RESEARCH ARTICLE

A Prospective Observational Study on Prevalence and Incidence of Anemia Among Gestational Women

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Abstract

Objective: This observational study aims to determine the prevalence and incidence of anemia in pregnant women in the city of narsaraopeta, India.

Methods and Methodology: Information on a total of 130 pregnant women who attended ANC from September 2023 to February 2024 were taken. Information about age, parity, educational status, no. of abortions, type of family, socioeconomic factors, and dietary habits was collected by using pre-designed questionnaire and patient clinical data form. In this study, we used a simple randomized sampling technique to select subjects.

Results: The study encompassed 130 patients from government and private ANC (Antenatal Care) care hospitals in Narasaraopet over six months. Pregnant women were predominantly aged 19 to 23 (49.62%) and 24 to 28 (37.40%). The distribution based on trimesters revealed 23.26% in the first trimester, 36.43% in the second, and 36.43% in the third. Regarding previous delivery types, graduates constituted 24.43%, illiterates 31.30%, and primary education holders 44.27%. The distribution based on the severity of anemia showed variations across follow-ups, with a significant proportion in the moderate category. Additionally, the occupation-wise distribution depicted a high percentage of housewives (65.54%) and varied percentages among others.

Conclusion: Anemia prevalence is highest in the third trimester, persisting across follow-up periods, with a significant proportion in the 19-28 age group, highlighting challenges in managing anemia during pregnancy.

Keywords: Anemia, Hemoglobin, Antenatal care, Prevalence, Pregnant women, Occupation.

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Introduction

Anemia, a global health concern affecting 40% of the population, exhibits varying prevalence rates across regions, with significant occurrences in South East Asia, particularly in Bangladesh, India, and Indonesia. In India, prevalence fluctuates between 68.8 and 96% during pregnancy. Erythropoiesis, the process of blood formation, requires proteins, hormones, minerals, and vitamins, with iron playing a crucial role in hemoglobin synthesis. During pregnancy, iron absorption increases due to elevated estrogen levels, facilitating hemoglobin production to meet the demands of maternal and fetal growth. Despite adaptations, iron deficiency anemia persists, necessitating routine screening and supplementation during pregnancy. Factors affecting red blood cell production include nutritional deficiencies, bone marrow disorders, chronic diseases, increased destruction of red blood cells, blood loss, and impaired red blood cell function, prompting compensatory mechanisms such as increased erythropoietin production and hemoglobin-oxygen dissociation curve shifts to mitigate tissue hypoxia. Understanding these complexities is vital for the effective management of anemia, particularly in pregnant women, ensuring optimal maternal and fetal health.

Types of anemia during pregnancy:

During pregnancy, the patients are mainly affected by two types of anemia they are:

- Iron deficiency anemia
- Megaloblastic anemia

Iron deficiency anemia (IDA) is a prevalent condition during pregnancy, significantly impacting maternal and fetal health. Enhancers and inhibitors of iron absorption influence the body's iron status. Factors such as dietary intake, physiological changes, and pathological conditions affect iron absorption and loss.[1]

Megaloblastic anemia during pregnancy arises from disruptions in DNA replication due to folate or vitamin B12 deficiency. Folate deficiency can result from dietary insufficiency, malabsorption, hyperemesis gravidarum, or

drug effects, while vitamin B12 deficiency is primarily dietary or due to malabsorption.[1]

Types of anemia (WHO Classification)

- Mild anemia: Hb between 10 to 10.9 gm/dl
- Moderate anemia: Hb between 7.0 to 10.0 gm/dl
- Severe anemia: Hb <7.0 gm/dl[2]

Methodology

Study Design

A hospital-based Prospective Observational Study.

Study Site

This study was conducted at sri Venkateswara Maternity Care Hospital, Janirani Maternity Hospital & Narasaraopet Government Hospital Narasaraopet. The patients who visit this hospital are usually from in and around the districts of palanadu, Guntur, Prakashan

Study Period

This study was conducted over a period of 6 months.

Sample Size

A total of 130 subjects with anemia during the gestational period were included in the study. Those who fulfilled the exclusion and inclusion criteria were selected for the study.

Inclusion Criteria

- Anaemic patients who are in the gestational period.
- Consider the people who are above 20 to 55 years of age.
- Consider both inpatient and outpatient departments

Exclusion Criteria

- Participants or patients who did not want to give their information at the time of data collection.
- Participants or patients who are suffering from pseudocyesis and ovarian carcinoma.
- patients who are above 55 years.

Results

Distribution of pregnant women based on age

As shown in Table 1 distribution of pregnant women[3-5] based on age 19 to 23; 49.62% (n = 65), 24 to 28; 37.40% (n = 49), 29 to 33 8.40% (n = 11), 34-38 3.05% (n = 4), 44 to 48; 0.76% (n = 1), 49 to 53; 0.76% (n = 1).

Distribution of pregnant women based on trimester

Table 2 and Figure 1 shows distribution of pregnant women based on trimester. First trimester 23.26% (n = 30), second trimester 36.43% (n = 49), third trimester 36.43% (n = 52).[6-8]

Distrubution of pregnant women regarding to their previous delivery type

Figure 2 shows the distribution of pregnant women regarding to their previous delivery type: Graduates 24.43% (n = 32): cesarean 6.87% (n = 9), miscarriage 0.76% (n = 1),c normal 2.29% (n = 3), NVD 14.50% (n = 19); Illiteracy 31.30% (n = 41): cesarean 7.63% (n = 10), normal 4.58% (n = 6), NVD 19.08% (n = 25); Primary 44.27% (n = 58): cesarean 16.03% (n = 21), normal 3.82% (n = 5), NVD 24.43% (n = 32).

Table 1: Distribution of pregnant women based on age

Age	*No. of pregnant women*	*Percentage (%)*
19–23	65	49.62
24–28	49	37.40
29–33	11	8.40
34–38	4	3.05
44–48	1	0.76
49–53	1	0.76
Total	131	100.00

Table 2: Distribution of pregnant women based on trimester

Trimester	*No. of pregnant women*	*Percentage*
First trimester	30	23.26
Second trimester	49	36.43
Third trimester	52	36.43

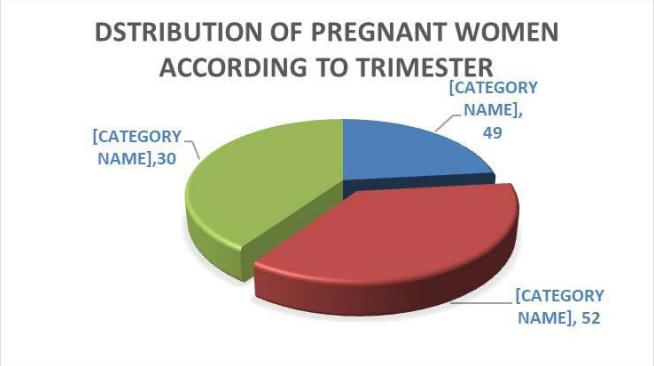

Figure 1: Distribution of pregnant women based on trimester

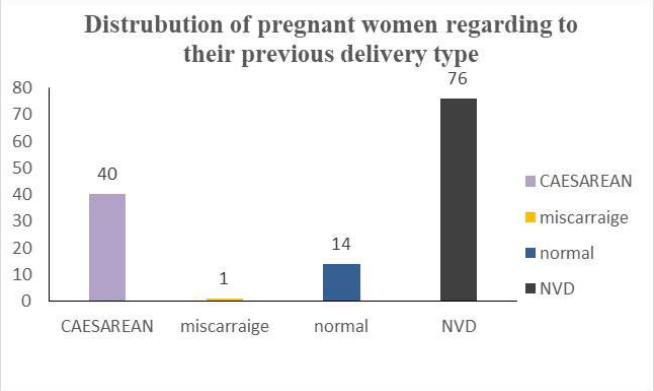

Figure 2: Distrubution of pregnant women regarding to their previous delivery type

Table 3: Distribution of pregnant women based on severity of anemia first follow-up

S. No.	Age	Severity	No. Of pregnant women
1.	19–28	Mild	21
		Moderate	89
		Severe	4
2.	29–38	Mild	5
		Moderate	10
		Severe	---
3.	39–50	Mild	1
		Moderate	---
		Severe	1

Table 4: Distrubution of pregnant women based on severity of anemia second follow-up

S. No.	Age	Severity	No. Of pregnant women
1.	19–28	Mild	28
		Moderate	83
		Severe	3
2.	29–38	Mild	5
		Moderate	10
		Severe	--
3.	39–50	Mild	1
		Moderate	--
		Severe	1

Table 5: Distrubution of pregnant women based on severity of anemia third follow-up

S. No.	Age	Severity	No. Of pregnant women
1.	19–28	Mild	34
		Moderate	80
		Severe	---
2.	29–38	Mild	5
		Moderate	10
		Severe	---
3.	39–50	Mild	1
		Moderate	---
		Severe	1

Table 6: Distrubution of pregnant women based on severity of anemia fourth follow-up

S. No.	Age	Severity	No. Of pregnant women
1.	19–28	Mild	44
		Moderate	70
		Severe	---
2.	29–38	Mild	5
		Moderate	10
		Severe	---
3.	39–50	Mild	1
		Moderate	--
		Severe	1

Table 7: Distrubution of pregnant women based on severity of anemia fifth follow-up

S. No.	Age	Severity	No. of pregnant women
1.	19–28	Mild	75
		Moderate	39
		Severe	---
2.	29–38	Mild	10
		Moderate	5
		Severe	---
3.	39–50	Mild	1
		Moderate	1
		Severe	---

Distribution of pregnant women based on severity of anemia: anemia first follow-up

Table 3 shows the distribution of pregnant women based on the severity of anemia.[4] Based on age 1st follow up 19–28: Mild (21), Moderate (89), Severe (4); 29–38: Mild (5), Moderate (10), Severe (0); 39–50: Mild (1), Moderate (0), Severe (1).

Distrubution of pregnant women based on the severity of anemia: second follow-up

Table 4 shows the distribution of pregnant women based on the severity of anemia. Based on age 2nd follow up 19-28: Mild(28), Moderate(83), Severe(3); 29 to 38: Mild (5), Moderate (10), Severe (0); 39 to 50: Mild (1), Moderate (0), Severe (1).

Distrubution of pregnant women based on severity of anemia third follow-up

Table 5 shows the distribution of pregnant women based on the severity of anemia. Based on age 3rd follow-up 19 to 28: Mild (34), Moderate (80), Severe (0); 29 to 38: Mild (5), Moderate (10), Severe (0); 39 to 50: Mild (1), Moderate (0), Severe (1).

Distrubution of pregnant women based on severity of anemia fourth follow-up

Table 6 shows the distribution of pregnant women based on severity of anemia. Based on age 4th follow-up 19 to 28: Mild (44), Moderate (70), Severe (0); 29 to 38: Mild (5), Moderate (10), Severe(0); 39 to 50: Mild (1), Moderate (0), Severe (1).

Distrubution of pregnant women based on severity of anemia fifth follow-up

Table 7 shows the distribution of pregnant women based on

Table 8: Distribution of pregnant women regarding type of family

Row labels	*Count of hemoglobin*	*Percentage*
≤4	101	77.10
≥4	30	22.90
Total	131	100.00

severity of anemia. Based on age 5th follow up 19 to 28: Mild (75), Moderate (39), Severe (0); 29 to 38: Mild (5), Moderate (10), Severe (0); 39 to 50: Mild (1), Moderate (0), Severe (1).

Distribution of Pregnant Women Regarding Type of Family

Table 8 shows the distribution of pregnant women regarding type of family.[5] Out of 131 no. of patients 77.10% (n = 101) had family members less than 4 and 22.90%(n = 30) had family members greater than or equal to 4.

Discussion

Age Distribution and Antenatal Care Seeking Behaviour: The data illustrate a predominantly younger pregnant population (aged 19-28), with declining proportions as age increases, indicating potential differences in fertility rates or antenatal care-seeking behaviour among older women.

Disparity in Delivery Mode Based on Education**: Normal deliveries are more common across all education levels, but illiterate and primary-educated women show a higher proportion of caesarean sections, suggesting disparities in delivery modes linked to educational status.

Trimester-wise Anemia Distribution: Anemia cases peak in the third trimester followed by the second trimester, underscoring the need for targeted interventions during these periods.

Education Level and History of Abortions: Higher rates of abortions among women with primary education compared to graduate education may signal differences in contraception access or socioeconomic factors influencing reproductive choices.

Prevalence and Persistence of Anemia: The data reveal a notable prevalence of anemia among pregnant women, persisting across multiple follow-up periods, suggesting challenges in managing and treating anemia effectively.

Family Size and Anemia Prevalence: Smaller family sizes correlate with higher anemia prevalence, possibly due to limited access to diverse and nutrient-rich diets.

Occupation and Anemia Susceptibility: Pregnant women in various occupations, including housewives, software professionals, workers, and employees, exhibit notable rates of anemia, highlighting the influence of occupation on susceptibility, possibly due to lifestyle factors or occupational hazards.

Conclusion

The Indian Council of Medical Research survey reports that 70% of pregnant women in India are anemic. Younger pregnant women show a higher tendency to seek antenatal care services, with a decline in representation beyond the age of 28, possibly indicating reduced fertility rates or decreased antenatal care-seeking behavior among older demographics. There's an apparent correlation between educational attainment and mode of delivery, with a higher proportion of cesarean sections among less educated women, suggesting disparities in healthcare access and knowledge impacting delivery choices. Lower education levels, particularly primary education, are associated with a higher history of abortions, highlighting the need for improved access to contraception and reproductive healthcare services. Anemia remains prevalent across different age groups and follow-up periods, necessitating sustained interventions and better access to iron supplementation and nutritional support. Various occupations, including housewives, software professionals, workers, and employees, exhibit notable rates of anemia, possibly influenced by sedentary lifestyles or workplace hazards, emphasizing the importance of workplace health initiatives.

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