OPEN ACCESS

Corresponding Author
Annesha Dutta,
Department of Obstetrics and
gynaecology, All India Institute of
Medical Sciences, Kalyani,
Basantapur, West Bengal Kolkata
741245, India
anneshadatta2@gmail.com

Author Designation
[1]Specialist
[2]Senior Resident

Predictors of Maternal and Fetal Outcome in Severely Anemic Pregnant mothers

[1]Ambe Shah and [2]Annesha Dutta
[1]*Department of Obstetrics and Gynaecology, District Hospital, Waidhan, Madhya Pradesh 486886, India*
[2]*Department of Obstetrics and Gynaecology, All India Institute of Medical Sciences, Kalyani, Basantapur, West Bengal Kolkata 741245, India*

ABSTRACT
The most prevalent medical condition during pregnancy is anemia, which is more common in developing nations. Its frequency, cause and severity vary depending on the population. To investigate the cause of the persistence of severe anemia in pregnant women and to learn about the maternal and fetal outcomes in cases of very anemic pregnant women as well as the factors that are related to it. The present study was it is a prospective cohort study. This Study was conducted from One year at District Hospital Singrauli (M.P) department Obstetrics and Gynaecology. Total 100 patients were included in this study. In our study, 15 (15.0%) patients had Meconium stained liquor, 25 (25.0%) patients had Respiratory distress, 14 (14.0%) patients had Seizures, 20(20.0%) patients had Lethargy, 22 (22.0%) patients had Refusal of feeds and 4 (4.0%) patients had Congenital anomalies (B/L CTEV). The value of z is 3.7847. The value of p = 0.00016. The result is significant at $p<0.05$. We came to the conclusion that if anemia is not treated in the first trimester, problems are likely to arise in both the mother and the newborn.

INTRODUCTION

The most prevalent medical condition during pregnancy is anemia, which is more common in developing nations. Its frequency, cause and severity vary depending on the population. According to the criteria provided by the World Health Organization (WHO), a hemoglobin content of less than 11 g dL^{-1} (7.5 mmol L^{-1}) and a hematocrit of less than 0.332 is considered anemia in pregnancy. The WHO uses the following hemoglobin cut-offs to define the severity of anemia in pregnant women, 100 to 109 g L^{-1} as mild anemia, 70 to 99 g L^{-1} as moderate anemia and less than 70 g L^{-1} for severe anemia[1]. Iron deficiency is thought to be the cause of over 90% of anemia cases in India, as high dietary needs for iron during pregnancy are difficult to meet, particularly when iron bioavailability is low[1].

An important dietary issue for public health that affects people of all ages is iron deficiency anemia. Across the globe, 1.62 billion people are anemic (24.8%) and among pregnant women 41.8% are anemic. India has one of the highest prevalences of anemia (74.3%) in the world in the general population and more than half (56%) pregnant women in impoverished nations, like as India, are anemic. The primary causative causes of anemia during pregnancy in the nation are low iron bioavailability in the Indian food and inadequate dietary iron intake. The problem is made worse by blood loss from hookworm infestation, vitamin B12 insufficiency and malarial infection. One of the key variables that affects how a pregnancy turns out is maternal anemia, which also causes a higher rate of preterm deliveries, low birth weights and high perinatal deaths[2]. Iron deficiency is the leading cause of anemia in women of reproductive age globally. It arises from a prolonged negative iron balance and accounts for 50% of anemia in women worldwide[3]. According to WHO statistics, postpartum hemorrhage accounts for 25% of maternal mortality and is strongly correlated with the severity of anemia. Compared to nonanemic women, pregnant women with moderate-to-severe anemia lost an average of 91 mL more blood overall during their pregnancy[4].

Poor neonatal outcomes, including preterm delivery, low birth weight, low Apgar scores and intrauterine fetal mortality, are also linked to anemia[4]. The government has taken several steps to combat anemia in adolescents, such as weekly iron and folic acid supplements and free iron tablet supplies during pregnancy but the rate of severe anemia is still rising, which raises the morbidity and mortality rates of both mothers and newborns during the prenatal period.

MATERIALS AND METHODS

Study design: prospective cohort study.

Place of study: District Hospital Singrauli (M.P).

Period of study: 1 Year

Study population: Describe the specific group of participants who were included in the study. In this case, it would be severely anemic pregnant women.

Sample size: 100

Case, control required or not: Not

Inclusion:
- Diagnosis of Severe Anemia: Hemoglobin levels less than 7 g/dL or as defined by the study criteria
- Pregnancy Status: Pregnant women at any stage of pregnancy, or specify if there was a particular gestational age range (e.g., second or third trimester)
- **Age range:** Specify any age limits if applicable (e.g., 18-45 years)
- Written Informed Consent: Willingness to participate in the study and provide consent for data collection and analysis

Exclusion criteria:
- **Non-severe anemia:** Hemoglobin levels above the threshold for severe anemia
- **Concurrent medical conditions:** Conditions such as severe chronic illness, multiple pregnancies, or active infection that could confound results
- **Other obstetric complications:** Severe preeclampsia, eclampsia, or other conditions that could impact maternal or fetal outcomes independently of anemia
- **Non-compliance:** Inability or unwillingness to adhere to study protocols or follow-up requirements

RESULTS

In our study, 12(12.0%) patients had Preterm Labour, 22 (22.0%) patients had Inadequate Lactation, 17 (17.0%) patients had Puerperal Febrile Illness, 13 (13.0%) patients had Episiotomy Site Infection, 12 (12.0%) patients had Surgical Site Infection, 8(8.0%) patients had Preeclampsia, 7 (7.0%) patients had Surgical Wound Dehiscence, 4 (4.0%) patients had PPH, 3 (3.0%) patients had Abruption Placenta and 2 (2.0%) patients had Placenta Previa (Table 1).

The value of z is 4.3519. The value of p <0.00001. The result is significant at p<0.05. In our study, 15 (15.0%) patients had Meconium-stained liquor, 25 (25.0%) patients had Respiratory distress, 14 (14.0%) patients had Seizures, 20 (20.0%) patients had Lethargy, 22 (22.0%) patients had Refusal of feeds and 4 (4.0%) patients had Congenital anomalies (B/L CTEV). The value of z is 3.7847. The value of p = 0.00016. The result is significant at p<0.05. In Crude OR with 95% CI, the mean Age (mean± s.d.) of patients was 2.315±1.693. In Adjusted OR with 95% CI, the mean Age (Mean±S.D.) of patients was 1.927±1.634. Distribution of mean Age with Variables was statistically significant (p<0.0001) (Table 2).

In Crude OR with 95% CI, the mean BMI (Mean±S.D.) of patients was 1.786±1.267. In Adjusted OR with 95% CI, the mean BMI (Mean±S.D.) of patients was 3.673±1.236. Distribution of mean BMI with Variables was statistically significant (p<0.0001). In Crude OR with 95% CI, the mean Hb% (Mean±S.D.) of patients was 3.691±2.824. In Adjusted OR with 95% CI, the mean Hb% (Mean±S.D.) of patients was 2.579±2.482. Distribution of mean Hb% with Variables was statistically significant (p<0.0001) (Table 3).

In Crude OR with 95% CI, the mean Multi (MeaN±S.D.) of patients was 2.458±2.367. In Adjusted OR with 95% CI, the mean Multi (Mean±S.D.) of patients was 3.246±2.546. Distribution of mean Multi with Gravida was statistically significant (p<0.0001). In Crude OR with 95% CI, the mean Caessorean section (Mean±S.D.) of patients was 1.256±1.025 In Adjusted OR with 95% CI, the mean Caessorean section (MeAN±S.D.) of patients was 2.256±2.054. Distribution of mean Caessorean section with Mode of delivery was statistically significant (p<0.0001).

DISCUSSION

Johnson *et al.*[5] showed that Pregnancy-induced hypertension (PIH) and anemia are two important high-risk disorders that can significantly affect a mother's health throughout her pregnancy.

It was shown that the majority of patients had inadequate lactation [22 (22.0%)]. It was statistically significant (p<0.00001), (z = 4.3519).

Matthay *et al.*[6] found that acute respiratory distress syndrome (ARDS) is characterized by the sudden onset of hypoxemia, noncardiogenic pulmonary oedema and the requirement for mechanical ventilation. It is a common cause of respiratory failure in critically sick patients.

We found that respiratory discomfort affected most of the patients [25 (25.0%)] and it was statistically significant (p = 0.00016), (z = 3.7847)

We demonstrated that the mean age in the crude OR with 95% CI was higher [2.315±1.693] compared to Adjusted OR with 95% CI [1.927±1.634] but this was statistically significant (p<0.0001).

The mean BMI was higher in the Adjusted OR with 95% CI, as we discovered [3.673±1.236] compared to Crude OR with 95% CI [1.786±1.267] but this was statistically significant (p<0.0001).

We observed that, mean Hb% was more in Crude OR with 95% CI [3.691±2.824] compared to Adjusted OR with 95% CI [2.579±2.482] but this was statistically significant (p<0.0001).

We showed that, mean Multi was more in Adjusted OR with 95% CI [3.246±2.546] compared to Crude OR with 95% CI [2.458±2.367] but this was statistically significant (p<0.0001).

Table 1: Maternal complications in severely anemic pregnant women

Complications	Frequency (n)	Percentage
Preterm labour	12	12.0
Inadequate lactation	22	22.0
Puerperal febrile illness	17	17.0
Episiotomy site infection	13	13.0
Surgical site infection	12	12.0
Preeclampsia	8	8.0
Surgical wound dehiscence	7	7.0
PPH	4	4.0
Abruption placenta	3	3.0
Placenta previa	2	2.0
Cardiac Failure	0	0.0
Mortality	0	0.0
Total	100	100.0

Table 2: Fetal complications in severely anemic pregnant women

Complication	Frequency (n)	Percentage
Meconium stained liquor	15	15.00
Respiratory distress	25	25.00
Seizures	14	14.00
Lethargy	20	20.00
Refusal of feeds	22	22.00
Congenital anomalies (B/L CTEV)	4	4.00
Total	100	100.00

Table 3: Factors associated with maternal complications in severely anemic pregnant women (N = 100)

Variables	Crude OR with 95% CI		Adjusted OR with 95% CI		
	Mean	SD	Mean	SD	p-value
Age	2.315	1.693	1.927	1.634	<0.0001
BMI	1.786	1.267	3.673	1.236	<0.0001
Hb%	3.691	2.824	2.579	2.482	<0.0001
Gravida					
Multi	2.458	2.367	3.246	2.546	<0.0001
Mode of delivery					
Caessorean section	1.256	1.025	2.256	2.054	<0.0001

SD: Standard deviation

The average Caessorean section was higher in the 95% confidence interval's adjusted OR [2.256±2.054] compared to Crude OR with 95% CI [1.256±1.025] but this was statistically significant (p<0.0001).

CONCLUSION

We came to the conclusion that if anemia is not treated in the first trimester, problems are likely to arise in both the mother and the newborn. In the current investigation, nutritional anemia was most likely the reason because early-arriving patients had improved treatment outcomes for both the mother and the fetus. The likelihood of decreased birth weight, premature labor and puerperal problems increased with decreasing hemoglobin levels.

REFERENCES

1. Devi, N.B., B. Varalaxmi, T. Jyothirmay and N. Lahari , 2015. Maternal outcome in pregnancy with severe anemia: Prospective study in a tertiary care hospital in Andhra Pradesh. IOSR J. Den. Med. Sci., 14: 6-10.

2. Kaur, M., A. Chauhan, M.D. Manzar and M.M. Rajput, 2015. Maternal anaemia and neonatal outcome: A prospective study on urban pregnant women. J. Clin. Diagn. Res., 9: QC04-QC8.

3. Goswami, T.M., V.N. Patel, N.H. Pandya, A.K. Mevada, K.S. Desai and K.B. Solanki, 2014. Maternal anaemia during pregnancy and its impact on perinatal outcome. Int. J. Biomed. Adv. Res., 5: 99-102.

4. Fadel, M.G., W. Yoong and J. Luis, 2016. Severe iron deficiency anemia on maternal and neonatal outcomes. J. Preg. Child Health, 3: 10-12.

5. Johnson, A., S. Vaithilingan and S.L. Avudaiappan, 2023. The interplay of hypertension and anemia on pregnancy outcomes. Cureus, Vol. 15, No. 10.

6. Matthay, M.A., C.S. Calfee, H. Zhuo, B.T. Thompson and J.G. Wilson *et al.*, 2019. Treatment with allogeneic mesenchymal stromal cells for moderate to severe acute respiratory distress syndrome (START study): A randomised phase 2a safety trial. Lancet Respir. Med., 7: 154-62.