

## A Study on Prevalence and Risk Factors of Anaemia among Pregnant Women Admitted in Antenatal Ward in a Tertiary Care Centre

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### Abstract:

**Background:** In underdeveloped nations like India, anaemia is one of the main causes of pregnancy-related illness and death, which ultimately has an impact on the foetus and the mother. A developing foetus is entirely dependent on its mother for development and maturity. In India, anaemia affects over 56% of women and is one of the nutritional deficient illnesses. It is among the causes of pregnancy-related foetal complications and maternal fatalities.

**Aim and objectives:** The objectives of this research were to evaluate the prevalence of anaemia and identify anaemia risk factors in expectant mothers at a tertiary care facility in Central India.

**Materials and Methods:** The Department of Obstetrics and Gynaecology at a Central India tertiary care facility carried out a descriptive cross-sectional research. 52 pregnant women made up the entire sample, and they were questioned using a self-structured questionnaire to gather data and classify anaemia based on the Indian Council of Medical Research's (ICMR) standards.

**Results:** After providing written informed permission, 52 expectant women were hospitalised and chosen as the research sample. The following is the prevalence of anaemia among expectant mothers: In the current study, 18 (32.62%) were mild, 05 (09.62%) were moderately, and 01 (01.92%) were severely anemic. According to the current study, the most prevalent indicators of anaemia in pregnant women were hookworm (28.84%), chronic malaria (17.30%), H/O infection (23.08%), and intervals between births (40.38%).

**Conclusion:** According to the report, anaemia has a high incidence rate of 44.2%. Pregnancy-related anaemia, which ultimately impacts the health of the mother and foetus, is significantly influenced by the time between pregnancy and H/O infection.

**Keywords:** Anemia; Iron Deficiency; Morbidity; Pregnant Females.

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### Introduction

Anaemia is a worldwide health concern that impacts both developed and developing countries. Over 1.62 billion people, or 24.8% of the world's population, suffer from anaemia, which is prevalent during pregnancy in roughly 74% of instances. Anaemia is 50.3% more prevalent in India, according to data from the National Family Health Survey 4 (NFHS 4). The burden is often higher in rural regions than in metropolitan ones. In addition to the mother's health, which includes maternal mortality and morbidity, anaemia during pregnancy affects the health of the unborn child, leading to low birthweight, premature delivery, and delayed brain development, all of which raise mortality and

morbidity. [1] One of the most prominent health issues in both industrialized and developing nations, anaemia impacts the health of both mothers and children.[2] Anaemia is defined by the World Health Organization (WHO) as a condition in which a pregnant woman's haemoglobin concentration is less than 10 gm/dl. Anaemia affects 1.62 billion people worldwide, with 56% of pregnant Indian women having the condition. [3,4] In Asia, the prevalence of anaemia in pregnant women varies from 37% to 75%. It is safe to suppose that haemoglobin levels below 6.5 g/dL are present in 2–7% of pregnant women. According to the World Bank, anaemia is the tenth most

significant risk factor for the illness in both women and teenage girls. Eighty percent of pregnant women in India suffer from anaemia brought on by an iron deficiency. Anaemia is one of the main causes of illness and death in most parts of the world. The health of the mother and the foetus are negatively impacted by anaemia during pregnancy. [4,5]

A number of variables, including a lack of education, low money, and illegal abortion, increase the risk of anaemia in India. In India, it ranks as the second most common cause of maternal fatalities.[6] Additionally, poor APGAR scores (less than 7) and an increased risk of birth asphyxia have been linked to anaemia.[7, 8] According to a recent meta-analysis, just 1gram/dl rise in haemoglobin concentration reduces the risk of maternal death by 20%. Therefore, treating anaemia during pregnancy has significant health consequences and would greatly improve the outcomes for both the mother and the foetus.[9]

The Indian Council of Medical Research (ICMR) recommends the following haemoglobin values to be used in the categorization of mild, moderate, and severe anaemia in pregnant women: Hb levels of 10.0–10.9 mg/dl indicate mild anaemia. Anaemia of moderate severity: Hb 7.0–10.0 mg/dl. Hb less than 7 mg/d indicates severe anaemia.

#### Aim and Objectives

The goals of this research were to evaluate the prevalence of anaemia and identify anaemia risk factors in expectant mothers at a tertiary care facility in Central India.

#### Materials and Methods

The Department of Obstetrics and Gynaecology at a Central India tertiary care facility carried out a descriptive cross-sectional research. The expectant moms were chosen for the study after taking into account the inclusion and exclusion criteria. The research sample gave them information about the study's goals and possible health benefits, which

ultimately assisted them in deciding whether or not to participate. 52 pregnant women made up the sample, and they were interviewed using a self-structured questionnaire to collect data. The Indian Council of Medical Research (ICMR) was used to classify the anaemia, and 23 of the mothers had mild, moderate, or severe anaemia. Self-structured instrument related to a variety of independent factors in the sociodemographic profile, including education, monthly family income, the number of prenatal visits, the time between pregnancies, and haemoglobin level. It also includes relevant variables such as iron intake, folic acid medications used during the current pregnancy, hookworm infection, and H/O malaria.

Laboratory reports were used to determine the haemoglobin outcome variable level. A pregnant woman was deemed anaemic if her haemoglobin level was less than 11 gm/dl. The Indian Council of Medical Research (ICMR) suggested other classifications of mild, moderate, and severe anaemia, which are as follows:

Hb 10.0 mg/dl–10.9 mg/dl is mild anaemia. Anaemia of moderate severity: Hb 7.0–10.0 mg/dl. A Hb level below 7 mg/dl indicates severe anaemia.

Frequency and percentage were used to convey the results of the compilation, tabulation, and classification processes used to analyze the data.

#### Results

52 pregnant women were chosen as a research sample from a total of 77 pregnant women who were hospitalized throughout this study period of time.

During the current research period, the incidence of anaemia rates was 18 (34.62%) mild, 05 (09.62%) moderate, and 01 (01.92%) severe. Out of 52 women, Table 1 displays the percentage distribution of women by their sociodemographic characteristics.

**Table 1: Socio-demographic variables**

Variables		Frequency (N)	Percentage (%)
Age groups	20-25 years	16	30.77
	26-30 years	12	23.08
	31-35 years	24	46.15
Residential area	Rural	30	57.69
	Urban	22	42.31
Educational level	Uneducated	32	61.54
	Educated	20	38.46
Type of family	Nuclear	24	46.15
	Joint	28	53.85
Employment status	Employed	16	30.77
	Unemployed	36	69.23
Socioeconomic status	46095-68961	04	07.69
	27654-46089	12	23.08

	9232-27648	24	46.15
	<9226	12	23.08
<b>Dietary habits</b>	Vegetarian	23	44.23
	Non-vegetarian	29	55.77
<b>Number of children</b>	None	17	32.69
	1	21	40.38
	≥2	14	26.93
<b>Gravida</b>	Primigravida	18	34.62
	Multigravida	34	65.38
<b>Parity</b>	Nullipara	01	01.92
	Primipara	24	46.15
	Multipara	27	51.93

The contributing factors to anaemia in pregnant women are included in Table 2.

**Table 2: Distribution of contributing factors of anaemia**

<b>Contributing factors</b>		<b>Frequency (N)</b>	<b>Percentage (%)</b>
<b>History of abortion</b>	No	32	61.54
	Yes	20	38.46
<b>History of infection</b>	No	40	76.92
	Yes	12	23.08
<b>History of chronic malaria</b>	No	43	82.69
	Yes	09	17.30
<b>History of hookworm</b>	No	37	71.15
	Yes	15	28.84
<b>Menstrual flow</b>	Low	15	28.84
	Moderate	33	63.46
	High	04	07.69
<b>Antenatal visits</b>	<4	21	40.38
	≥4	31	59.62
<b>Iron supplementation</b>	Yes	33	63.46
	No	19	36.54
<b>Previous h/o anemia</b>	Yes	18	34.62
	No	34	65.38
<b>Interval between birth (years)</b>	NA	19	36.54
	Yes	12	23.08
	No	21	40.38
<b>Number of previous pregnancies</b>	0	14	26.92
	1	21	40.38
	2-4	17	32.69
<b>BMI</b>	Underweight	06	11.54
	Normal weight	22	42.31
	Overweight	24	46.15
<b>Hb level</b>	Normal	28	53.85
	Mild	18	34.62
	Moderate	05	09.62
	Severe	01	01.92

## Discussion

One well-known public health concern that disproportionately impacts underdeveloped countries as opposed to developed ones is anaemia. Anaemia during pregnancy, in particular, can have an intergenerational cycle of anaemia, malnutrition, etc., along with other co-morbidities, and it has a detrimental effect on the health of the mother and the foetus. Anaemia is a severe worldwide public health issue that mostly impacts expectant mothers.

According to estimates from the World Health Organization (WHO), iron-deficiency anaemia causes 1,15,000 maternal deaths worldwide each year.[10] Prematurity, low birth weight, intrauterine growth restriction, and child mortality are examples of foetal problems.

Pregnancy-related anaemia is a serious public health issue in India, where 52.1% of pregnant women in rural regions and 45.7% of pregnant women in urban areas had haemoglobin levels

below 11 g/dl.[3] In India, anaemia is the primary cause or contributory factor in 20–40% of maternal fatalities. [11,12] Over 50% of children, adolescents, and expecting women suffer from anaemia, according to a report by the Indian Council of Medical Research.[13] A study conducted by Suryanarayana et al. found that 63% of pregnant women had it. The frequency of anaemia in this research was similar to that in ours (68.6%).[14] Anaemia was found in 64.2% of pregnant women in a rural Mysore region, and it was strongly correlated with age at first pregnancy, parity, and sociodemographic characteristics. Our study showed similar findings, although the time interval between pregnancies and ICDS service use was significantly correlated with haemoglobin status.[15]

The national family health survey data from rounds 2, 3, and 4 revealed that around 50 percent of pregnant females in India were anaemic, making India the South Asian country with the greatest prevalence of anaemia. The National Family Health Survey 4 of 2018 indicated elevated anaemia rates during pregnancy in several Indian states: 62.6% in Jharkhand, 58.3% in Bihar, 51.3% in Gujarat, 50.2% in Himachal Pradesh, 47.6% in Odisha, and 44.8% in Assam, in contrast to Kerala, Punjab, Himachal Pradesh, and Delhi. No significant or consistent reduction in the frequency of anaemia among pregnant women was noted across any states in NFHS 2, 3, and 4. [16,17]

Punjab has indicated that the risk factor for anaemia during pregnancy is directly linked to the number of parities a woman has, particularly when parity exceeds three and the interval between births is not much. 90.8% of anaemic women and 87.5% of those with a pregnancy spacing of less than one year experienced greater maternal anaemia compared to those with a birth gap exceeding three years and a history of chronic malaria. It is strongly advised that more effective instructions for educating girls, promoting knowledge of balanced diets, ensuring frequent prenatal exams, and advocating for consistent intake of iron-folic acid tablets be implemented at the grassroots level to achieve safe motherhood.[18,19]

The current study indicated that 44.23% of pregnant women are afflicted with anaemia. The attributes of variables, namely the risk factors for anaemia, are delineated by frequency and percentage distribution, which posits that: The primary indication for anaemia in pregnancy was identified as a history of abortion in 20 cases (38.46%). 12 individuals (23.08%) had a history of infection.

09 (17.30%) had a history of chronic malaria, 15 (28.84%) had a history of hookworm infection, 15 (28.84%) experienced poor menstrual flow, and 33

(63.46%) were classified as moderate. 04 (07.69%) were elevated, 21 (40.38%) attended less than 4 prenatal visits. 19 individuals (36.54%) were not consuming iron supplements, whereas 18 individuals (34.62%) had a prior history of anaemia. Twenty-one individuals (40.38%) had no birth interval. Six mothers (11.54%) were underweight (BMI < 18.9), 22 mothers (42.31%) had normal weight, and 24 mothers (46.15%) were overweight. Twenty-one individuals (40.38%) had a history of singleton pregnancies. Seventeen individuals (32.69%) had experienced 2 to 4 prior pregnancies. 18 (34.62%) had mild anemia, 5 patients (9.62%) had moderate anaemia, whereas one patient (1.92%) was severely anaemic.

### Conclusion

The most prevalent haematological condition during pregnancy is anaemia. Asian nations have one of the highest rates of anaemia worldwide, and it is linked to a number of factors, including low socioeconomic status, high parity, short birth intervals, inadequate diet in terms of both quantity and quality, a lack of knowledge about health and nutrition, and a high incidence of infectious diseases.

The results of the national family health survey show that while all of the efforts to lower the prevalence of anaemia in the nation are encouraging, they have not yet been successful in bringing the prevalence down below 50% in women and children. As a result, efforts must be strengthened and carried out further. A few key suggestions to lower the prevalence of anaemia in pregnancy from this study are as follows:

Regular prenatal visits and a screening program for girls starting in their adolescent age; Campaigns for widespread education and understanding of first-line prevention, including advice on eating a diet high in iron and recognizing anaemia signs early; Iron folic acid tablets distribution by the government to the isolated and mountainous areas; Strict monitoring of expectant mothers by a certified social health activist; Putting this approach into practice will significantly improve the health of the expectant woman during the prenatal, intranatal, and postnatal phases, which will ultimately result in a favourable outcome for the foetus.

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