

Diagnosis of Anaemia in Expectant Mothers

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INTRODUCTION

Anaemia is an important nutritional problem affecting all segments of the population in general and children, women and pregnant women in particular. It continues to be the most important single cause of maternal mortality and also in fact for such abnormalities as premature and immature births, still birth and neonatal mortality. Anaemia is associated with a decrease either in the number and size of red cells or haemoglobin content or a defect in their synthesis (Rajalakshmi, 1981). Anaemia results when the diet lacks in one or more of the nutrients needed for haemoglobin synthesis or in infections and disease conditions even when the diets are apparently adequate.

The overall proportion of anaemia in India was estimated to be as high as 80-90% (Anonymous, 1986) and at least 40-60% in expectant mothers of developing countries Passmore and Eastwood (1986) mentioned common symptoms of anaemia to be general fatigue, lassitude, and dimness of vision, anorexia and dyspepsia. Severe anaemia is claimed to impair work capacity and learning ability.

Surveys carried out on expected mothers in different parts of the country indicated that while 15-20 per cent are anaemic at the onset of pregnancy, the incidence increases to 60-70 per cent in the last trimester of pregnancy (Anonymous, 1975). Mudambi and Rajagopal (1990) noticed iron deficiency anaemia in Indian women to be much more prevalent and severe in late than in early pregnancy.

Anaemia due to iron deficiency is the commonest malnutrition disorder seen throughout the world and in India. The single most important cause for the widespread iron deficiency anaemia in our country is inadequate iron intake in the habitual diets compared with poor bioavailability of dietary iron (Anonymous, 1978).

MATERIALS AND METHODS

Thirty healthy pregnant women from each trimester of pregnancy (total 90) in the 20-30 years of age were randomly selected as experimental subjects from the areas of Palampur subdivision of Himachal Pradesh. The areas under

study were located at an altitude of about 1200-1500 meters above mean sea level. An additional group of thirty normal healthy females (non-pregnant, non-lactating) of similar age was also selected as control.

The anti-coagulated blood of the experimental subjects was analysed for different haematological parameters viz. haemoglobin, packed cell volume and red blood cell count as suggested by Mukherjee (1992). Red cell absolute values namely mean cell volume (MCV), mean cell haemoglobin (MCH) and mean cell haemoglobin concentration (MCHC) were calculated by the following expression as given by the same author.

$$MCV (\text{fl}) = \frac{\text{Haematocrit (\%)}}{\text{RBC count in millions}} \times 10$$

$$MCH (\text{pg}) = \frac{\text{Haemoglobin (g / dl)}}{\text{RBC count in millions}} \times 10$$

$$MCHC = \frac{\text{Haemoglobin (g / dl)}}{\text{Haematocrit (\%)}} \times 100$$

Diagnosis of Anaemia

Morphological and other classifications of anaemia were used for its diagnosis as suggested by Penington et. al., (1986). The subjects were diagnosed for five types of anaemia according to the following criteria:

Morphological Classification

- a) Normocytic anaemia
MCV: 76-96 fl
- b) Normochromic microcytic anaemia
MCV: less than 76 fl
MCHC: 30-35 g/dl
- c) Macrocytic anaemia
MCV: greater than 96 fl

RESULTS AND DISCUSSION

Normocytic Anaemia

It is defined as an anaemia in which the mean cell volume (MCV) is within the normal range (76-96 fl). Most normocytic anaemias are normochromic in which the red cells are of normal size and colour. This may be associated with normal reticulocyte count or increased reticulocyte (reticulocytosis).

The percentage of subjects classified as

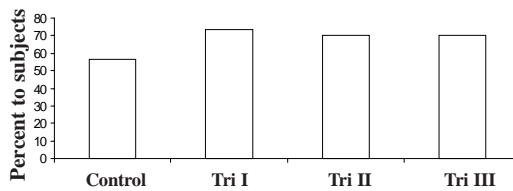


Fig. 1. Normocytic anaemia in control and pregnant subjects

anaemic by this criteria were 56.70 per cent for control group, 73.30 per cent for first trimester group and 70.00 per cent each for second and third trimesters (Fig. 1). The figure depicts that the most of the women during first trimester were suffering from normocytic anaemia, which forms a significant proportion (probably about 40 - 50 per cent) of all anaemias seen in clinical practice. It can occur from various causes i.e. a) blood loss b) disorders causing depression of bone marrow function c) the haemolytic anaemias and d) the 'physiological anaemia' of pregnancy. Thus, causative disorder should be corrected to prevent this type of anaemia which in severe cases respond only to symptomatic measures of blood transfusion.

Normochromic Microcytic Anaemia

A normochromic microcytic anaemia or simple microcytic anaemia is defined as an anaemia in which the mean cell volume is reduced (less than 76 fl) and the mean cell haemoglobin concentration is within the normal range (30-35 g/dl). Percentage of anaemic subjects (based on MCV) was negligible for control group and for first and second trimesters (Fig. 2). During third trimester, only 6.70 per cent of pregnant women were found to be suffering from this type of anaemia. Based on MCHC, 56.70 per cent of normal subjects 53.30 per cent, 33.30 and 50.00 per cent of pregnant women during first, second

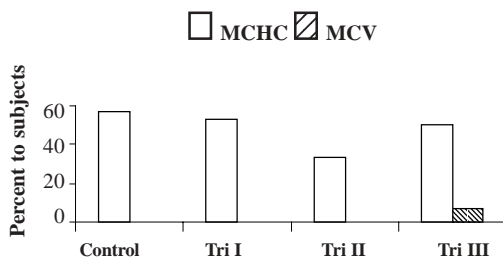


Fig. 2. Normochromic microcytic anaemia in control and pregnant subjects

and third trimesters of pregnancy were anaemic. Most of the disorders associated with normocytic anaemia with the exception of blood loss and aplastic anaemia may cause simple microcytic anaemia.

Macrocytic Anaemia

A macrocytic anaemia is defined as an anaemia in which mean cell volume is increased. In control group, 43.30 per cent of the subjects, and during pregnancy 26.70 per cent, 30.00 and 23.30 per cent of the women during three trimesters showed macrocytic anaemia (Fig. 3). This form is commonly associated with megaloblastic anaemia which results from deficiency of either vitamin B₁₂ or folate and responds well to the administration of the deficient substance. The blood examination of the patient shows immature nucleated red blood cells, which are bigger in size than normal RBC, and looks darker. The prevalence of this anaemia of pregnancy varies in different populations, apparently depending on the nutritional status of the population and for its eradication,

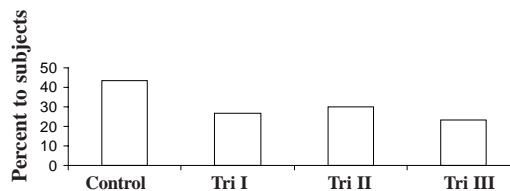


Fig. 3. Microcytic anaemia in control and pregnant subjects

prophylactic administration of folic acid, vitamin B₁₂ as well as iron is recommended.

CONCLUSION

The study revealed that expectant mothers during the three trimesters showed varying degrees of different forms of anaemia. Another point to be noted is that, in contrary to earlier studies conducted, the control group showed higher percentage of anaemic subjects. Most of the subjects covered in the present study were from rural background engaged in farming and having low socio-economic status. Poverty and their dual performance in home as well as in fields leaves little time for their self care.

Extensive diet surveys carried out in different parts of India indicate that the diets of rural people

are inadequate with respect to many nutrients. The diets of the poor are predominantly based on cereals and hence should be supplemented with protective foods to make the diet more balanced and adequate in all nutrients. It was also observed that the pregnant women were not aware of the nutritional needs during this period, hence nutritional education during antenatal visits should be considered as an important activity in providing antenatal care.

KEYWORDS Anaemia. Expectant Mothers. Healthy Female.

ABSTRACT Thirty healthy pregnant women (20-30 years) from each trimester of pregnancy were diagnosed for different types of anaemia. An additional group of thirty normal healthy females (non-pregnant, non-lactating) of similar age was also selected as control. The study revealed that during pregnancy, majority of expectant mothers in the third trimester were suffering from different forms of anaemia. In contrary to earlier studies conducted, the control group showed higher percentage of anaemic subjects.

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