A Cross Sectional Study on Anaemia Prevalence During Pregnancy

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Abstract:

Background:

Anaemia in pregnancy remains a major public health problem in India, contributing significantly to maternal and perinatal morbidity and mortality

Objectives:

To estimate the prevalence and severity of anaemia among pregnant women attending an obstetric clinic in Chennai and to study the association of anaemia with selected socio-demographic and obstetric factors.

Methods:

A hospital-based cross-sectional study was conducted during 2025–2026 among 370 pregnant women. Hemoglobin levels were obtained from antenatal records or estimated using standard laboratory methods. Anaemia was defined and classified according to World Health Organization criteria. Data were analyzed using SPSS software, and associations were tested using the Chi-square test, with a p-value <0.05 considered statistically significant.

Results:

The prevalence of anaemia was 43.8% (n=162). Anaemia was significantly associated with lower socio-economic status, lower educational level, higher parity, and non-consumption of IFA tablets (p<0.05).

Conclusion:

Strengthening nutrition education, improving IFA compliance, and addressing socio-economic determinants are essential to reduce the burden of anaemia and improve maternal health outcomes.

Anaemia, pregnancy, severity, risk factors

I INTRODUCTION:

Anemia during pregnancy is one of the most common nutritional deficiency disorders worldwide and continues to pose a major public health challenge, particularly in low- and middle-income countries. The World Health Organization (WHO) defines anemia in pregnancy as a hemoglobin concentration of less than 11 g/dL[1]. Iron deficiency remains the leading cause, attributed to increased iron requirements during pregnancy, inadequate dietary intake, and poor absorption[2]. Globally, it is estimated that nearly 36–38% of pregnant women are anemic, with the highest burden observed in South Asia[3].

India bears a disproportionate share of this burden, with anemia continuing to affect a significant proportion of antenatal women despite long-standing national nutrition programs. According to the National Family Health Survey-5 (NFHS-5, 2019–21), approximately 52% of pregnant women in India are anemic[4]. Anemia in pregnancy is associated with adverse maternal and fetal outcomes such as fatigue, increased susceptibility to infections, preterm labor, low birth weight, intrauterine growth restriction, and increased maternal morbidity and mortality[5]. Severe anemia can also contribute to postpartum hemorrhage and poor neonatal survival[6].

In Tamil Nadu, although maternal health indicators are relatively better compared to several other Indian states, anemia among pregnant women remains a significant concern. Studies conducted in both rural and urban areas of Tamil Nadu have reported prevalence rates ranging from 40% to 55% among antenatal women attending obstetric clinics[7],[8]. Factors such as low socio-economic status, inadequate spacing between pregnancies, poor compliance with iron-folic acid supplementation, and coexisting infections continue to contribute to the persistence of anemia[9].

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Estimating the prevalence of anemia among pregnant women attending obstetric clinics is essential to assess the current burden, identify at-risk groups, and strengthen existing maternal nutrition and anemia control strategies under national programs such as the National Iron Plus Initiative[10]. Such evidence is crucial for planning targeted interventions and improving maternal and perinatal health outcomes in Tamil Nadu.

II OBJECTIVES

- To determine the prevalence of anemia among pregnant women attending the obstetric clinic in a tertiary care hospital in Tamil Nadu.

- To assess the severity of anemia among the study participants.

- To study the association of anemia with selected socio-demographic and obstetric factors such as age, parity, gestational age, education, and iron–folic acid supplementation.

III METHODOLOGY:

This was a hospital-based cross-sectional study conducted in the obstetric outpatient clinic in Chennai during the period 2025–2026. The study population comprised pregnant women attending the obstetric clinic during the study period. All pregnant women who attended the obstetric outpatient clinic and provided informed written consent were included in the study. Pregnant women with known hemoglobinopathies, those suffering from chronic medical illnesses such as renal disease or malignancy, women who were seriously ill, and those unwilling to participate were excluded from the study.

The sample size was calculated using the standard formula for prevalence studies, n=4pq/d2n = 4pq/d^2 where p represents the prevalence of anemia among pregnant women, taken as 52% based on NFHS-5 data, q is 100 minus p (48%), and d is the allowable error, fixed at 10% of p (5.2). Based on this calculation and after rounding off, the final sample size was determined to be 370 pregnant women. A consecutive sampling method was adopted, and all eligible pregnant women attending the obstetric clinic were enrolled until the required sample size was achieved.

Data were collected using a pre-tested semi-structured questionnaire that captured information on socio-demographic characteristics, obstetric history, dietary habits, and iron–folic acid supplementation. Hemoglobin levels were obtained from antenatal records or estimated using standard laboratory methods. Anemia was defined as a hemoglobin level of less than 11 g/dL, and its severity was classified according to World Health Organization criteria as mild (10–10.9 g/dL), moderate (7–9.9 g/dL), and severe (<7 g/dL).

Data were entered into Microsoft Excel and analyzed using SPSS software version X. Results were expressed as frequencies and percentages, and the association between anemia and selected variables was assessed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant. Institutional Ethics Committee approval was obtained prior to the study, and informed consent was secured from all participants.

IV: RESULTS:

The prevalence of anaemia is around 43.8% (n=162). Anaemia was significantly associated with lower socio-economic status, lower educational level, higher parity, and non-consumption of iron–folic acid tablets
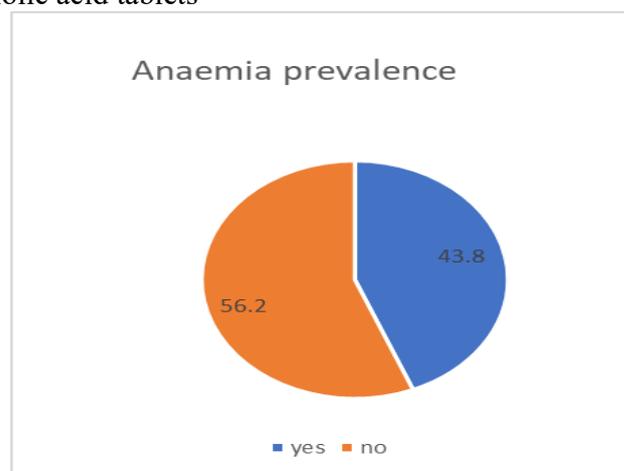

Fig.1: Prevalence of anaemia

Table 1: Severity of anaemia

Severity of anaemia	n	%
No anaemia	208	56.2
Mild anaemia	102	27.6
Moderate anaemia	56	15.1
Severe anaemia	4	1.1

Table 2: Bivariate analysis

Variable	Category	Anaemia present (N=162) n (%)	Anaemia absent (N=208) n (%)	p value
Age (years)	Mean ± SD	27.8 ± 3.32	28.01 ± 4.13	—
Socio-economic status	Upper	34 (21.0)	86 (41.3)	<0.001
	Middle	87 (53.7)	107 (51.4)	
	Lower	41 (25.3)	15 (7.2)	
Education	College	52 (32.1)	128 (61.5)	<0.001
	High school / Higher secondary	110 (67.9)	80 (38.5)	
Parity	Nulliparous	41 (25.3)	87 (41.8)	0.001
	≥1	121 (74.7)	121 (58.2)	
IFA intake	Yes	40 (24.7)	184 (88.5)	<0.001
	No	122 (75.3)	24 (11.5)	

V DISCUSSION:

In the present study, the prevalence of anaemia among pregnant women attending the obstetric clinic was found to be **43.8%**, indicating that anaemia continues to be a significant public health problem in pregnancy. This prevalence, although lower than the national average reported in NFHS-5, which estimates anaemia among pregnant women in India at around 52%, still represents a substantial burden requiring focused intervention[1],[2]. The relatively lower prevalence observed in this study may be attributed to better access to antenatal care services and iron supplementation in an urban setting like Chennai.

Regarding severity, **mild anaemia was the most common form (27.6%)**, followed by moderate anaemia (15.1%), while severe anaemia was observed in only 1.1% of participants. This pattern is consistent with findings from other hospital-based studies conducted in South India, where mild and moderate anaemia predominated and severe anaemia was relatively uncommon[3],[4]. Early antenatal registration and routine hemoglobin screening may explain the lower proportion of severe cases.

Socio-economic status showed a statistically significant association with anaemia, with higher prevalence among women belonging to the lower socio-economic class. This finding is in line with several studies that have demonstrated a strong link between poverty, poor nutritional intake, and increased risk of anaemia[5],[6]. Similarly, lower educational status was significantly associated with anaemia, suggesting that limited awareness regarding nutrition, antenatal care, and supplementation may contribute to poor maternal health outcomes.

Parity also showed a significant association, with higher prevalence of anaemia among multiparous women. Repeated pregnancies without adequate spacing can lead to depletion of iron stores, increasing the risk of anaemia, a finding corroborated by previous studies[7],[8]. One of the strongest associations observed in this study was with iron–folic acid (IFA) intake. Anaemia was significantly more prevalent among women who did not consume IFA tablets, emphasizing the critical role of supplementation in preventing and controlling anaemia during pregnancy[9].

Overall, the findings highlight that despite ongoing national programs such as the National Iron Plus Initiative, anaemia remains prevalent among pregnant women. Strengthening nutrition education, improving compliance with IFA supplementation, and addressing socio-economic determinants are essential to further reduce the burden of anaemia and improve maternal and fetal outcomes[10].

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