



## A COMPARATIVE STUDY OF PREVALENCE OF IRON DEFICIENCY ANAEMIA IN ANTENATAL WOMEN FROM URBAN AND RURAL AREA OF PUNE, INDIA

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## ABSTRACT

**Introduction:** Iron deficiency anaemia (IDA) is the most common nutritional deficiency in pregnant women. The study was conducted to study the prevalence of iron deficiency anaemia in the antenatal women of urban and rural areas and to identify some risk factors of iron deficiency anaemia and its association with IDA.

**Material & Methods:** A cross sectional study was conducted in urban and rural health training centres of a medical college in Pune. The antenatal women were the study subjects. A total of 180 ANC cases were recruited and studies from both the field practice area attending the outpatient clinics. Sociodemographic profile was recorded & anaemia was assessed using recently done haemoglobin reports in the present pregnancy. The study duration was 6 months. GCP and ethical guidelines were followed as advised for human studies.

**Results:** The prevalence of IDA in the study population was 66%. (rural=81%, urban=51%). IDA prevalence was 54% in primigravida and the prevalence increased as gravid status increased. Iron deficiency anaemia was seen statistically significantly associated with residence, illiteracy, type of diet, and gravida status of the pregnant women.

**Conclusion:** IDA has strong relation with residence (urban/rural), literacy level, social status, monthly income and dietary habits.

**Key Words:** anaemia, haemoglobin, morbidity.

## INTRODUCTION

India has always been a country with a high prevalence of anaemia. In India, prevalence ranges between 33-89 per cent<sup>1</sup>. Indian obstetricians and nutrition scientists earlier documented that pregnant women were the most vulnerable group for anaemia. Iron deficiency anaemia (IDA) is the most common nutritional deficiency in pregnant women. The increased iron requirement in pregnancy and puerperium lead to an increased susceptibility to iron deficiency anaemia. According to WHO, the prevalence of IDA is about 18 per cent in developed countries and 35-75 per cent (average 56%) in developing countries<sup>2</sup>. It is linked to ad-

verse pregnancy outcomes including preterm delivery and intrauterine growth retardation. It is associated with various maternal morbidities like fatigue and postpartum depression & increased maternal mortality. About half of the global maternal deaths due to anaemia occur in South Asian countries; India contributes to about 80 per cent of this mortality ratio<sup>3</sup>. A study conducted by ICMR<sup>4</sup> showed that the prevalence of mild anaemia was highest among pregnant women (50-90%) and also severe forms of anaemia was persistently high. Prevalence was high in all States of the country with considerable variations in moderate to severe anaemia. NFHS 3 showed the differences in the prevalence of anaemia in the rural & urban ar-

eas as well.<sup>5</sup> This fact has been proven by studies done across various states in India<sup>6-8</sup>. The various factors responsible for high prevalence of IDA in rural area are factors like poverty, illiteracy, affordability and availability of health care facilities, more male bias for food leading to deprivation of females for protein and iron rich food. All this leads to increased parasitic and other infections leading to more anaemic state and a resultant vicious cycle of malnutrition<sup>9</sup>.

Many programmes have been introduced and implemented to reduce the burden of anaemia in the country but the decrease is lower than other South Asian countries<sup>6</sup>. Reproductive & child health program (RCH) is one such national health program that caters to all the needs of the pregnant females throughout the country. It has special focus on controlling and preventing anaemia in pregnancy by doing haemoglobin estimation and providing iron tablets to all the pregnant women.

The medical colleges provide their services in adopted rural and urban communities for various health issues and support national programs including RCH. There is dearth of local studies on the same subject. With this background a study was planned and the objectives of the study were to assess the prevalence of anaemia in antenatal women from urban & rural field practise areas of a medical college in Pune and to find out if there is any association of anaemia with some socio-demographic variables.

## MATERIAL & METHODS

After institutional ethical approval a cross sectional study was planned at the urban & rural field practise areas of medical college in pune. The study subjects were antenatal women attending the outpatient clinics from these areas. Each field practise area has one outpatient clinic with obstetric specialist visiting these clinics once a week on separate days allotted for the antenatal care services. The females attending the clinic on these separate days were approached and screened for their eligibility for the study. The inclusion criteria for the study were antenatal women with their haemoglobin report and willingness to participate in the study. The ANC study subjects were tested for hemoglobin reports at the laboratory of rural and urban health centers by the respective laboratory technicians by the Sahlis method. The laboratory technicians were trained in the standardised testing and all the study subjects were evaluated by respective technician at both the centers by the same Sahlis method which has been followed for all the women who get registered and seek treatment. This method of hemoglobin estimation has been

standardised and used under the program for testing of hemoglobin under RCH program. The study period was from January 2013 up to June 2013. The tool for data collection was a semi structured questionnaire. It had two parts with the first part pertaining to socio demographic history and second part pertaining to the antenatal care service utilization and examination.

WHO criteria to define anaemia is haemoglobin (Hb) <11 g %<sup>2</sup> and the ICMR classification of iron deficiency anaemia is: 8-11 g% as mild, 5-8 g % as moderate and <5 g% as severe anaemia<sup>4</sup>. These definitions were used to classify and grade the subjects for anaemia. The study subjects were evaluated for the standard routine antenatal care and its service utilization. The haemoglobin report done in the present pregnancy was used to categorise the study subjects. Prevalence of anaemia was expressed in percentage & Chi square test was used as a test of significance. P value of 0.05 and less was considered as statistically significant. Epi info software 7.1.2.0 was used for statistical analysis.

## RESULTS

In the present study a total of 180 subjects participated & were interviewed with 116 from urban area and 64 from the rural area. The overall prevalence of anaemia in the study subjects is 66.6% with prevalence in rural study subjects was found to be 81% and among the urban study subjects it was 51%. The mean Hb % in the urban area was found to be 10.8 gm % & in the rural area it was 9.6 gm %.

**Table 1: Grades of Anaemia\* In Study Subjects**

Grades of anemia	Haemoglobin (gm/dl)	Anaemic patients (n=120) (%)
Mild	8 to 11	82 (68.3)
Moderate	5 to 8	32 (26.7)
Severe	<5	6 (5.0)

\*\* WHO criteria for anemia

**Table 2: Gravidawise Anaemia Prevalence in Study Subjects**

Gravida	Anemic (n=120)	Non anemic (n=60)	Total (%)*
1	54	46	100(54.0)
2	44	14	58(76.3)
3	18	0	18(100)
4	4	0	4(100)

\* = percentages are calculated gravidawise i.e. row total

Table 1 shows the grade wise prevalence of anaemia in study subjects wherein the mild cases (68%) are clearly in excess of moderate (27%) and severe (5%) cases.

Table 2 shows that as gravida status of study subjects goes on increasing from primi to multi the anaemia prevalence goes on increasing up to 100%.

Table 3 shows the association of anaemia with rural area, multi gravid status, illiteracy, vegetarian diet and less than 3 meals per day as statistically significantly.

**Table 3 : Association Of Socio-Demographic Variables and Anaemia**

Correlates	Anemic (n=120) (%)	Non Anemic (n=60) (%)	P Value
Rural	52 (43.3)	12 (20)	0.004
Urban	68 (56.7)	48 (80)	
Multigravida	66 (55)	14 (23.3)	<0.001
Primigravida	54 (45)	46 (76.7)	
Illiterate	74 (61.7)	10 (16.7)	<0.0001
Literate	46 (38.3)	50 (83.3)	
Meals <3/Day	80 (66.7)	18 (30)	<0.0001
Meals ≥3/Day	40 (33.3)	42 (70)	
Veg Diet	52 (43.3)	10 (16.7)	<0.001
Mixed Diet	68 (56.7)	50 (83.3)	

## DISCUSSION

In this study it was observed that in pregnant women overall prevalence of anemia was 66.7%. Important contributing factors responsible for high incidence of anaemia in our country include early marriage, teenage pregnancy, multiple pregnancies, less birth spacing, phytate rich Indian diet, low iron and folic acid intake and high incidence of worm infections in Indian population<sup>10</sup>. Similar higher level of prevalence was seen in other studies also<sup>3, 12-14</sup>.

However, lower prevalence of anaemia was reported by few studies in India<sup>15</sup>. The reasons for this finding could be difference of study timings and study settings.

As the number of pregnancies increase the risk of anaemia & its severity goes on increasing, if adequate preventive care is not taken. This study also shows the same result. As shown in table 3, in first gravida prevalence is 54%, in second gravida it is 76% , in third gravida & fourth gravida it is 100%. The reason for this finding could be frequent pregnancies & lack of optimum spacing between two births leads to exhaustion of already scarce iron stores. This leads to anaemia of increasing severity as the stores are not replaced in due course. Earlier starting of iron supplementation seems to be the most important strategy. Similar observations were seen by other investigators<sup>16-18</sup>.

In this study the prevalence of anemia was much more in women belonging to rural areas (81%) as compared to urban areas (51%). The various plausible reasons for this finding could be less igno-

rance, poverty, lack of health care facilities, poor utilization of health care services etc. Similar observations has been documented by NHFS 3<sup>5</sup>.

In this study it was observed that the prevalence of anemia was more in individuals belonging to low socio-economic status group, poorly nourished group and individuals who were illiterate. This inverse relationship of educational status & socio-economic status with anaemia has been proven by many studies across the globe. These factors stress the importance of timely health education to adolescent girls and married women on issues like importance of literacy, delaying the age at marriage, family spacing, small family norm etc. Similar findings were seen by other investigators also<sup>12,16,18</sup>.

This study shows significant relationship of anaemia with vegetarian diet and calorie intake as determined mainly by number of meals taken. In India mostly females don't take any other foods other than cereal based food. It is major factor for high prevalence of anaemia and this is particularly more in pregnant women of low socio-economic status & poor nourished women. Although dietary habits were not studied in detail but it is likely that individuals in these groups take nutritionally deficient diet.

## CONCLUSION

To conclude it has been proved by the results of this study that anaemia has strong relation with residence (urban/rural), literacy level, social status, monthly income and dietary habits. However more studies are needed to support this observation. The limitation of this study is that it was done on a smaller sample size and was not designed specifically to study all the risk factors for anaemia in this population. There is a need for further exploration on this topic.

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