

**“A STUDY ON PREVALENCE OF ANEMIA AMONG PREGNANT WOMEN  
ATTENDING ANTENATAL CLINIC AT RURAL HEALTH CENTRE (RHC) AND  
HOSPITAL, JABALPUR CITY, M.P.”**

**Abstract**

Anemia is the nutritional deficiency disorder and 56 % of all women living in developing countries are anemic (World Health Organization). It is the second most cause in India and 20% of total maternal deaths are due to anemia. To study the prevalence of anemia in rural pregnant women & study the factors associated with anemia. The study was conducted on pregnant women, attending the Maternity Clinic of Rural Health training Centre and teaching hospital of India. Study period is one year from 1<sup>st</sup> September 2021 to 07 September 2021. Anemia was classified as per the World Health Organization criteria. The Participants were 269, interviewed by using a pre- structured and pretested questionnaire. The study subjects age < 20 years to 30 and > 30 years. We have also observed the anemia in 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> trimester. Recently blood transfused, chronic renal disease and ante partum hemorrhage were excluded. The diagnosis of anemia was undertaken by peripheral blood smear examination and standard hemoglobin estimation by shale's method. Among 269 subjects, the prevalence of anemia is 58.36% including mild, moderate & severe anemia. Highly significant factors association was found with the mother's age, education, socio-economic status, parity and dietary habits. Other factors like family structure, size and attainment of menarche were not significantly associated with anemia. High prevalence of anemia (58.36%) indicates strict implementation of National Nutrition Anemia prophylaxis programme.

**Key Words:** Pregnancy, Anemia, Rural.

**INTRODUCTION**

Anemia during pregnancy is a major public health problem throughout the world, particularly the developing countries. Anemia refers to a condition in which the hemoglobin (Hb) content of the blood is lower than normal for a person's age, gender and environment, resulting in the oxygen carrying capacity of the blood being reduced. [1, 2] During the pregnancy plasma volume expands (maximum around 32 weeks) resulting in hemoglobin dilution. For this reason, hemoglobin level below 10gm/dl at any time during pregnancy is considered anemia. Hemoglobin level at below 9gm/dl requires detailed investigation and appropriate treatment. The main causes of

anemia in developing countries include: inadequate intake and poor absorption of iron, malaria, hookworm infestation, diarrhea, HIV/AIDS, genetic disorders (e.g., sickle cell anemia and thalassemia), blood loss during labor and closely spaced pregnancies. [1, 2] The pregnant women suffering from Iron deficiency anemia are with associated risk, born babies with low birth weight, preterm delivery, increased perinatal and neonatal mortality [3-5]. In another analysis, iron deficiency anemia (IDA) was an underlying risk factor for maternal and perinatal mortality and morbidity [6]. The ministry of Health, Government of India has recommended intake of 100mg of elemental iron with 500 mcg folic acid tablets in second half of the pregnancy for a period of at least 100 days. In the World Health Organization (WHO)/World Bank rankings, IDA is the third leading cause of disability adjusted life years lost for females aged 15-44 years [1, 7]. In 1993, the World Health Organization instituted its Safe Motherhood Initiative with a goal of reducing the number of maternal deaths by half before the year 2000 [8]. In India, anemia is the second most common cause and accounting for 20 % of total maternal deaths [9].

The prevalence of anemia ranges from 33 % to 89 % among pregnant women and is more than women from 60 % among adolescent girls with wide variations in different regions of the country [10]. The study shows that pregnant women in rural Maharashtra, one of the developed states of India registered a prevalence of anemia 56.4 % [11].

1970 National Nutritional Anemia Prophylaxis Programme (NNAPP) was initiated in India, with the aim to reduce the prevalence of anemia to 25 percent [12]. Since 1992, the daily dosage of elemental iron for prophylaxis and therapy has been increased to 100 mg and 200 mg, respectively under Child Survival and Safe Motherhood (CSSM) Programme. The present cross sectional study was designed to estimate the haemoglobin levels in pregnant women attending at Rural Health.

#### **Aims and objectives**

- To study the prevalence of anemia among pregnant women in RHTC and Hospital, Jabalpur.
- To study the various factors influencing among the anaemic groups.

#### **MATERIAL AND METHODS**

The Cross sectional study was conducted on the pregnant women attending in the Anti-natal Clinic in Rural Health Training Centre Annaram, and Obstetric clinic at teaching hospital. Total

sample of study subject was 269 pregnant women, interviewed by using 29 Pre designed and pre tested questionnaire, including prime gravida, second gravida and > second gravida. We have used purposive sampling technique to select the sample.

**Comment [U1]:** Is it a validated questionnaire?

### **Inclusion criteria**

The study subjects age of less than 20 years to 30 and > 30 years. We had also observed the anemia in 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> trimester.

### **Exclusion criteria**

In our study group recently blood transfused, who had chronic medical diseases, diagnosed haemoglobinopathies, and bleeding disorders or ante partum hemorrhage were excluded. The diagnosis of anemia was estimated by using the standard peripheral blood smear examination and shale's acid haematin method of hemoglobin estimation.

### **Study period**

1 year i.e.: from 1<sup>st</sup> September 2021 to 7<sup>th</sup> September 2021. Anemia was classified as per the World Health Organization (WHO) grading criteria is taken to be 11 g/dL. WHO further divides anemia in pregnancy in to mild anemia (hemoglobin 10-10.9 g/dl), moderate anemia (hemoglobin 7.0-9.9 g/dl) and severe anemia (hemoglobin <7 g/dL).

### **Data Collection Method**

Method of data collection includes selecting and development of tools. testing the validity and reliability and administering on few sample for data collection.

### **Selection of Tools**

Tools to the instruments used by the researcher to collect the data are mother's question and the attitude scale based on the objective of the study.

### **Development of the Tools**

Based on the objective of study, the structured knowledge question was prepared in order to associate the knowledge of antenatal mother.

Description of the tool consists of a structured knowledge questionnaire and 3-point attitude scale (Liker's type). It is divided into 3 parts are as follows.

**Part I:** It consists of demographic variable which includes are age group, educational status occupation family occupation, family income trilogy and type of family.

**Part II:** Questionnaire condoling 30 knowledge question. Regarding importance of knowledge of anemia at antenatal clinic, which is divided under 2 sections

### Pilot Study

Pilot study small scale version or trial was done for major study [9] after obtaining formal permission. The pilot study was conducted on 10 May 2021 to 17 May 2021 at Antinatal Clinical At Rural Health Centre, Jabalpur, Madhya Pradesh, India.

### Statistical analysis

Data were analyzed using SPSS version 17.0 and chi square test for categorical data were performed.  $P < 0.05$  was considered statistically significant.

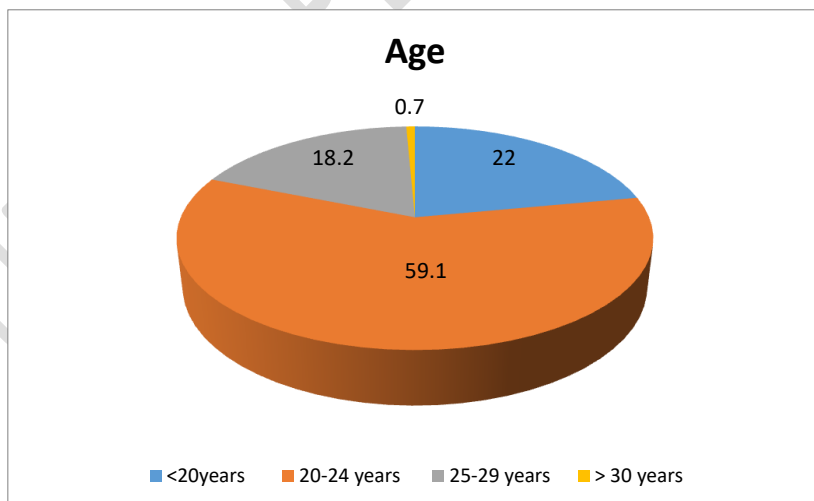
### RESULTS

The total study subjects were 269 pregnant women. Among them 157 pregnant women (58.36%) suffered with mild, moderate and severe anemia.

#### Section I

**Table 1: Distribution of participants according to age**

Age group	Number	Percentage (%)
<20years	59	22
20-24 years	159	59.1
25-29 years	49	18.2
$\geq 30$ years	2	0.7



**Fig. 1: Distribution of participants according to age**

Table 1 shows 77.3 % of pregnant women were 20-29 years of age group among participants. This result shows that Anti-Natal Cases majority are in the age group below 30 years.

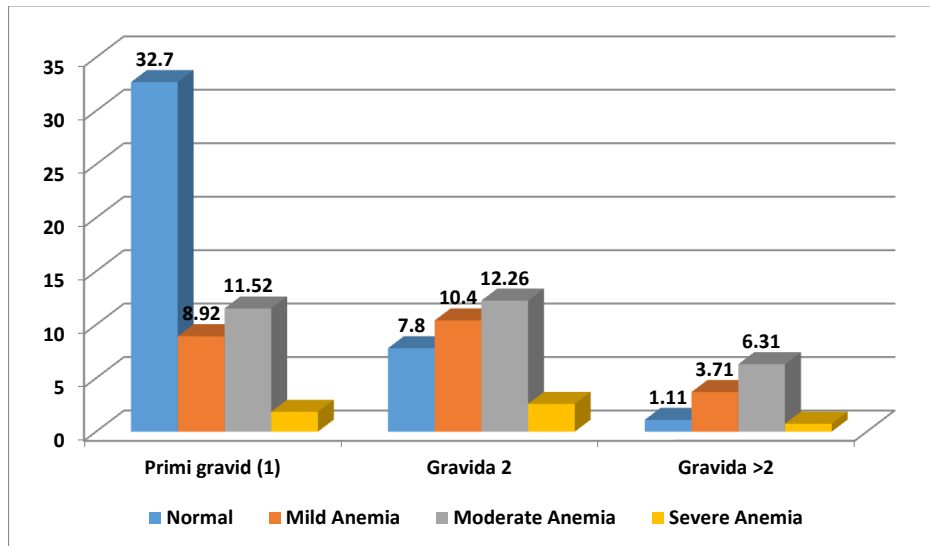
**Table 2: Distribution of Anemia in study group according to age, education & occupation**

Characteristics	Category	Severity of Anemia							
		Mild		Moderate		Severe		Total	
		N	%	N	%	N	%	N	%
Age Years	<20	18	11.4	23	14.6	3	1.9	44	28.0
	20-24	32	20.4	50	31.8	8	5.0	90	57.4
	25-29	12	7.6	8	5.0	3	1.9	23	14.6
	≥30	0	0	0	0	0	0	0	0.0
Education	Illiterate	32	20.3	35	22.2	6	3.8	73	46.4
	Primary School	9	5.7	25	15.9	3	1.9	37	23.6
	Secondary School	12	7.6	15	9.5	3	1.9	30	19.2
	Graduate /Pg	9	5.7	6	3.8	2	1.2	17	10.8
Occupation	Housewife./Agriculture/ Working Women	62	39.4	78	49.6	12	7.6	152	96.8
	Employed Women	0	0	3	1.9	2	1.3	5	3.2

Table 2 shows that high prevalence anemia (96.8 %) among housewife's and age cultural labors as compared with employees. Chi. square test 7.71 &  $P < 0.021$  (significant). Results indicate that agricultural labors and housewives were not utilizing the health care services which provide prophylaxis doses of iron & folic acid (100 days) for prevention of anemia.

**Table 3: Anemia Distribution among parity**

Parity	Normal N (%)	Mild Anemia N (%)	Moderate Anemia N (%)	Severe Anemia N (%)	Total Anemic N (%)
Primi gravid (1)	88 (32.7)	24(8.92)	31 (11.52)	5 (1.85)	60 (38.2)
Gravida 2	21 (7.80)	28 (10.40)	33 (12.26)	7 (2.60)	68 (43.3)
Gravida >2	3 (1.11)	10 (3.71)	17 (6.31)	2 (0.74)	29 (18.5)

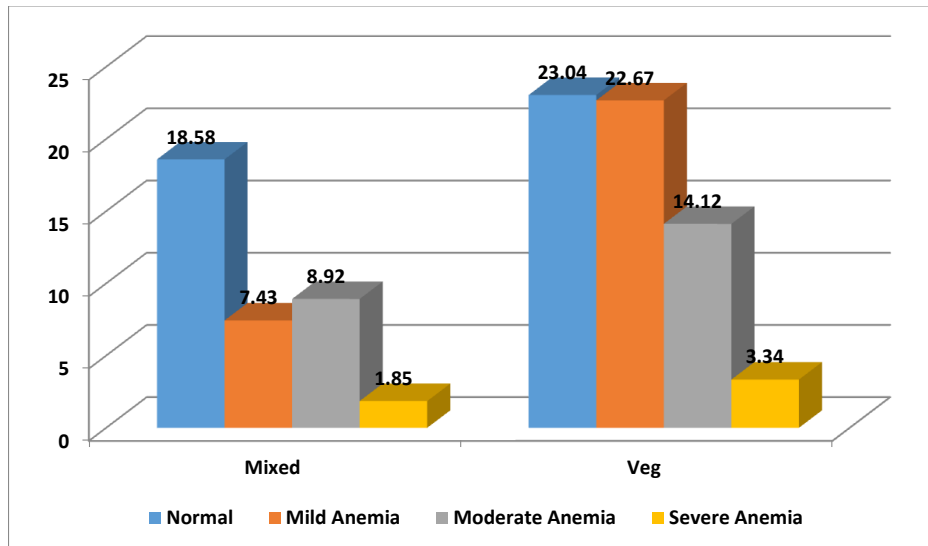


**Fig. 2: Anemia Distribution among parity**

Table 3 and Figure 2 showed that among the parity group second gravid majorities (43.3%) suffered with anemia. This shows that causes of anemia like close pregnancies, malnutrition, not taking prophylaxis doses of iron & folic acid tablets may be reason for high prevalence of anemia in second gravid.

**Table 4: Prevalence of anemia among vegetarian's & mixed diet**

Diet	Normal N (%)	Mild Anemia N (%)	Moderate Anemia N (%)	Severe Anemia N (%)	Total Anemic N (%)
Mixed	50 (18.58)	20 (7.43)	24 (8.92)	5 (1.85)	49 (18.21)
Veg.	62 (23.04)	61 (22.67)	38 (14.12)	9 (3.34)	108 (40.14)



**Fig. 3: Prevalence of anemia among vegetarian's & mixed diet.**

Table 4 and Figure 3 showed that vegetarian group suffered with high prevalence of anemia (40.14 %) as compared with mixed diet. Results showed that readily available iron absorbed better in mixed dietary groups.

#### **DISCUSSION**

The prevalence of anemia in pregnant women of RHTC & CAIMS Hospital was high (58.36 %) among the 269 study subjects of pregnant women. The similar study was done on pregnant women in rural Maharashtra; one of the developed states of India registered a prevalence of 56.4 % [10]. Similar reports from WHO shows that up to 56% of all women living in developing countries are anemic [17].

In India, National Family Health Survey 2 in 1998 to 99 shows that 54% of women in rural and 46% women in urban are anemic [18] The National Nutritional Anemia Prophylaxis Programme (NNAPP) was initiated in 1970 with the aim to reduce the prevalence of anemia to 25 percent [11].

Table 1 reveals that the maximum participant of pregnant women was in the age group of 20 to 29 years (77.3 %) at both RHTC & CAIMS Hospital. The similar study was conducted in Aurangabad city, India by Pushpa O Lokare, found that maximum (87.2 %) subjects were between ages above 20 to 30 years [21].

Table 2 shows anemia among age group 20 years to 29 years were in total 72.0% (mild 28.0 %, moderate 36.8 % severe 6.9 %). Among the education category, majority suffering with anemia were illiterates (46.4 %) as compared with other education levels, less in primary school (23.6 %), secondary school (19.2 %) and graduates/ PG's (10.8 %).

The similar study done in 7 states by K. N. Agarwal, D. K. Agarwal and group of health care & Research Association revealed that the anemia in illiterates (those who neither read nor write) among pregnant women was highest in M.P (68.0 %) followed by 46.3 %, 45.3 %, 30.7 % 28.7 %, 8.8 % and 1.3 % in the states of Orissa, Assam, Haryana, Tamilnadu, H. P. and Kerala, respectively. The similar study done by Pushpa and all revealed that proportion of pregnant women suffering from anemia were 96.4 %, 94.8 %, 92.1 % and 91.5 % among illiterates, those educated up to primary, middle school and high school respectively. It was found that the lower the educational level of women, the probability of suffering from anemia during pregnancy.<sup>21</sup>

Among occupation category, shows that the high prevalence of (96.8 %) anemia among housewives and agricultural labours as compared with employees (3.2 %) was anemic. The similar study shows that the proportion of pregnant women suffering from anemia in classes I and II were less (47.61 % and 71.42 %, respectively) as compared with the lower socioeconomic status (93.51 %, 94.49 %, and 94.11 % in classes III-V, respectively). It was obvious that as the socio economic status decreased, the prevalence of anemia increased. **This association between the socioeconomic status of the family and anemia in pregnancy was found to be statistically significant ( $P < 0.05$ ) [21].**

Table 3 shows, higher prevalence of anemia (43.9 %) seen in second gravid and 25.7 % 2 trimester pregnant women. The same explanation was given by similar study, with the mean gestational age at booking of 22 weeks in this study; physiologic haemo dilution in pregnancy may explain the increased prevalence of mild anemia [17].

Women who receive daily antenatal iron supplementation are less likely to have iron deficiency anemia at term [19]. Even two injection of iron dextran (250 mg each) given intramuscularly at 4 week intervals along with tetanus toxoid injection have been recommended for better compliance and adequate results [20].

Table 4 shows that dietary habits have influence on anemia. The vegetarian group of pregnant women were maximum (40.14 %) with anemia as compared with having mixed dietary habits



(18.21 %). In similar study by Baig Ansary N, Badruddin SH it was stated in the literature that tea consumption and low intake of red meat were associated with anaemia [23].

Meat is a good source of high quality protein, iron, zinc and all the B vitamins except folic acid. Meat consumption reported to be 21 kg/ capita/ year for Turkey, 124 kg/capita/year for USA and 100 kg/capita in European countries [24]. These data explains the lower anaemia prevalence among those developed countries.

### **CONCLUSION**

A very high prevalence of anemia (58.36 %) in pregnant women is an indicator of the failure of national and WHO programmes to address this problem. Shift in the programme to mandatory regular supply of IFA tablets to adolescent girls and pregnant women from 24 week onwards till 12 weeks of postpartum period. We have to rectify the nutritional deficiencies with Food fortification and timely interventions for reducing the burden of the malaria, worm infestations and other infectious diseases. All practitioners handling obstetrics cases should be motivated for prescribing iron preparations and balanced diet with good compliance.

### **REFERENCES**

1. Karine Tolentino, Jennifer F. Friedman. An Update on Anemia in Less Developed Countries. *A M J Med Hyg.* 2007;77:44-51.
2. World Health Organization. Iron Deficiency Anemia: Assessment, Prevention and Control. Geneva, World Health Organization 2001.
3. Scholl T, Hediger M, Fischer R, Shearer J. Anemia vs. Iron deficiency: increased risk of preterm delivery in a prospective study. *Am J Clin Nutr.* 1992;55:985-8.
4. Roy S, Chakravorty PS. Maternal and perinatal outcome in severe anaemia. *J Obstet Gynaec India.* 1992;42:743-50.
5. Rangnekar AG, Darbari R. Foetal outcome in anaemia during pregnancy. *J Obstet Gynaec India.* 1993;43:172-6.
6. Stoltzfus, Mullany and Black. Iron Deficiency Anemia, "Comparative quantification of health risks: Global and regional burden of disease attributable to selected major risk factors," WHO 2004.
7. Yip R, Ramakrishnan U. Experiences and challenges in developing countries. *J Nutr.* 2002;132:827S-30S.

8. DeMaeyer EM, Dallman P, Gurney JM, Hallberg L, Sood SK, Srikantia SG. Preventing and controlling iron deficiency anemia through primary health care: a guide for health administrators and programme managers. Geneva, Switzerland: World Health Organization, 1989.
9. Govt. of India. Health information of India, 1995, DGHS, Nirmal Bhawan, New Delhi.
10. Fred Arnold, Sulabha Parasuraman, P. Arokiasamy, Monica Kothari. 2009. Nutrition in India. National Family Health Survey (NFHS-3), India, 2005-06. Mumbai: International Institute for Population Sciences; Calverton, Maryland, USA: ICF Macro.
11. Agarwal DK, Agarwal KN, Roychaudhary S. Targets in National Anemia prophylaxis Programme for pregnant women. *Indian Paediatr.* 1988;25:319-22.
12. DeMaeyer EM, Dallman P, Gurney JM, Hallberg L, Sood SK, Srikantia SG. Preventing and controlling iron deficiency anaemia through primary health care, WHO, Geneva, 1989.
13. Firkin F, Chesterman C, Penington D, Rush B. DeGruchy's Clinical Haematology in Medical Practice, Oxford University Press, 5th edition 1990, P31.
14. The text book of Preventive and Social Medicine. In: Mahajan, Gupta, editors. 3ed. 2003; 117-8.
15. Economic Survey 2000-2001. Govt. of India, Ministry of Finance, Economic Division.
16. Virender PG, Yogesh B, Taneja DK, Renuka S. Prevalence of anaemia amongst women and its sociodemographic. *IJCM.* 2002;27:4.
17. World Health Organization. The prevalence of anemia in women; a tabulation of available information; second edition Geneva WHO; 1992 (WHO/MCH/MSM/92.2).
18. Kennedy E. Dietary reform intakes; development and uses for assessment of micronutrient status of women- a global prospective. *Am J Clin Nutr.* 2005;81:1194-S7S.
19. Bhatt RV. Poor iron compliance the way out. *J Obstet Gynecol India.* 1997;47:185-190.
20. Pena Rosas J, Viteri F. Effect of routine oral supplementation with or without folic acid for women during pregnancy. *Cochrane Database syst Rev.* 2006;19:3;CD004736.
21. Pushpa O Lokare, Vinod D Karajekar, Prakash L Gattani, Ashok P Kulakarni. A study of prevalence of anemia and socio demographic factors associated with anaemia among pregnant women in Aurangabad city, India. 2012;6:30-34.

22. Agarwal KN, Agarwal DK, Sharma, Sharma AK, Prasad K, Kalita MC, Khetarpaul N, Kapoor AC, Vijayalakshmi L, Govilla AK, Panda SM, Kumari P. Prevalence of anaemia in pre-nant and lactating women in India. *Indian J Med Res.* 2006;124:173-184.
23. Baig Ansary N, Badruddin SH, Karmaliani R, Harish H, Jehan I, Pasha O, Moss N, McClure EM, Golden berg RL. Anemia prevalence and risk factors in pregnant women in a urban area of pakisthan. *Food Nutr Bull.* 2008; 29:
24. Speedyp AW, Global production and consumption of animal source foods. *J Nutr.* 2003;133:4048-4053.

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