

To Study Maternal and Fetal Outcome in Severe Anemia in Gujarat Adani Institute of Medical Sciences, Bhuj, Kachchh

Payal Bhagora¹, Vinod Makwana², Trupangi Chaudhari³

¹Senior Resident, Department of Obstetrics and Gynecology, GMERS Medical College Himmatnagar, Gujarat, India

²Consultant Gynecologist, Ayush hospital Mehsana, Gujarat, India

³Consultant Gynecologist, Janak Smarak Trust Hospital Vyara, Gujarat, India

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Corresponding Author: Dr. Payal Bhagora

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Abstract:

Background: Severe anemia in pregnancy remains a major public health concern in India, contributing significantly to maternal and fetal morbidity and mortality. Early detection and appropriate management are crucial to improving outcomes.

Aim: To study the cases of severe anemia during pregnancy and evaluate their effects on maternal and fetal outcomes at Gujarat Adani Institute of Medical Sciences, Bhuj, and Kachchh.

Material and Methods: A prospective observational study was conducted at G.K. General Hospital, Bhuj, from November 2019 to October 2021. A total of 150 antenatal and/or intranatal patients with severe anemia (Hb <7.0 gm %) and ≥28 weeks gestation was included. Detailed clinical history, obstetric examination, and relevant investigations were performed. Patients were managed with oral iron, parenteral iron, or blood transfusions as appropriate and followed for maternal and fetal outcomes.

Results: The majority of patients (42%) were aged 25–29 years, with 55.33% booked and 44.67% unbooked. Severe anemia (Hb 4–6.9 gm %) was seen in 93.33% and very severe anemia (<4 gm %) in 6.66%. Vaginal delivery was the predominant mode (86.66%), with LSCS in 13.33%. Fetal outcomes included 91.33% live births, 8.66% stillbirths/IUD, 47% preterm births, and 41% NICU admissions. Maternal complications included infections, preterm labor, and cardiac strain.

Conclusion: Severe anemia significantly impacts both maternal and fetal health, increasing the risk of preterm birth, NICU admission, and stillbirth. Strengthening antenatal care, early screening, and appropriate anemia management are essential to improve maternal and fetal outcomes.

Keywords: Severe Anemia, Pregnancy, Maternal Outcome, Fetal Outcome, Antenatal Care.

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Introduction

Anemia during pregnancy remains a significant public health challenge globally, particularly in developing countries like India. The World Health Organization (WHO) defines anemia in pregnancy as hemoglobin (Hb) levels less than 11 g/dL, with severe anemia classified as Hb <7 g/dL [1]. Severe anemia poses substantial risks to both maternal and fetal health, contributing to maternal mortality, preterm birth, low birth weight, intrauterine growth restriction (IUGR), and perinatal mortality [2,3].

In India, anemia is responsible for approximately 20% of all maternal deaths, making it a leading preventable cause of maternal morbidity and mortality [4].

According to the National Family Health Survey-5 (NFHS-5), the prevalence of anemia among pregnant women in India remains alarmingly high at around 52%, with rural areas like Gujarat

showing particularly concerning trends [5]. Factors such as poor nutritional status, inadequate iron supplementation, frequent pregnancies, hookworm infestation, and malaria contribute significantly to this burden [6]. The maternal consequences of severe anemia include increased risk of heart failure, infections, postpartum hemorrhage, and delayed wound healing, while fetal complications include prematurity, low birth weight, stillbirth, and neonatal death [7,8].

Recent studies have emphasized that timely detection and management of severe anemia during pregnancy can markedly improve both maternal and neonatal outcomes [9].

Strategies like routine antenatal screening, iron and folate supplementation, deworming, nutritional counseling, and, where needed, parenteral iron therapy or blood transfusions have been shown to

reduce adverse outcomes [10]. Despite multiple national programs, severe anemia continues to be under-recognized and inadequately managed, especially in semi-urban and rural India. Gujarat, a state with both urban hubs and large rural populations, provides a crucial setting to study the real-world burden and consequences of severe anemia during pregnancy.

This study aims to investigate the maternal and fetal outcomes among women with severe anemia in pregnancy attending Gujarat Adani Institute of Medical Sciences, Bhuj, and Kachchh. The findings are expected to generate insights that will aid in strengthening antenatal care strategies and improving perinatal outcomes in this vulnerable population.

Material and Methods

This prospective observational study was conducted in the Department of Obstetrics and Gynecology, G.K. General Hospital, Bhuj, Kachchh, after obtaining ethical clearance from the Institutional Ethical Committee. The study was carried out over a period of two years, from November 2019 to October 2021. A total of 150 antenatal and/or intranatal cases with severe anemia were included in the study.

Patients presenting with severe anemia in the emergency labor room or outpatient department (OPD) were enrolled and evaluated for maternal and fetal outcomes.

Inclusion Criteria

- All emergency and antenatal patients booked attending G.K. General Hospital.
- Hemoglobin level <7.0 gm%.
- Gestational age ≥ 28 weeks.

Exclusion Criteria

- Acute hemorrhage in the antenatal, intranatal, or postnatal period.
- Hemoglobin >7.0 gm%.
- Gestational age <28 weeks.
- Known cases of thalassemia or sickle cell anemia.

On admission, detailed demographic and obstetric histories were recorded, including gravida, parity, and interval between deliveries, present obstetric complaints, and symptoms related to severe anemia (breathlessness, chest pain, palpitations, pedal edema, and weakness).

Potential contributing factors such as nutritional status, menstrual history, bleeding history, infections, and worm infestations were also documented.

Patients with pallor presenting to the OPD were investigated with hemoglobin estimation, classified

according to WHO criteria, and admitted if Hb was <7 gm%. A thorough general, systemic, and obstetric examination was performed. Per abdominal examination was conducted for all patients, while per speculum and per vaginal examinations were done as required.

Investigations

- Hematological: Complete blood count, blood indices, peripheral smear, blood grouping.
- Biochemical: Liver function test, renal function test.
- Urine analysis (routine and microscopy), stool examination for ova, cyst, and occult blood.
- Specific tests (when indicated): Hb electrophoresis, sickling test, coagulation profile, serum protein, serum ferritin, thyroid function tests, ECG, USG abdomen and pelvis, chest X-ray, 2D echocardiography.
- Hemoglobin estimation was done using an automated hematology analyzer.

Patients were classified based on WHO anemia severity criteria. Management was tailored to anemia severity and gestational age, including oral iron therapy, parenteral iron, or blood transfusion. All patients were closely followed during antepartum, intrapartum, and postpartum periods.

Outcome Measures

- **Antepartum complications:** Infections, toxemia, intrauterine growth restriction (IUGR), preterm labor, antepartum hemorrhage, cardiac failure, preeclampsia.
- **Intrapartum details:** Mode of delivery, birth weight, newborn status, Apgar scores.
- **Postpartum complications:** Infections, subinvolution, lactation failure.

Data Analysis

All data were systematically recorded and entered into predesigned study proformas. Descriptive statistical analysis was performed, and results were summarized in tables.

Results

Table 1 shows the age-wise distribution of patients with severe anemia, where the majority (42%) were in the 25–29 years group, followed by 34.66% in the 21–24 years group, indicating that the peak childbearing age is most affected.

Table 2 highlights the booking status, showing that 55.33% of cases were booked and 44.67% were unbooked, reflecting the crucial role of regular antenatal care in preventing severe anemia.

Table 3 presents the severity of anemia among the participants, revealing that 93.33% had severe anemia (Hb 4–6.9 g/dL) and 6.66% had very severe

anemia (Hb <4 g/dL), emphasizing the urgent need for medical intervention.

Table 4 summarizes the mode of delivery, with 86.66% of patients delivering vaginally and 13.33% undergoing LSCS, while no instrumental deliveries were recorded, showing that vaginal delivery remained the predominant mode despite anemia. Table 5 shows the fetal outcomes, reporting that 91.33% of cases resulted in live

births while 8.66% ended in stillbirth or intrauterine death, underscoring the significant impact of maternal anemia on fetal survival. Table 6 outlines the perinatal morbidity and mortality, noting that preterm birth was the most common complication (47%), followed by NICU admission (41%), low APGAR scores (6%), IUGR (3%), and neonatal deaths (3%), highlighting the vulnerability of neonates born to anemic mothers.

Table 1: Age-wise distribution of patients

Age Group (years)	Number of Patients	Percentage (%)
<20	16	10.66
21–24	52	34.66
25–29	63	42.00
>30	19	12.66
Total	150	100

Table 2: Booking status and severe anemia

Booking Status	Number of Patients	Percentage (%)
Booked	83	55.33
Unbooked	67	44.67
Total	150	100

Table 3: Severity of anemia

Hemoglobin Level (g/dL)	Number of Patients	Percentage (%)
4–6.9 (Severe)	140	93.33
<4 (Very Severe)	10	6.66
Total	150	100

Table 4: Mode of delivery

Mode of Delivery	Number of Patients	Percentage (%)
Vaginal Delivery	130	86.66
LSCS (C-section)	20	13.33
Instrumental Delivery	0	0.00
Total	150	100

Table 5: Fetal outcome and severe anemia

Fetal Outcome	Number of Cases	Percentage (%)
Live Birth	137	91.33
Stillbirth/IUD	13	8.66
Total	150	100

Table 6: Perinatal morbidity and mortality

Perinatal Outcome	Number of Cases	Percentage (%)
Preterm Birth	70	47.00
Low APGAR Score	9	6.00
IUGR	5	3.00
NICU Admission	62	41.00
Neonatal Death	5	3.00

Discussion

Severe anemia in pregnancy continues to be a major public health challenge in India, particularly in rural areas like Kachchh.

In this study, the majority of patients were between 25–29 years of age, which aligns with the peak

childbearing age group, as reported in other Indian and global studies [11]. This emphasizes the importance of targeted screening and prevention strategies for women in this age bracket. More than 44% of women were unbooked, reflecting a lack of adequate antenatal care. Studies have consistently shown that unbooked status is strongly associated

with worse maternal and fetal outcomes due to missed opportunities for early detection and treatment of anemia [12]. This calls for strengthening outreach services and community health worker involvement to ensure early ANC registration and follow-up. The high prevalence of severe anemia (93.33%) and very severe anemia (6.66%) in our population is alarming. Similar prevalence rates have been reported in low-resource settings where nutritional deficiencies, poor healthcare access, and socio-economic constraints contribute to anemia burden [13]. Comprehensive public health strategies, including nutrition programs, iron-folic acid supplementation, and deworming, are critical to reducing this burden.

Regarding maternal outcomes, vaginal delivery was achieved in most cases (86.66%), with a relatively low LSCS rate of 13.33%. Previous research suggests that severe anemia increases the risk of maternal complications such as postpartum hemorrhage, cardiac failure, and infections, but many women can still deliver vaginally with proper monitoring [14]. The fetal outcomes in our study are concerning preterm birth (47%), NICU admissions (41%), stillbirth/IUD (8.66%), and neonatal death (3%) are consistent with the known adverse impacts of severe maternal anemia [15]. Preterm birth and IUGR are particularly common due to chronic hypoxia and placental insufficiency, highlighting the urgent need for antenatal interventions to improve fetal growth and survival.

Overall, our findings reinforce the critical need for early detection, effective antenatal management, and timely intrapartum care to reduce both maternal and fetal morbidity and mortality associated with severe anemia.

Conclusion

Severe anemia remains a significant contributor to adverse maternal and fetal outcomes, with young, unbooked women being disproportionately affected. Improving antenatal care coverage, early identification of anemia, and appropriate management with iron therapy, nutritional counseling, and blood transfusion when necessary can significantly improve maternal and perinatal prognosis. There is an urgent need to strengthen public health interventions and ensure that all pregnant women, especially in rural areas, receive comprehensive antenatal care.

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