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A Prospective Study of Fetomaternal Outcomes in Severe Anemia (Hb <7grams) Over A Period of 6 Months in Tertiary Care Hospital

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ABSTRACT

Background: Severe anemia in pregnancy remains a major public health problem in developing countries and is associated with increased maternal and perinatal morbidity and mortality. Early identification and appropriate management are essential to improve fetomaternal outcomes.
Objectives: To evaluate the fetomaternal outcomes among pregnant women diagnosed with severe anaemia
Methods: A prospective observational study was conducted from March 2024 to august 2024 in the Department of Obstetrics and Gynecology, Government General Hospital, Guntur. All detailed data such as Demographic details, obstetric characteristics, clinical presentation, management, maternal and neonatal outcomes were recorded and analyzed from pregnant women with hemoglobin < 7 grams/dl
Results: Severe anaemia was predominantly observed among women belonging to lower socioeconomic groups and multigravidae. Common maternal complications included preterm labour, postpartum hemorrhage, preeclampsia, and increased requirement for blood transfusion. Neonatal complications included low birth weight, prematurity, neonatal intensive care unit admission, and perinatal mortality. Appropriate antenatal care and timely correction of anemia were associated with improved maternal and fetal outcomes.
Conclusion: Severe anemia during pregnancy is associated with significant adverse fetomaternal outcomes. Strengthening antenatal screening, nutritional interventions, iron supplementation, and timely referral to higher centers can substantially reduce complications and improve pregnancy outcomes.

Keywords: *Severe anemia, Hemoglobin, Pregnancy, Maternal outcome, Fetal outcome, Blood transfusion.*

INTRODUCTION

Anemia during pregnancy continues to be a major public health problem worldwide, particularly in developing countries such as India, where it contributes significantly to maternal and perinatal morbidity and mortality. According to the World Health Organization (WHO), anemia in pregnancy is defined as hemoglobin concentration < 11 grams/dl , while severe anemia is defined as hemoglobin levels < 7 grams/dl.[1]Pregnancy is associated with physiological hemodilution due to expansion of plasma volume, which may aggravate pre-existing anemia and reduce oxygen-carrying capacity.[2] Severe anemia compromises oxygen delivery to maternal tissues and the developing fetus, resulting in adverse maternal and fetal outcomes.[3]

Maternal complications associated with severe anemia include preterm labour, postpartum hemorrhage, puerperal sepsis, cardiac failure, increased need for blood transfusion, and maternal mortality.[3,4] Fetal complications include intrauterine growth restriction, low birth weight, prematurity, birth asphyxia, and increased perinatal mortality.[4,5] Despite various national initiatives such as the National Iron Plus Initiative and intensified antenatal care services, the prevalence of anemia in pregnancy remains high due to poor nutritional status, inadequate antenatal care, low

socioeconomic pregnancy conditions, and poor compliance with iron supplementation.[6,7] Therefore, the present study was undertaken to prospectively evaluate the fetomaternal outcomes among pregnant women with severe anemia.

Objectives:

- To assess the fetomaternal outcomes in pregnancies complicated by severe anemia
- To identify the maternal complications associated with severe anemia
- To evaluate neonatal outcomes among women with severe anemia
- To determine the need for blood transfusion and critical care support in pregnant women with severe anemia.

MATERIALS AND METHODS

Study Design: Prospective observational study

Study Setting: Department of Obstetrics and Gynecology at a tertiary care teaching hospital

Study Duration: March 2024 -August 2024

Study Population: Pregnant women presenting to the antenatal outpatient department (OPD) or labour ward and diagnosed with severe anemia were enrolled in the study.

Inclusion Criteria:

- Pregnant women with a hemoglobin level of <7 g/dL.
- Gestational age between 28 and 40weeks.
- Antenatal women who provided written informed consent to participate in the study

Exclusion Criteria:

- Known hemoglobinopathies, chronic systemic illnesses, such as renal or cardiac disease.
- Acute obstetric hemorrhage.

Sample Size:
A total of 50 antenatal women with severe anemia were included in the study

Data Collection: Data collection was commenced only after approval from the Institutional Ethics Committee, written informed consent was obtained from all the participants before their enrollment in the study, each participant underwent a detailed clinical evaluation including:
Demographic profile: age, parity, socioeconomic status
Antenatal care status: booked/unbooked Clinical examination findings, laboratory investigations, including hemoglobin estimation, peripheral smear, additional tests where feasible

Management Protocol: Patients received appropriate management based on clinical condition: Statistical Analysis: SPSS 26.0 was used for analysis, results were expressed in terms of percentages, mean, and standard deviation.

RESULTS

Table 1. Age Distribution

S.NO	Age group	Number of cases(n)	Percentage (%)
1.	<20 years	2	4%
2.	20-24 years	32	64%
3.	25-29 years	13	26%
4.	30-34 year	2	4%
5.	≥35 years	1	2%
6.	Total	50	100%

Majority of the severe anemia cases belonged to the 20-24 years age group 64% (n= 32).

Table 2. Residence

S.NO	Residence	Number of cases(n)	Percentage (%)
1.	Rural	36	72%
2.	Urban	14	28%
3.	Total	50	100%

The majority of women with severe anemia were from rural areas 72% (n= 36).

Table 3. Educational Status

S.NO	Education	Number of cases(n)	Percentage (%)
1.	Illiterate	22	44%
2.	Primary	18	36%
3.	Secondary	9	18%
4.	Graduate+	1	2%
5.	Total	50	100%

Most women were illiterate (44%), followed by those with primary education (36%).

Table 4. Socioeconomic Status

S.NO	Class	Number of cases(n)	Percentage (%)
1.	Upper	0	0%
2.	Upper Middle	2	4%
3.	Lower Middle	5	10%
4.	Upper Lower	13	26%
5.	Lower	30	60%
6.	Total	50	100%

The majority women of with severe anemia belonged to the lower socioeconomic class 60% (n=30).

Table 5. Booking status

S.NO	Status	Number of cases (n)	Percentage (%)
1	Booked	16	32%
2	Unbooked	34	68%
3	Total	50	100%

Out of the 50 women, 68% (n=34) were unbooked

Table 6. Gravidity

S.NO	Gravidity	Number of cases (n)	Percentage (%)
1.	Primigravida	14	28%
2.	Multigravida	34	68%
3.	Grand multigravida	2	4%
4.	Total	50	100%

The majority of women were multigravida 68% (n=34)

Table 7. Gestational Age at Admission

S.NO	Gestational age	Number of cases (n)	Percentage (%)
1.	28–31+6 weeks	9	18%
2.	32–36+6 weeks	26	52%
3.	≥37 weeks	15	30%
4.	Total	50	100%

Most women with anemia were admitted between 32and 36+6 weeks of gestational age52%(n=26).

Table 8. Severity of Anemia

S.NO	Severity	Number of cases(n)	Percentage (%)
1.	Severe	45	90%
2.	Very severe	5	10%
3.	Total	50	100%

Most women had severe anemia 90%(n=45) while 10% had severe anemia.

Table 9. Blood transfusion Requirements

S.NO	Units	Number of cases(n)	Percentage (%)
1.	1	16	32
2.	2	20	40
3.	3	10	20
4.	≥4	4	8
5.	Total	50	100

Most women 40% (n =20) received 2 units of blood transfusion.

Table 10. Mode of Delivery

S.NO	Mode of delivery	Number of cases (n)	Percentage (%)
1.	Vaginal	28	56%
2.	Instrumental	12	24%
3.	Cesarean	10	20%

In the present study 56% women delivered by vaginally, while 24% underwent assisted vaginal delivery.

Table 11. Birth Weight

S.NO	Birth Weight	Number of cases (n)	Percentage (%)
1.	<2 kg	11	22%
2.	2–2.49 kg	22	44%
3.	2.5–3.49 kg	16	32%
4.	≥3.5kg	1	2%
5.	Total	50	100

Most newborns 44 % (n=22) had a birth weight of 2.0-2.49kg.

Table 12. Gestational Age at Delivery

S.NO	Outcome	Number of cases(n)	Percentage (%)
1.	Preterm	32	64%
2.	Term	18	36%

In the present study 64%(n=32) of deliveries were preterm.

Table 13. Maternal and Fetal outcomes among Women with severe anaemia

S. NO.	Maternal & Fetal Outcome	Number of Cases(n)	Percentage (%)
1.	Postpartum hemorrhage	7	14%
2.	Preeclampsia	6	12%
3.	Antepartum hemorrhage	5	10%
4.	Delayed wound healing	5	10%
5.	Lactation failure	5	10%
6.	Thromboembolic disorders	2	4%
7.	Puerperal sepsis	1	2%
8.	Intensive care unit (ICU)	2	4%
9.	Intrauterine fetal demise	1	2%
10.	Neonatal Intensive Care Unit (NICU)	14	28%
11.	Low Apgar score	12	24%

In the present study, postpartum hemorrhage was the most common maternal complication, occurring in 7 (14%) of women, followed by preeclampsia in 6 (12%) NICU admission was required for 14 (28%) of newborns, while 12 (24%) of newborns had a low Apgar score.

DISCUSSION

The present study demonstrated that severe anemia during pregnancy is associated with significant adverse maternal and neonatal outcomes. A large proportion of women in our study were unbooked and had received inadequate antenatal care. Similar observations have been reported by Singh S, Kaur K et al.who found that inadequate antenatal care and delayed diagnosis contributed significantly to severe anemia [2]

Postpartum hemorrhage was one of the common maternal complications observed in the present study. similar findings have been reported by Cheng et al. [6,12]. Severe anemia reduces the physiological reserve of pregnant women and may predispose them to poor tolerance of blood loss during delivery.[3]. The high requirement for blood transfusion observed in the present study is comparable to findings reported by CLIP India Trial [5].

Preterm labour and low birth weight were among the major fetal complications identified. Maternal anemia leads to chronic fetal hypoxia and impaired placental function, resulting in restricted fetal growth and premature delivery which is comparable with the Rahman et al study [4,9]. In a large systematic analysis, reported a significant association between maternal anemia and adverse birth outcomes including low birth weight and preterm birth.[4,7] The increased incidence of NICU admission and newborn with low Apgar were observed in the present study is also consistent with previous reports indicating that severe maternal anemia adversely affects neonatal survival and immediate postnatal adaptation.[5,9,10]

Overall, the findings of the present study support existing evidence that severe anemia remains an important and preventable contributor to adverse fetomaternal outcomes. Early diagnosis through routine antenatal screening and timely management with iron therapy and blood transfusion where indicated can substantially improve maternal and neonatal health outcomes. [8,9,11]

CONCLUSION:

Severe anemia during pregnancy is associated with significant adverse maternal and neonatal outcomes, including preterm labour, postpartum hemorrhage, increased blood transfusion requirement, low birth weight, prematurity, NICU admission, and increased perinatal morbidity. The findings of this prospective observational study highlight that women from lower socioeconomic backgrounds and those with inadequate antenatal care are at greater risk of developing severe anemia and its associated complications, early detection through routine antenatal screening, prompt correction of anemia with Iron therapy and blood transfusion when indicated, appropriate nutritional counseling, and timely referral to tertiary care centers can substantially improve maternal and neonatal outcomes. Strengthening antenatal care services, improving community awareness regarding maternal nutrition and iron supplementation, and ensuring early identification and management of severe anemia should remain public health priorities for reducing maternal and neonatal morbidity and mortality.

Conflict of interest: The authors declare that there is no conflict of interest regarding the publication of this article.

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Ethical Approval: The study was approved by the institutional Ethics Committee.

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