e-ISSN: 0975-9506, p-ISSN: 2961-6093

Available online on www.ijpqa.com

International Journal of Pharmaceutical Quality Assurance 2026; 17(7); 01-04

Original Research Article

Prevalence and Severity of Anemia Among Antenatal Women attending Tertiary Care Hospital: A Prospective Study

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Received: 06-05-2026 / Revised: 11-06-2026 / Accepted: 04-07-2026

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Conflict of interest: Nil

Abstract:

Background: Anaemia during pregnancy remains a major public health problem and is associated with adverse maternal and fetal outcomes, including fatigue, poor pregnancy tolerance, preterm birth, low birth weight, and increased perinatal morbidity. Its causes are multifactorial and commonly include iron deficiency, folate deficiency, vitamin B12 deficiency, poor dietary intake, short birth spacing, and socioeconomic factors.

Objective: The present study aims to assess the prevalence and severity of anaemia among antenatal women attending a tertiary care hospital and to evaluate associated haematological and nutritional parameters, including haemoglobin level, complete blood count, iron profile, serum ferritin, vitamin B12, and folate levels.

Materials and Methods: This prospective, observational, hospital-based study will be conducted in the Department of Obstetrics and Gynaecology, Phulo Jhano Medical College and Hospital, Dumka, Jharkhand, India, over a period of one year from January 2025 to December 2025. A total of 130 antenatal women diagnosed with anaemia during routine antenatal outpatient visits will be included. Anaemia will be classified according to World Health Organization criteria as mild, moderate, or severe based on haemoglobin concentration. Relevant demographic details, obstetric history, dietary pattern, symptoms, and laboratory findings will be collected using a structured questionnaire and clinical records. Data will be analysed using appropriate statistical methods, and a p-value of less than 0.05 will be considered statistically significant.

Conclusion: The study is expected to provide useful information regarding the burden, severity, and nutritional profile of anaemia among pregnant women attending a tertiary care hospital. The findings may help in planning early screening, targeted nutritional interventions, iron-folic acid supplementation, and improved antenatal care strategies to reduce anaemia-related maternal and fetal complications.

Keywords: Anaemia, Antenatal women, Pregnancy, Iron deficiency, Ferritin, Vitamin B12, Folate, Tertiary care hospital. DOI: 10.25258/ijpqa.17.7.1

Introduction

Anemia, a global public health concern, is especially common during pregnancy and is an important public health issue in developing and developed countries. It is etiologically multifactorial and geographically, economically, and nutritionally dependent. Complications can result in adverse outcomes in mother and fetus and cause high maternal and perinatal morbidity and mortality. Anemia is physiologically more susceptible in pregnant women due to rising iron requirements, plasma volume expansion, and changes in nutrient metabolism and thus, early diagnosis, and treatment are important for a favorable pregnancy outcome [1].

Iron deficiency is the most common cause of anemia in pregnancy and is generally responsible for iron deficiency anemia (IDA). The condition not only puts the health of the pregnant woman at risk but is also known to have a considerable effect on fetal development. IDA in pregnancy if untreated can go on

to produce adverse effects such as intrauterine growth restriction, preterm birth, low birth weight, and compromised neonatal iron stores [2,3]. Although it is suggested that iron deficiency in pregnant women is the cause of neonates with low iron status, there is little evidence to clearly establish such an association. It is shown in certain studies that iron acquisition by the fetus is independent of maternal iron status; however, such a process may still subject the fetus to suboptimal iron status with maternal stores reduced to severe deficiency [4].

Serum ferritin (SF) estimation is considered to be the most reliable biomarker of the body's iron stores and, when estimated in early pregnancy, can be a predictor of iron deficiency anemia [5]. Pregnancy anemia, however, is not due to iron deficiency alone. Other micronutrient deficiencies, most significantly folate and vitamin B12, are an integral part of its pathogenesis. Serum folate and vitamin B12 levels drop to nearly half their non-pregnant levels during pregnancy due to physiological changes like hemodilution, renal function changes, and hormonal changes [6]. These drops are also complemented by the increased metabolic demands of the pregnancy, particularly in the third trimester when the maternal folate turnover can be as high as 400 µg/day because of high cell division rates.

Short interpregnancy intervals — categorized as less than 6 months, 6–11 months, and 12–17 months — are associated with increased maternal folate depletion. Nutritional deficiency has negative implications in the subsequent pregnancy, increasing the risk for the defects of neural tube defects, preterm birth, and low birth weight [7]. Vitamin B12 deficiency is, however, relatively more prevalent in women who adhere to strict vegetarian diets for long durations because of the high concentration of the nutrient in animal-based foods. It is also a prevalent issue in most developing countries, where not only women of childbearing age but children as well present high rates of deficiency [8].

As many nutritional etiologic factors are interrelated, pregnancy anemia is etiologically multifactorial, and meticulous evaluation is needed. This is particularly so in the setting of tertiary-level care hospitals, as the patients represent a heterogeneous cross-section of socioeconomic and nutritional status. The integration of complete blood count (CBC) indices and biochemical parameters — namely, serum iron, ferritin, vitamin B12, and folate levels — yields a better and integrated profile of maternal hematological and nutritional status. These evaluations can guide targeted interventions, ultimately translating into improved maternal and neonatal outcomes.

The present retrospective study attempts to assess the prevalence and severity of anemia in antenatal women presenting to a tertiary care center. It also attempts to analyze the nutritional profile status by examining the serum iron profile, vitamin B12, and folate levels, thereby providing evidence-based recommendations for the preventive and therapeutic management of anemia in pregnancy.

Need for the Study: With no potential risks to life of paternity in this study we benefit by getting the data of anemia in pregnancy and will be able to manage anemia in pregnancy and to prevent its various consequences.

Materials and Methods

Study Design: This is a prospective, observational hospital-based study conducted to determine the prevalence and severity of anemia among antenatal women.

Study Area: The study will be carried out at the Department of Obstetrics and Gynecology, Phulo Jhano Medical College and Hospital, Dumka, Jharkhand, India, from a period of One year.

Study Duration: The study will be conducted over a period of One year from January 2025 to December 2025.

Sample Size: A total of 130 pregnant women diagnosed with anemia during their antenatal OPD visits will be included.

Study Population: The study population consisted of antenatal women attending the obstetrics outpatient department who will be found to be anemic during routine antenatal check-ups.

Data Collection: Investigations will be sent to clinical laboratory/SRL Laboratory, PJMCH Dumka.

Inclusion Criteria

- Pregnant women attending antenatal OPD.
- Diagnosed with anemia according to WHO criteria:
    - Mild anemia: Hemoglobin 9–11 g/dl
    - Moderate anemia: Hemoglobin 7–9 g/dl
    - Severe anemia: Hemoglobin <7 g/dl
- Availability of complete hematological and biochemical test reports.
- Those subject giving consent for study

Exclusion Criteria

- Non-pregnant women.
- Pregnant women without anemia.
- Patients with incomplete medical or laboratory records.
- Patients with known chronic illnesses (e.g., chronic kidney disease, malignancy) that could influence anemia status.
- Those subjects not giving consent for study.

Procedure/Collection of Data: All antenatal women who will give consent for study and attending outpatient department during the study period,

Blood investigation will be reviewed to find that were diagnosed with Anemia. All relevant demographic information, haemoglobin, concentration, complete blood count, iron profile, serum folate and vitamin B12 will be obtained from records. Cases will be classified and included mild, moderate and severe anaemia using WHO classification and criteria for epidemiological purposes. All obtained data will be safely compiled to a structured database for statistical analysis purpose.

Statistical Analysis: Data will be presented as mean ± standard deviation for continuous variables, and numbers and percentages for categorical variables. Statistical analysis will be performed using SPSS version 25 (IBM, Chicago, USA). The Chi-square test will be performed for categorical variables, and the T-test or ANOVA will be used for the continuous variables where appropriate. A p-value < 0.05 will be considered statistically significant.

Questionare

A. Identification Date

1.Participant ID

2.Dated Interview

3.Place-Hospital

4.Interviewers Name

B. Socio Demographic Information

1.Age

2.Address-Area (Urban/Rural)

3.Educational Status

1)Illiterate. 4)Higher Secondary

2) Primary. 5)Graduate

3) Secondary

4.Occupation

1) Housewife

2)Labourer

3)Service

4) Business

5)Others(Specify)

5.Husband-Occupation

6.Family income(Monthly)

7.Type of family

1)Nuclear

2)Joint

8.Religion

9.Dietary Habit

1)Vegetarian

2)

Non Vegetarian

C. Obstetrics history

1.Gravida(Total Pregnancies)

2.Parity (live birth)

3.Abortions

4.Current gestational age in weeks

5.Birth Spacing between last two Pregnancies

6.H/O heavy menstrual bleeding before pregnancy

1) Yes

2)No

7.Previous History of Anemia

1)Yes

2)No

8.Pregnancy blood transfusion

1)Yes

2)No

9.Any complications in Previous Pregnancy (eg Preterm, LBW, PPH)

D. Dietary &Nutritional History

1.Number of meals per day

2.Frequency of consumption of:

Green leafy vegetables

1)Daily

2)Weekly

3) Rarely

3.How often do you consume iron rich food (eg-red meat, legumes, spinach etc)

1) Daily

2) 2-3 times a week

3) Once a week

4) Rarely or never

E. Symptoms of anemia

Have you had such Complaints-

1)Fatigue or tiredness,

2)Dizziness or lightheadedness,

3)Shortness of breath,

4)Palpitations,

5)Pale skin or nails,

6)Headache,

7)Cold hand or feet

Diagnosis and treatment

Have you had a blood test to check for anaemia and pregnancy?

1)Yes

2)No.

If yes, what was the result of recent blood test?

1)Normal,

2)Mild anaemia

3)Moderate Anemia

4)Severe Anemia

Are you taking Iron Supplements:

1)Yes

2)No

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