early pregnancy may be responsible for adverse outcome than diagnosed in 2nd and 3rd trimester. Equally, studies on preterm birth have paid little attention to its heterogeneous underpinnings, thereby combining etiologically distinct endpoints as being homogeneous, and perhaps leading to attenuated association measures.¹⁸⁻¹⁹

Finally, it is cleared that maternal anemia is responsible for adverse perinatal outcome. South Asian population is significantly prone to the risk of PTB in mothers with anemia despite greater efforts on mother and child health program in recent past.

CONCLUSION

Results of this study demonstrate high risk of anemia in women with preterm delivery. So it can be considered as a potential risk factor for preterm delivery among women and must be treated in advance.

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