



## PREVALENCE OF ANEMIA IN PREGNANT WOMEN OF CENTRAL INDIA

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### Abstract:

**BACKGROUND:** Pregnancy is a marvellous anabolic process in which a healthy kid is born in nine months from food, vitamins, minerals, and hormones. The foetus functions like a parasite on the mother, sucking nutrients from her meals. Nutrition is a set of processes through which moms get and use the materials they need to sustain their component's function, growth, and renewal. If the mother's diet is inadequate, her body reserves are drained and exhausted. To meet the needs of the developing foetus, the maternal system must undergo significant changes in the uterus, fallopian tubes, vagina, breast volume, blood composition, serum proteins, weight changes, basal metabolic rate, respiratory system, elementary functions, skeleton, skin, teeth, urinary system, nervous system, and endocrine system, among other things. Nutrition science identifies the types and amounts of foods that enhance health and well-being.

**AIM:** To study the Prevalence of Anaemia in Pregnant Rural Women of Central India.

**MATERIAL AND METHOD:** Aiming at the vulnerable situation of rural pregnant women, the present study on "Prevalence of Anaemia, in pregnant rural women of Central India" district in Maharashtra was launched, and conducted. One hundred pregnant women in 20- 45 yrs of age group were identified. Out of which three were excluded as two of them were migrated to their parental house and one was the case of miscarriage.

**RESULTS:** The nutritional intake of responders was found to be much lower than the RDA standards. Total calorie, protein, iron, and folic acid deficiencies were discovered in pregnant women's diets. Protein, iron, and folic acid needs were only met in a few cases. It is worth mentioning that the entire anaemic population was under the influence of microcytic anaemia (iron deficiency anaemia), no any case of megaloblastic or other type of anaemia came into existence. Therefore, this melody can be overcome by nutritional management. Age of respondents, their food habits and family income have highly significant role in avoiding and curing anaemic condition. Advancing age of poorly fed women is directly associated to develop anaemic condition. However vegetarians were more susceptible for anemia as compared to non vegetarians. This difference was highly significant. These differences are indicative that the anaemia advances with the advancement of pregnancy and reducing values of MCV indicate that this anaemia is microcytic type and not megaloblastic type.

**CONCLUSION:** As a result, a multi-media approach to nutrition and health education should be prioritised. Agriculture extension and home-science extension staff should assist rural women to build nutrition gardens and disseminate low-cost nutritious Suits, vegetables, and other foods for consumption in remote homes. Iron and folic acid tablets should be given to pregnant women as a source of additional nourishment. Access to safe and nutritious food is critical for maintaining a healthy and active lifestyle. In order to ensure the household's food security, the family's purchasing power should be boosted through various income-generating strategies.

**KEYWORDS:** Hb, IDA, NNAPP, MCV, MCH, MCHC.

### Introduction:

Low iron level causes anaemia, which is a shortage in the oxygen-carrying component of the blood. Robinson & Lowler described the term anaemia as biochemical lowered haemoglobin level, number of red blood cells & haematocrit resulting diminished oxygen carrying capacity of the blood.<sup>1</sup> Anaemia is described as a drop in the mass of circulating haemoglobin (Hb) below a certain threshold. In healthy pregnant women, the typical haemoglobin content in the body is between 12-14 gm/dl, according to the World Health Organization. As a result, in pregnancy, any haemoglobin level below 11 gm/dl should be considered anaemia. In India and most other poor countries, however, the lowest limit is commonly accepted as 10 gm/dl.<sup>2</sup>

One of the most common dietary deficits among pregnant women around the world is iron deficiency anaemia (IDA). Anemia affects roughly half of all pregnant women, according to the World Health Organization (WHO).<sup>3</sup> IDA has also been linked to maternal death, children's poor cognitive development, and the mother's diminished job capability. In India, anaemia is still a leading cause of maternal death, accounting for more than 20% of all maternal deaths. The high incidence of anaemia and its negative health implications are very frequent in our country as a result of poor dietary intake of iron and folate. To prevent anaemia in pregnant women and children, India was the first developing country to implement a National Nutritional Anaemia Prophylaxis Program (NNAPP). For the past three decades, anaemia screening and iron-folate therapy in adequate dosages have been required components of antenatal and paediatric care, yet coverage of these programmes is extremely poor. As a result, pregnant women continue to have extremely high rates of anaemia, and maternal mortality stays unchanged. Anaemia is still a big disease that affects people from all walks of life, and it has had negative consequences. Several studies have also revealed that iron deficiency anaemia is the most common type of anaemia during pregnancy.<sup>4</sup>

Women's nutrition and health are important for the quality of their lives as well as the survival and healthy development of their neonates; however, this area has received relatively little attention; further, women should not be thought of solely in terms of their reproductive roles as mothers; adequate

nutrition is a human right for all, and the nutritional benefits to women's social and economic capabilities should be viewed as major goals. Unfortunately, pregnant women's nutrition in rural areas is a neglected field of study. There is a paucity of research on the health and nutrition of rural pregnant women. As a result, the purpose of this study is to learn about the nutritional status and prevalence of anaemia among rural women in the reproductive age group (15-45 years). What is more, anaemia in pregnancy is not just a continuation of the generally anemic condition of Indian women. A study in rural Maharashtra found that almost half of a group of pregnant women who are not anemic early in their pregnancies have become anemic three months later, indicating that their anaemia was either caused or precipitated by their pregnancies.<sup>5</sup>

The overall nutritional status has definitely improved during last few decades. Monitoring Bureau (NNMB) on the prevalence of micro nutrient deficiency indicates prevalence of anaemia was highest (78%) among lactating women followed by pregnant women with 75%.<sup>6</sup> It is a matter of concern that anaemia constitute to take a heavy toll of life of pregnant women inspite of two decade of operation of National Nutrition Anaemia Control Programme. A recent evaluation of programme by ICMR has shown that it has not made any noticeable impact on the prevalence of anaemia.

### MATERIAL AND METHODS

Hundred pregnant women of 20-45 yr of age were identified for the study. The subjects who were in their first trimester were included in the study when they entered in their II<sup>nd</sup> trimester of pregnancy, as in the first trimesters of pregnancy there is hardly any change in the physiology of pregnant women than the non pregnant one and they were also not sure about their pregnancy. Therefore women in their I<sup>st</sup> trimester of pregnancy were excluded from the study till their pregnancy was confirmed. Though the sample size was 100, three of them were excluded from the study because two subjects were migrated to their parental house and one was the case of miscarriage. Information was generated using both primary and secondary data sources. Primary data was collected by personal interview method. For collecting uniform data, interview schedule was prepared and effort was made to include all possible questions relevant to the study.

**Haematological Parameters:-** For haematological parameters, initially pilot study of 30 samples was done. Three haematological tests were performed in nearby private pathologies. Venous blood was collected by trained Para medical professional. Blood was collected from antecubital vein in the arm by means of dry sterile disposable syringe and mixed in a small vial containing one drop of anticoagulant Heparin sodium.

For haemoglobin estimation of the entire study population blood was collected by finger prick method and the estimation was done by acid haematin method.<sup>(7)</sup>

**Sample Collection**

Blood samples were drawn and dispensed slowly. Large bore needles were used to minimise haemolysis, for the same reason, the needle was removed before dispensing the whole blood into plastic tube during sampling. Each subject was prepared by cleaning the site with separate alcohol swabs. The 20 gauge stainless steel needle was attached to a 5 ml. Syringe 5 ml of blood was slowly drawn into syringe. The needle was removed and the blood was dispensed evenly stoppered plastic tube

without any anticoagulant. The tubes were kept until clot retracts and then centrifuged approximately at 2000 rpm. For 10 minutes, within two hours of collection. The serum was separated into another stoppered plastic tube and stored at 4°C until tested.

**Methods:**

- Heamoglobin estimation (acid haematin method).<sup>7</sup>
- Calculation of mean cell volume (MCV) - As the packed cell volume and the number of red cells per cu. mm. were known and the mean cell volume was calculated.
- Calculation of Mean Cell Haemoglobin (MCH)- This was calculated as the red cell count and haemoglobin content
- Calculation of Mean Cell Haemoglobin Concentration (MCHC)- This was calculated as the haemoglobin concentration per 100 ml. of blood and packed cell volume were known
- Information regarding availability, consumption and duration of IFA (Iron-Folic Acid) tablets were collected. The reasons of non consumption of IFA tablets were also asked.

**RESULT:**

**Table 1: Distribution of subjects according to haematological variables and Relation of haemoglobin concentration with various groups of age, parity, religion, and food habit of respondents**

Variable Studied	NO of Respondent	Hb
<b>Age</b>		
21-25	44	10.15±2.83
>26	10	9.17±0.68
<b>Parity</b>		
Primipara	30	11.16±1.52
Multipara	32	10.47±2.79
<b>Religion</b>		
Hindu	88	10.78±2.72
Muslim	12	9.64±2.39
<b>Food Habits</b>	20	10.55±1.63
Vegetarian		
Non Vegetarians	80	11.28±2.24

Once the hemoglobin (Hb), PCV and TEC were determined, the type of anemia from which these women were suffering could be known by calculating other haematological indices like mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC). It was observed from the data

in table 1. To know about the incidence of megaloblastic anaemia, PCV and TEC was also tested beside the hemoglobin content. Since no any case was found to have megaloblastic anaemia, the other samples were not subjected for PCV and TEC test. Based on the results presented above, it was found that in almost all respondents only iron deficiency

anaemia was prevalent which could be managed by proper nutritional counseling and supplementation of Iron and folic acid tablets.

The data in table 1 reveal that maximum number of respondents who were below 20 years of age had mean haemoglobin followed by respondents aged 21 to 25 years of age with haemoglobin and respondent aged above 26 year of age with haemoglobin concentration respectively. These differences were statistically significant. Two parity groups were

constituted viz. primipara and multipara. Based on parity groups the data reveal that the subject who were having their first pregnancy were non- whereas women with more than one pregnancy were anaemic with mean haemoglobin concentration. These differences were found to be statistically significant. When the data was subjected to statistical analysis, it was found that the significant relation of anemia was found with the age group, dietary habit of the respondents

**Table 2: Distribution of pregnant women according to their general condition in relation to haemoglobin (Hb) concentration**

General Condition	No	%	Hb
Weakness	88	89.38	10.28±1.76
Fatigue (Afternoon)	55	56.44	10.66±1.80
Light headedness	23	23.86	9.78±1.82
Tachycardia	35	36.57	9.58±1.74
Anorexia	50	51.40	9.93±1.58

Physical appearance and general condition are the indicators of then general health. During benchmark survey, the general appearance of the respondents was recorded to evaluate their physical condition and general health.

**DISCUSSION**

Anaemia is a condition in which there is a reduction in total circulating haemoglobin. **Robinson and Lawler (1982)**<sup>(1)</sup> described the term anaemia as biochemically lowered hemoglobin levels, number of red blood cells and haematocrit. According to **Wintrobe et al. (1974)**<sup>8</sup> to understand anaemia it is useful to think of circulating red cells and the bone marrow. Anaemia is not a diagnosis in itself but merely an objective sign of presence of disease.

According to **Henery (1986)**<sup>9</sup> the MCV value less than 76 fl and MCHC values less than 30 percent were considered to hypochromic microcytic anaemia (iron deficiency anaemia). The data demonstrate that there is a definite reduction in size of R.B.C. but there was no significant difference in MCHC values of subjects. Thus the anaemia prevalent in these women was a microcytic type

Maternal age is one of major socio-biological factors which can affect the health of mother and fetal outcome. It has been observed that increased maternal age is associated with high prevalence of anaemia partially due to repeated pregnancies at short intervals and also because of premenopausal

syndrome (**Vasundhara, M. 1974**)<sup>10</sup>. Although the teen age girls attain their reproductive capacity as these mothers have yet to attain their full growth potential, hence nutrients are channelized to the fetus may affect the health of mothers (**Sharma, 1972**)<sup>11</sup> and can be precipitated in form of maternal anaemia

Significant difference was observed between the hemoglobin levels of vegetarian subjects than the non- vegetarian one. Same results were also observed by **Venkatachalam (1926)**<sup>12</sup> and **Sharma et.al (1972)**<sup>11</sup>. **Jai Bhagwan et.al (2008)**<sup>13</sup> found no correlation between type of diet and prevalence of anaemia probably due to very low frequency of meat eating in India

**Nirmala K. Murthy et. al (1989)**<sup>14</sup> also observed that moderate and severe form of anaemia reduces the endurance capacity very badly and anemic subjects had more difficulty in performing exercise. Study done by **Srimani S. etal (2008)**<sup>15</sup> revealed that iron deficiency anaemia affects the memory level, physical work capacity and immunity. It was revealed that the physical work capacity of non-anaemic subjects was better than the anaemic ones. Similar findings were also recorded by **Shubhada Kanani et al (1998)**.<sup>16</sup>

**Hall berg et al (1967)**<sup>17</sup> and **Elwood (1967)**<sup>18</sup> have also observed a close association between the menstrual iron loss and the circulating haemoglobin level. Total erythrocyte count (TEC), the other

important haematological parameter was significantly increased in later stage of pregnancy. This rise due to constant hypoxic stimulus produced by an anaemic condition, it is known as hypoxia stimulated erythropoiesis (Lund C.J. et al, 1967).<sup>19</sup> Feirokinetic studies have also demonstrated accelerated erythropoiesis due to increased oxygen demand during pregnancy, supporting the concept of an actual increase in red cell mass. (Pritchard, J.A. et al, 1964).<sup>20</sup>

According to Frank Firkin et al (1997)<sup>21</sup> demands for the synthesis of haemoglobin have a high priority for the amino acid pool and take precedence over serum and tissue protein formation in states of protein malnutrition. Very considerable depletion of body stores of protein must occur before haemoglobin production is specifically impaired. Buzina et al (1968)<sup>22</sup> noted that despite the adequate amount of iron in the family diet, the iron deficiency anaemia is commonly present in women was probably due to uneven distribution of nutrients among the family members and a high carbohydrate diet.

#### CONCLUSION:

As a result, a multi-media approach to nutrition and health education should be prioritised. Agriculture extension and home-science extension staff should assist rural women to build nutrition gardens and disseminate low-cost nutritious Suits, vegetables, and other foods for consumption in remote homes. Iron and folic acid tablets should be given to pregnant women as a source of additional nourishment. Access to safe and nutritious food is critical for maintaining a healthy and active lifestyle. In order to ensure the household's food security, the family's purchasing power should be boosted through various income-generating strategies.

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