

Study of the Relations between the Incidence of Anaemia and Different Component of Diet

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Abstract: In this present paper we study on relation between the incidence of anaemia and different component of diet. of Muzaffarpur district" in Bihar was launched, and conducted during 2019 to 2020. One hundred pregnant women in 15- 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.

Keywords: Anaemic, Adolescent girls, Nutritions, Diet, Vitamin, Protein, Hemoglobin.

1. Introduction

Nutrition is a combination of process by which mothers receive and utilize materials necessary for maintaining function, growth and renewal of its component. If the nutrition of the mother is inadequate then her body reserves are drawn upon and depleted. To meet the various requirements of growing foetus, the maternal system has to undergo certain remarkable changes in uterus, fallopian tubes, vagina, breast volume, composition of the blood, serum proteins, weight changes, basal metabolic rate, respiratory system, elementary functions, skeleton, skin, teeth, urinary system, nervous system and endocrine system etc. Science of nutrition determines the kind and amount of foods that promote health and well-being. Well-fed and properly nourished mothers have a healthy immune system and avoid anaemia. The Important aspects of the study are to study the incidence of anaemia in rural pregnant women and to ascertain their nutritional status, and to know the relations between the incidence of anaemia and different component of diet, particularly calories, protein, iron & folic acid. The present study is carried out in KhabraUrfKiratpurGurudas, Bhikhanpura&Jamalabad villages of Mushari block of Muzaffarpur district. All the three villages of the block are agriculture based with very small and holdings. The villages are within 10 km periphery of the city. The male members of the families are also associated in various other occupations in the Muzaffarpur city. Women of the area are mostly housewives. The main consideration while selecting the area of study was the feasibility of approach by the researcher since the researcher had strong rapport with the community which has helped her to take the reliable and accurate information related to study. Another reason for selecting the area was lack of nutritional awareness as there is hardly any programme being executed related to the improvement of nutritional status there by reduction of prevalence of anaemia in general and pregnant women in particular in the community. Although the health workers such as ANM, "Anganvadi" and "Asha" are posted in the village but the nutritional condition of the village is not satisfactory at all. Under such condition this type of study can play a role of balanced approach for assessment, analysis and action. This triple 'a' approach is essential for formulating appropriate bottom up solution.

2. Materials and Methodos

The data were collected by personal interview method. The schedule made for collecting data has been grouped under following heads:

2.1 Section A:

It includes the general information regarding family, ie name, education and occupation of the head of the family. Other important information about the family like

caste, religion, type and size of family, per-capita income etc were also included in this family schedule.

2.2 Section B:

Information regarding the individual subject falls under this section i.e. name, age, education, occupation of the subject and her husband, food habit and general history, information's regarding physical condition like fatigue and anorexia, clinical sign, obstetric history, anthropometric measurement and hematological parameters. Questions were also asked about menstrual history.

2.2.1 Anthropometric measurements:

The measurement of study women were done by under mentioned standardized techniques of metric system. Standardization of weight balance- standard weight were used periodically to verify the accuracy of weighing balance. All the samples 45 were weighed bare footed with minimum possible clothing. Zero error was corrected before taking each weight.

Weight- Mothers were weighed with minimum attire and bare foot in standing position on weighing machine.

Height- Height was measured after removing the shoes. The subject was asked to stand straight with head, shoulder, buttocks and heel vertically on the floor aligned to a straight wall. A scale was placed at the right angle on the head against the wall & marked at the level. The distance of floor to mark was measured by using measuring tape (in cm.). Precautions were taken that floor must be even.

Skin fold thickness:- Skin fold thickness was measured by skin fold calipers. Despite of practical difficulties in obtaining consistent results with skin fold calipers these provide the only simple means of measuring subcutaneous fat.

2.2.2 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 (Biological Evan, Hyderabad 50001.U. in 5 ml) For haemoglobin estimation of the entire study population blood was collected by finger prick method and the estimation was done by acid haematin method (John, V.D., 1994).

2.3 Section C:

46 This section gives information about some physiological problems of pregnancy like loss of appetite and frequency of vomiting, food habits of the respondents such as whether she is vegetarian or non-vegetarian, time duration between each meal, availability of different food groups, any food they avoid during pregnancy or any special food they started to consume during pregnancy state. It was particularly asked and recorded that how often they consume iron rich food. Diet survey was done by 24 hrs, food recall method. A chart was prepared for recording dietary intake of the respondents. These measures consisted of a set of standardized utensils, commonly used in household. The amount of food in household measures were converted into metric weight and the nutritive value was calculated by referring to "Nutritive value of Indian food", by C. Gopalan, B.V. Sastri and S.C. Balasubramanian (NIN, ICMR Hyderabad).

2.3.1 Haemoglobin estimation (acid haematin method)-

The haemoglobin content of blood was measured from a blood sample by preparing the acid haematin solution and compared to the colour of standard comparator box using following procedure. The haemoglobinometer tube was filled with N/10 HCl upto 20 cu mm marks. The outside of the pipette was whipped out and the blood was discharged into the Haemoglobinometric tube under cover of HCl taken. The tube was shaken vigorously to mix it well. Then the solution was diluted with N/10 HCl drop by drop and stirring intermittently with a glass rod till the solution matches the standard glass colour of the comparator box. Three readings were taken and mean haemoglobin percent was recorded.

2.3.2 Packed cell volume of erythrocyte-

Volume of red blood corpuscles expressed as a percentage haematocrit and of total volume of blood under examination, i.e. packed cell volume (P.C.V.) can be used as a simple and relatively accurate

screening test for anaemia, using following procedure. A small quantity of blood was drawn from the vial into a capillary pipette and it was expelled into the haematocrit tube. This was done by passing the pipette to the bottom of the haematocrit and as the pressure was applied to the bulb, the blood was slowly forced out and the pipette was withdrawn. This was done at such a rate that bubbles of air do not form in the haematocrit tube. The haematocrit tube was filled exactly to the 'O' mark at the left side of the scale, this needed a little practice. Haematocrit tube was then centrifuged at 3000 RPM for 30 minute to sediment the cells in serum. Volume of packed red cells was read directly from the number on the right side of the scale.

2.3.3 The total erythrocyte count of blood-

The blood was drawn in the erythrocyte pipette up to 0.5 marks meticulously. Outside of the pipette was quickly cleaned. The diluents (Tosin's fluids containing trisodium citrate-3.8%, formaline-1ml and distilled water-99ml) was drawn up to the mark of 101. Then the pipette was held horizontally and shaken gently for about half a minute in order to secure thorough mixing. Few drop of fluid was expelled from the pipette and discharged. This was done to remove the toison's fluid in the capillary portion of the pipette where mixing is incomplete. Cover slip was placed on the haemocytometer so that the central ruled area of the Neubauer's chamber lies at the center of the cover slip. A drop of solution was expelled between the cover slip and the ruled platform of the counting chamber. The fluid ran under the cover slip by capillary action. It was left for two minutes for setting of the cells over the ruled platform to ensure even distribution of cells in the chamber. Number of cells was counted in a group of 16 small squares from each four corners and one from the centre of the 'central square', that is in 80 small squares. (Cell was counted in each square including the cell which touches the top and right hand margin.)

3. Relation between Incidence of Anaemia and Different Components of Diet. Particularly Calories, Protein, Iron and Folic Acid.

Nutrition is a combination of process by which one receives and utilizes the materials necessary for maintaining function, growth and renewal of health component. The main aim is to determine the kind and amount of food that promotes health and wellbeing. Therefore it is obvious to establish the relationship between incidence of anaemia and different components of diet, particularly energy, protein, iron and folic acid which are directly associated with the incidence of anaemia. Prior to this it becomes obvious to know the type and quality of food stuffs consumed by the respondents.

3.1 Food habits and haemoglobin

The data presents in table 1 reveal that out of 97 only 19.59 percent respondents were vegetarian and the rest 80.41 percent were nonvegetarian. The mean haemoglobin in vegetarians was only 9.37 ± 1.49 gm/dl. as compared to non vegetarians 10.21 ± 1.95 gm/dl.

Table 1: Distribution of population according to their food habits in relation to haemoglobin concentration (n=97).

Food Habit	No	Percent	Hb mean gm/dl	±S.D.
Vegetarian	19	19.59	9.37	1.49
Non- Vegetarian	78	80.41	10.21	1.95

3.2 Food consumption pattern of respondents

Due to seasonal food availability and other resource constrains, the nutrition of pregnant women of rural areas highly depends upon availability of various food groups during the course of pregnancy, therefore the data regarding this parameter is presented in table 2.

Perusal of data, in table 2 reveal that availability for cereal is 91.57 percent where as it is not available to 8.43 percent studied population. The pulses are rich source of protein and certain vitamins but availability of pulses is only 29.9 percent where are these are un-available to 70.10 percent respondents. Fats and oils which are the richest source of energy are available to only 28.87 percent respondents. Availability of Suits and vegetable was witnessed to 14.75 percent and 67.01 percent respondents respectively. About 85.25 percent studied populations are deprived from consumption of Suits. Milk, curd, meat and fish are also the richest source of protein and several essential amino acids which are largely required during pregnancy. The availability of these food groups was meager than the requirement i.e. 12.37 percent and 21.65 percent population can only afford these two

essential food groups where as about 87.63 percent were deprived of milk and milk product and 78.35 percent from meat and fish. Same findings were also reported by N.R Raut-(2009) and Srimanietal (2008).

Table 2: Distribution of study Sample according to the availability and non- availability of various food groups

Food groups	Availability (%)	Non- availability (%)
Cereals	91.57	8.43
Pulses	29.90	70.1
Fats and Oils	28.87	71.13
Milk/Curd	12.37	87.63
Vegetables	67.01	32.99
Fruits	14.75	85.25
Meat / fish	21.65	78.35

A high carbohydrate intake in early pregnancy suppresses placental growth, especially if combined with low milk protein intake in late pregnancy. Such an effect could have long term consequences for the of spring's risk of cardio vascular diseases (God Frey et al, 1996). The main reason observed for non-availability was poor purchasing power of the respondents. Another reason of non- availability of food groups are the discrimination in the distribution of food within the family. Even in many well to do Indian families, the women eat only after the men folk have finished their meals.

3.3 Dietary intake of energy, protein, iron and folic acid in study sample.

Among various nutrient ingredients only total energy, protein, iron and folic acid was taken into account as these ingredients are directly related with incidence and rectification of anaemia during the course of pregnancy.

3.4 Nutritional variable

Among nutritional variables only four components viz total calories, protein, iron and folic acid intake by respondents was taken into account as these are directly associated to induce anemia. The data presented in table 3 reveal that on an average only 1813.14 ± 274.21 calories (kcal) are taken daily. Similarly protein, iron and folic acid intake is 38.50 ± 14.32 gm., 30.86 ± 8.53 (mg.) and 222.38 ± 61.60 pg per day respectively.

Table 3: Distribution of subjects according to nutritional variables.

Nutritional variables	Mean	\pm SD
Energy (kcal)	1813.14	274.22
Protein (gm)	38.91	14.32
Iron (mg.)	30.86	8.53
Folic acid (pg)	222.38	61.60

4. Conclusions

The data reveal that out of the respondents who complained, only 15 had a intake of mean folic acid 245 ± 58.92 pg/day in 2nd trimester. Their MCV was 73.82 ± 10.48 fl. During third trimester the dietary folic acid intake per day of 15 respondents was 215.66 ± 43.36 pg and the MCV level was 76.24 ± 9.06 fl. However, no statistical significance was observed during the course of investigation. The folic acid which is required for proper maturation of RBC and its deficiency causes macrocytosis is absent in present blood picture as the mean corpuscular volume is not increased in the second and third trimester of pregnancy. As stated by Frank Firkin et al (1997) areas in which green vegetables are consumed as a major part of the diet, are relatively free from folate deficiency of pure dietary origin, provided the vegetable are cooked in a manner that preserves folate content.

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