

# Maternal and Perinatal Outcome in Anemic Pregnancies

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## ABSTRACT

**Introduction:** Anemia in pregnancy is a public health problem of developing countries and has a significant impact on the health of mother and fetus. It is one of the leading cause responsible for maternal and perinatal morbidity and mortality. **Aims:** To find out the severity of anemia in pregnancy and its maternal and perinatal outcome. **Methods:** A prospective randomized case control study undertaken in the Department of Obstetrics and Gynecology, Nepalgunj Medical College, Kolhapur from September 2019 to August 2020. Total of 200 study subjects were enrolled, cases and control were 100 each, with cut off for anemia as 11gm/dl. **Results:** Out of 100 cases of anemia, 58 were mildly anemic (Hemoglobin: 10-10.9), 23 moderately (7-10) and 21 severely anemic (<7gm/dl). Anemic cases were found to have higher incidence of preterm birth (8%), postpartum hemorrhage (5%), and maternal morbidity (19%) than in non-anemic controls. Adverse fetal outcome in the form of preterm birth (8%), Intrauterine Growth Restriction (14%), Still birth (3%), Early neonatal death (4%), Low birth weight babies (22%), neonatal morbidity (17.5%) was more in anemic group than non-anemic controls. **Conclusion:** Anemia in pregnancy has adverse effects on the mother and fetus. It is important to diagnose and treat anemia in pregnancy to ensure optimal health of mother and newborn.

**Keywords:** Anemia, Adverse Outcome, LBW (Low birth weight), PPH (Postpartum hemorrhage)

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## INTRODUCTION

Anemia in pregnancy is a public health problem of developing countries and is associated with adverse outcomes in pregnancy.<sup>1</sup> It is a condition in which the number of red blood cells of the body is insufficient to meet physiological needs. According to WHO, for pregnant women, anemia is defined as blood hemoglobin level <11 g/dL, and further categorized as mild (10.0–10.9 g/dL), moderate (7.0–9.9 g/dL), and severe anemia (<7.0 g/dL).<sup>2</sup> Iron deficiency is thought to be the most common cause of anemia worldwide. About 20% of perinatal mortality and 10% of maternal mortality in developing countries is attributed to iron deficiency.<sup>3</sup> Maternal anemia is associated with maternal and child morbidity and mortality such, as increased risk of miscarriage, stillbirth, prematurity, and low birth weight of the baby.<sup>4</sup>

Evidence shows the requirement of iron increases significantly during second and especially during third trimester of pregnancy.<sup>5</sup> During such conditions, dietary iron intake in the majority of population of the developing countries is not

sufficient.<sup>6</sup> This could be due to the low consumption of limited animal source food, green leafy vegetables and fruits in their daily life<sup>7</sup>, and high utilization of iron for oxygen supply to both mother and fetus.<sup>8</sup>

The menace of anemia is still very rampant all over the country even today in spite of improvements in diagnosis and therapy.

This fact gains mammoth importance, therefore, this study aims to determine maternal and perinatal outcomes in anemic mothers.

## METHODS

A, prospective, randomized, case control study was undertaken in the Department of Obstetrics and Gynecology, NGMC, Kohalpur from September 2019 to August 2020 to find out the severity of anemia and maternal and perinatal outcome. Ethical clearance was taken from the institutional review committee, NGMC and written informed consent was taken from each patient.

All women attending antenatal outpatient department or delivered in labor room, singleton pregnancy, in 3<sup>rd</sup> trimester with microcytic hypo chromic anemia and Hemoglobin (Hb%) < 10.9 gm/dl were included in the study whereas multiple pregnancies, gestational age < 28 weeks, in 1<sup>st</sup> and 2<sup>nd</sup> trimester with dimorphic or hemolytic anemias were excluded. There were a total of 200 study subjects. Patients were randomly divided into two groups with 100 patients as a case and another 100 as a control groups on the basis of lottery method. Hb% is taken as criteria for deciding anemia cases and also to classify the severity.

All study subjects were studied in full details in particular reference to age, literacy and socio economic status, detailed obstetric and menstrual history. Present pregnancy details regarding the number of antenatal visits, ill health, chronic infection or infestation any time during pregnancy were studied. Different mode of delivery, intrapartum and postpartum complications were studied. Detailed neonatal examination and neonatal complications are noted.

The investigations that were done in the cases were 1) Complete blood count 2) Blood grouping and Rh typing 3) Stool for ova and cysts in second trimester. 4) Urine RME 5) Obstetric scan 6) Peripheral Blood Smear. Only Hb% was done in the control group. All the study subjects were followed up till they were discharged from the hospital. Results are presented as number and percentage for corresponding each group. Chi-square test was used for the analysis of data between two groups. A p-value 0.05 or less than 0.05 was considered as statistical significance.

#### Formula used for analysis: Chi-square test

$$\chi^2 = \sum (O-E)^2/E$$

Data collected in structured proforma were entered in Microsoft Excel, compared by using chi-square test and statistical analysis was done with SPSS version 22.

## RESULTS

The study subjects were divided into two groups.

- 100 cases of anemic.
- 100 cases of non-anemic controls.

Severity of Anemia	No. of cases	Percentage (%)
Mild	58	58
Moderate	23	23
Severe	19	19
<b>Total</b>	<b>100</b>	<b>100</b>

Table I: Distribution of cases according to the severity of anemia.

Among the 100 patients with anemia, 58% had mild, 23% had moderate and 19% had severe anemia (Table I).

Variables	Cases		Controls	
	N=100	%	N=100	%
Term labor	92	92	98	98
Preterm labor	8	8	2	2
Post term	0	0	0	0
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Mode of delivery	Cases (N=100)		Controls (N=100)	
Normal vaginal	63		84	
Instrumental delivery	10		8	
LSCS(Lower Segment Caesarean Section)	27		8	
<b>Total</b>	<b>100</b>		<b>100</b>	
p= 0.01				
Labor Complications	Cases (N=100)		Controls (N=100)	
	No. of cases	%	No. of cases	%
Retained placenta	1	1	0	0
PPH	5	5	1	1
CCF	0	0	0	0

\* PPH: Postpartum hemorrhage, CCF: Congestive Cardiac Failure.

Table II: Outcome of delivered patients.

When two groups were compared, in terms of labor, mode of delivery and labor complications, the cases group had more preterm labor (8%), more underwent LSCS (27%) and had PPH (7%) as compared to controls groups (Table II).

Fetal Outcome	Cases (N=100)	Controls (N=100)	
Alive	97	100	
Stillbirth	3	0	
<b>Total</b>	<b>100</b>	<b>100</b>	
p=0.08			
Neonatal Complications	Cases (N=100)	Controls (N=100)	P-value
Preterm birth	8	2	0.05
IUGR	14	5	0.05
Still birth	3	0	0.08
ENND	4	0	0.06
Birth weight(kg)	Cases (N=100)	Controls(N=100)	
<2.5kg	22	16	
>2.5kg	78	84	
<b>Total</b>	<b>100</b>	<b>100</b>	
p= 0.28			
NICU admission	Cases (N=97)	Controls(N=100)	
No	88	94	
Yes	12	6	
<b>Total</b>	<b>100</b>	<b>100</b>	
p= 0.14			

\*IUGR: Intrauterine Growth Restriction, ENND: Early Neonatal Death.

Table III: Adverse birth outcomes.

Adverse fetal outcomes in form of Stillbirth (3%), preterm birth (8%), IUGR (14%), LBW (22%) in cases than in control groups. NICU admission (12%) was also more among cases group (Table III).

Maternal morbidity	Cases(N=100)	Controls (N=100)
Failed lactation	4	0
Wound dehiscence	6	2
Febrile morbidity	5	0
Sub involution of uterus	1	0
<b>Total</b>	<b>19</b>	<b>2</b>
Neonatal morbidity	Cases(N=97, live born cases)	Controls (N=100)
RDS	3	1
Jaundice	2	2
Pulmonary hypoplasia	1	0
HMD	1	0
MAS	10	1
Birth asphyxia	0	2
<b>Total</b>	<b>17</b>	<b>6</b>
p = 0.05 (17.5% in anemic, 6% in control)		
Perinatal Mortality	Cases(N= 100)	Controls (N= 100)
Still birth	3	0
ENND	4	0
<b>Total</b>	<b>7</b>	<b>0</b>

\*RDS: Respiratory Distress syndrome, HMS: Hyaline Membrane Diseases, MAS: Meconium Aspiration Syndrome.

**Table IV: Maternal and Perinatal outcome.**

When two groups were compared in terms of Maternal and Perinatal Outcome, the cases group had more maternal morbidity (19%), neonatal morbidity (17%) and perinatal mortality (7%) as compared to control group (Table IV).

## DISCUSSION

Anemia is one of the major nutritional deficiency disorders affecting a large proportion of the population. The high prevalence of iron and other micronutrient deficiencies among women before and during pregnancy in developing countries is of concern and maternal anemia is a cause of considerable perinatal mortality and morbidity. It is an extremely common condition in pregnancy and postpartum world-wide, conferring a number of health risks to mother and child. Maternal signs and symptoms are usually non-specific, but can include: fatigue, pallor, dyspnea, palpitations and dizziness. There are numerous well-known maternal consequences of anemia including: maternal cardiovascular strain, reduced physical and mental performance, reduced peripartum blood reserves, increased risk for peripartum blood product transfusion, and increased risk for maternal mortality. This study assessed determinants of adverse birth outcome in anemic and nonanemic patients.

In developing countries, the cause of anemia during pregnancy is multifactorial and includes nutritional deficiencies of iron, folate, vitamin B<sub>12</sub> and also parasitic diseases, such as malaria and intestinal parasitic infections. Our study showed, 58% were mildly anemic, 23% moderate and 19% were severely anemic which is comparable to the studies conducted by Thangaleela T and Vijayalakshmi P<sup>9</sup>, Anita L et al<sup>10</sup>, S parks et al.<sup>11</sup>

63% of anemic patients had normal vaginal delivery as compared to 84% of control group while 10% of anemic group and 8% of controls had instrumental delivery. 27% of anemic group as against only 8% of control group underwent LSCS. This is comparable to the study conducted by Awasthi A et al.<sup>12</sup> Anemic patients may not tolerate even the normal blood loss during delivery and leads to complications like PPH. The incidence of PPH in the present study was 5% where as it is 1% for the control group. Five of them had atonic PPH and were managed conservatively; similar results were found in S parks et al<sup>11</sup>, Awasthi A et al.<sup>12</sup> There is a high incidence of adverse fetal outcome in the form of preterm birth (8%), Low birth weight babies (22%), Birth asphyxia (7%), IUGR (14%), stillbirths (3%), early neonatal death (4%) in anemic group compared to controls. The causes of early deaths in both groups were preterm birth and respiratory distress in the present study. Similar findings were reported by S parks et al<sup>11</sup>, Awasthi A et al<sup>12</sup> and Hellen et al.<sup>13</sup>

The increased maternal and neonatal morbidity in cases in the present study is comparable to that done by Awasthi A et al.<sup>12</sup>.<sup>4</sup> The maternal morbidity in the form of failed lactation (4%), wound dehiscence (6%), febrile morbidity (5%), sub involution of uterus (1%) in cases group. The neonatal morbidity in the anemic group was 17.5% vs. 6% in the control group. Preterm birth contributed much too neonatal morbidity requiring NICU admissions.

## LIMITATION

This study only looked in the immediate outcome; further study is needed to assess the long term outcome. Confounding factors possibility is there in the outcome of fetus.

## CONCLUSION

Antenatal care, as per WHO guideline is the basic requirement for prevention, early detection and treatment of anemia. The emphasis on maternal education increases the awareness of mother regarding nutrition, contraception, birth spacing and compliance to medical advice. Joint medical and social efforts are required for overall improvement of living status of women. Iron and folic acid deficiency anemia is the most common in pregnancy, therefore adequate iron and folic acid prophylaxis is a must.

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