

## A Hospital-Based Assessment of the Maternal Anaemia and its Impact on Perinatal Outcome: An Observational Study

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### Abstract

**Aim:** The aim of the present study was to find the impact of maternal anaemia on perinatal outcome.

**Methods:** The present study was conducted in the Department of Community Medicine, Govt. Medical College & Hospital, Purnea (Bihar) for the period of one year and 200 patients were included in the study.

**Results:** Most (42% & 40%) of the pregnant women were in the 25-29 & 20-24 yrs of age group. Only (8%) of the pregnant women were less than 20 years of age and (10%) were more than 30 years. As the level of education increased, severity of anaemia decreased although the difference is not statistically significant. Most of the patients were second gravid i.e. 45%. Most the pregnant women were moderately anaemic i.e. 50% followed by mild (44%) and severe (4%) respectively. Among the pregnant women most common type of anaemia is Iron deficiency anaemia (70%) followed by Sickle cell anaemia (15%) and other cause (11.5%).

**Conclusion:** Anemia being one of the most important cause of poor foeto maternal outcome should be treated preconceptionally. There is a need of health education programmes and adequate intake of iron rich diet during pregnancy, to be strengthened for safe maternal and foetal outcomes.

**Keywords:** Anaemia, Prevalence, Pregnant women, Preterm delivery, LBW, Still birth

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### Introduction

It has long been recognized that anaemia is a major public health problem especially among poorer segments of the population in developing countries such as India, Pakistan and Bangladesh. [1] Anaemia is one of the most prevalent nutritional deficiency problems afflicting pregnant women [2], defined by the World Health Organization as haemoglobin levels of ≤

110 g/L. [3] Maternal anaemia in pregnancy is commonly considered a risk factor for poor pregnancy outcome and can result in complications that threaten the life of both mother and fetus. [4] However, the extent to which maternal anaemia affects maternal and neonatal health is still uncertain. Some studies have demonstrated a strong association between low

haemoglobin before delivery and adverse outcomes [5] while others have not found a significant association. [6]

Anemia in pregnant women has been regarded as detrimental to the fetal growth and pregnancy outcomes. Low birth weight (LBW) and preterm delivery have been persistently linked to anemia in pregnancy. [7,8] The main causes of anemia in developing countries include inadequate intake and poor absorption of iron, malaria, hookworm infestation, diarrhea, HIV/AIDS and other infections, genetic disorders (e.g., sickle cell and thalassemia), blood loss during labor and delivery, heavy menstrual blood flow, and closely spaced pregnancies. [9]

WHO has estimated that prevalence of anaemia in developed and developing countries in pregnant women is 14 percent in developed and 51 per cent in developing countries and 65-75 percent in India alone. [10] Maternal anaemia in pregnancy is commonly considered as risk factor for poor pregnancy outcome and can threaten the life of mother and fetus. [11] Anemia during pregnancy is commonly associated with poor pregnancy outcome and may lead to complication of mother like Prolonged labour and increase incidence of post-partum haemorrhage and also lead to preterm birth, low birth weight and small-for-gestational age babies and prematurity. [12,13] Anemia was classified based on the WHO criteria; HB concentration of <11 g/dl was considered as anemia. HB concentration of 10–10.9 g/dl, 7–9.9 g/dl, and <7 g/dl was considered as mild, moderate, and severe anemia, respectively. The extent up to which maternal anemia affects maternal and neonatal health is still uncertain. [14] Iron deficiency during pregnancy is thought to be caused by a combination of factors such as previously decreased iron supply, the iron requirements of growing fetus and expansion of maternal plasma volume. [15] The aim of the present study was to

find the impact of maternal anaemia on perinatal outcome.

### Materials and Methods

The present study was conducted in the Department of Community Medicine, Govt. Medical College & Hospital, Purnea (Bihar) for the period of one year and 200 patients were included in the study.

Data collection was done from the records maintained by hospital after ethical permission from institutional ethical committee. All the subjects were classified according to WHO criteria were hemoglobin estimation done by Sahli's method and treatment details i.e oral iron or intravenous iron or blood transfusion, the modes of delivery, maternal and perinatal outcome were collected from records.

We included all the women who fulfilled the following inclusion criteria:

- Attended the outpatient clinic before 16 weeks of gestation
- Age 16 years and above
- Singleton pregnancy
- Had complete medical records of the pregnancy.

Women with a past history of preterm delivery, obstetric complications or medical illnesses, except anaemia, were excluded.

Exposure (anaemia) was defined as haemoglobin level of < 11 g/dL in labour and on 2 previous occasions in the current pregnancy. Women were interviewed in the local language on the second day of delivery and the data from the interview and medical records were recorded on a pre-designed questionnaire. During antenatal care, height and weight were recorded at each antenatal visit and haemoglobin level was measured at the first antenatal visit, at 28 to 32 weeks, at 33 to 37 weeks and in labour. Women who had haemoglobin < 11 g/dL were given

oral iron; those with haemoglobin < 7 g/dL in the third trimester were given either blood transfusion or intravenous iron therapy. Information regarding gestational age at delivery, perinatal outcome (live birth, stillbirth, intrauterine death), intrauterine growth retardation

(IUGR) and the type of IUGR were noted from the medical records. Health status of

the neonate, and perinatal mortality and its cause were documented.

### Data analysis

The data were recorded in an excel sheet and descriptive analysis was performed and results were expressed in numbers and percentage.

### Results

**Table 1: Demographic details**

Age in years	N%
<20	16 (8)
20-24	80 (40)
25-30	84 (42)
>30	20 (10)
<b>Education</b>	
Illiterate	24 (12)
Primary	32 (16)
Middle	40 (20)
High school	60 (30)
Intermediate	40 (20)
Graduate	4 (2)
<b>Parity status</b>	
Primi gravida	60 (30)
Second gravida	90 (45)
Multigravida	50 (25)
<b>Degree of anaemia</b>	
Mild	88 (44)
Moderate	100 (50)
Severe	12 (6)

Most (42% & 40%) of the pregnant women were in the 25-29 & 20-24 yrs of age group. Only (8%) of the pregnant women were less than 20 years of age and (10%) were more than 30 years. As the level of education increased, severity of

anaemia decreased although the difference is not statistically significant. Most of the patients were second gravid i.e. 45%. Most the pregnant women were moderately anaemic i.e. 50% followed by mild (44%) and severe (4%) respectively.

**Table 2: Type of Anemia wise distribution of cases**

Type of Anemia	N%
Iron Deficiency Anemia	140 (70)
Sickle cell anemia	30 (15)
Thalassemia	2 (1)
Dimorphic anemia	4 (2)
Magaloblastic anemia	1 (0.50)
Others	23 (11.5)

Among the pregnant women most common type of anaemia is Iron deficiency anaemia (70%) followed by Sickle cell anaemia (15%) and other cause (11.5%).

**Table 3: Maternal outcome**

Complication during pregnancy	N%
Low birth wt.	60 (30)
Obstructed labor	4 (2)
Prolonged labor	4 (2)
Premature delivery	50 (25)
Preeclampsia	6 (3)
PPH	4 (2)
LSCS	72 (36)

Table 3 shows distribution of various maternal outcome related to anemia, in which most common found to be low birth weight (30%) followed by premature delivery (25%).

**Table 4: Fetal outcome**

Fetal outcome	N%
Full term delivery	120 (60)
Preterm delivery	34 (17)
IUD	2 (1)
FGR	16 (8)
NICU admission	28 (14)

Table 4 shows distribution of various fetal outcome in anemic mother in the form of preterm (17%) followed by NICU admission (14%) and FGR (8%).

### Discussion

Anaemia is a common problem in pregnant women in developing countries. The pregnancy outcomes show a variation depending upon the type of anaemia. Studies have demonstrated differences in outcomes in iron deficiency as compared to physiological anaemia of pregnancy. [16] In populations where the rate of anaemia is low among non-pregnant women, the primary cause of anaemia during pregnancy is likely to be plasma volume expansion, and this type of anaemia is not associated with negative birth outcomes. [17] Maternal haemoglobin values during pregnancy are associated with LBW and preterm birth in a U-shaped relationship with high rates of LBW at low and high concentrations of maternal haemoglobin. However, some of this association may result from using "lowest haemoglobin" rather than a

haemoglobin value controlled for the stage of pregnancy.

In present study, 44% were mild, 50% were moderate and 6% were severely anemic. Majority of the anemic study subjects in the present study belonged to the age group of 21-25 years (47.7%). This was comparable with the results of Alli R et al. the percentage of anemic women in his study was 40% in the same age group and Upadhyay C et al which was 46.7%. [18,19] Maternal anemia is considered as risk factor for poor pregnancy outcomes, and it threatens the life of fetus. Available data from India indicate that maternal morbidity rates are higher in anemic women. [7,20] In India, anaemia is one of the most common causes of maternal death, accounting for 20% of total maternal deaths. [21] In our study maternal outcome like obstructed labor was 2%, prolonged labor was 2%, PIH was 3%. PPH was 2%. Frequency of LSCS in anaemic patients was 36%.

High incidence of adverse fetal outcome in the form of preterm (17%), IUGR (8%),

NICU admission (14%) and IUD (1%) seen in present study. These were comparable with the observation of Upadhyay C et al where Preterm deliveries was 20%, IUGR 11.5% and IUD 3% and Awasthi A et al PT (9.5%), IUGR (37.5%) and IUD (8%) and also comparable with Rangnekar et al PT (73%), IUGR (4%) and IUD (16%). [19,22,23]

In this study most common cause of anemia is iron deficiency anemia (70%) followed by sickle cell anemia (15%) as incidence of sickle cell anemia is very high in Chhattisgarh as shown in study of Lagoo J et al. (17%). Similarly, Cochrane review 2009 shows that microcytic hypochromic anemia resulting from iron deficiency is the most frequent form of anemia (76%), followed by folate deficiency (20%) and combined iron and folate deficiency (20%). [24,25]

In the present study 90.4% of subject received oral iron. 26.9% and 19.4% received parenteral iron and blood transfusion respectively. Which is similar to Upadhyay C et al where 91.5% of subject received oral iron. 51.5% and 13.5% received parenteral (IV) iron and blood transfusion respectively. There was a statistical association between anemia and complications during pregnancy. In the present study, maternal outcome related to anemia, most common found to be low birth weight (30%) followed by premature delivery (25%), and other fetal outcome in anaemic mother are in form of preterm (17%), NICU admission (14%) and FGR (8%) which is similar to the study by Nair et al. [26,27]

### Conclusion

Anemia is usually ignored in pregnant females in our rural population and poor communities of our cities, but this is a serious alarm for both mother and the baby and needs to be dealt on priority basis. To improve maternal and fetal outcome it is recommended that primary health care has to be strengthened, emphasizing the

importance of consumption of iron and folic acid in pregnancy. So, the only way to reduce these complications is early screening for anemia and giving proper, effective treatment and counseling about the same.

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