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Analysis of nutritional status of pregnant women in rural areas of Bihar state

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Abstract

The study assesses nutritional status of pregnant women in rural of Bihar State. Pregnant women have been widely recognized as a vulnerable group from health point of view. They need more food than normal person for the proper nourishment of the growing foetus. The field of nutrition of the pregnant women, particularly in rural area, has been sadly neglected.

Against this backdrop, the study was carried out among pregnant women from 15 different villages of Bihar. This study included two phases in which the phase consists a pre-tested structured interview schedule was used for the collection of general information. 24 hour recall method of diet survey was applied for the collection of dietary information. Hemoglobin level was collected from Doctor's report for observing the anemic condition. It was found that the mean Iron, calcium, carotene and folic acid was much lower than the recommended dietary allowances (RDA) volumes. Percent incidence of common nutritional deficiencies among the pregnant women was much higher in the third trimester than the 1st and 2nd trimester. In spite of better education and high - income, nutrition intake was lower than RDA in case of many sample women.

Keywords: Nutritional Status, Pregnant Women, Maternal nutrition, Food Expenditure, Dietary Pattern, Anemia

1. Introduction

Maternal nutrition and health is considered as the most important regulator of human fetal growth. A healthy mother can produce a healthy child. If women are not well nourished, they are more likely to give birth to weak babies resulting in high infant mortality rate. Numerous studies in India and elsewhere have shown that in chronically undernourished women subsisting on unchanged dietary intake in pregnancy and lactation have an adverse effect on maternal nutritional status. In pregnancy anemia has a significant impact on the health of the foetus as well as that of the mother. Maternal under nutrition is associated with low birth weight and all its attendant adverse consequences. It is the most wide spread nutritional disorder in the world effecting 30 percent of the world's population. It is more common among the expectant mother. A related concern is that anthropometric indicators of nutrition in India, for both adults and children, are among the worst in the world. Pregnant women have been widely recognized as a vulnerable group from the health point of view. It has been universally accepted that they need more food for the growing foetus. They constitute the important segment of the population with higher nutrient requirements.

2. Objectives

- Know the socio-demographic features of sample respondents.
- Record the food and nutrient intake of the respondents and compare the same with the available recommended dietary allowances (RDA).
- Observe the impact of socio-demographic features on food and nutrient intake of the respondents.
- Analyze the prevalence of nutritional anemia among the respondents.
- Analysis of current iodine status among pregnant women.

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3. Methodology

The methodology for systematic investigation on research title has been decided as under-

- Selection of area: Patna Medical College and Darbhanga Medical College was selected for the study.
- Selection of subjects: All the pregnant women in the mean age group of 33 years and had their antenatal care from the medical College were selected for the study.
- Selection of tools: The tool selected for the study included interview schedule, health assessment card, proforma for assessing the nutritional knowledge and pathology lab tests.
- Data collection: Anthropometric measurement of pregnant mothers was taken. Biochemical analysis i.e. Hemoglobin estimation of pregnant mothers was completed to know their anemia status.
- Analysis of data: Necessary statistical application such as chi-square test, t-test, z-test will be applied to test the significance of the obtained data.

4. Results and Discussions

The results of the entitled assessment are discussed and presented as under

a. Monthly Food Expenditure of the Families of the Pregnant Women

Table 1: Indicates the monthly food expenditure pattern of the families of the pregnant women.

Details	Percentage of Total Income		
	Low (n = 125)	Middle (n = 145)	High (n = 70)
Cereals	50.6	43.4	35.8
Pulses	2.4	2.7	3.5
Green Leafy Vegetable	1.5	1.8	1.8
Roots and Tubers	4.9	3.6	2.7
Other Vegetables	5.7	6.2	6.7
Fruits	3.3	3.7	4.3
Milk and Milk Products	3.7	4.8	5.2
Meat, Fish, and Poultry	8.7	10.2	12.3
Nuts and Oil Seeds	2.6	3.4	4.3
Fats and Oils	3.9	4.3	5.5
Sugar and Jiggery	3.8	4.7	5.3
Beverage (Tea, Coffee)	4.7	6.2	6.4
Processed / Ready Made Food (Bakery, Fried Ites, Pickle, Pappad)	4.2	5.3	6.4

Table – 1 Monthly Food Expenditure of the Families of Pregnant women

Since cereals / millets are the cheapest widely available source of energy, the intake is highest among the low income families and it decreases with increasing income. Similar effect had been noted in the present study, i.e., 50.6 percent of the food expenditure was towards cereals by the low income groups whereas only 43.4 and 35.8 percent was spent on cereals by middle and high income groups.

Low, middle and high income group families spent only 2.4, 2.7 and 3.5 percent of their food expenditure for pulses and 1.5, and 1.5 and 1.8 percent of their food expenditure for green leafy vegetables. The expenditure on root and tubers was high (4.9 percent) in the low income group when compared to that of the middle and high income groups which was 3.6 and 2.7 percent respectively. This was due to the higher consumption of tapioca by the families of low income. Tapioca is consumed in Kerala as a source of energy and it helps to meet a short supply in cereals.

b. Dietary Pattern of Pregnant Women

i. Meal Pattern of Pregnant Adolescents

Snacking is a way of life for women and can make a positive contribution to the nutrient quality of an adolescent's daily intake. As per snacks provide one - fourth to one - third of the daily energy intake for adolescents.

In the present study, majority of the women from all the three income groups had three meal patterns per day whereas the intake of snacks increased with increasing income. Sixty seven percent of the women of low income had two snacks, 57 percent of the middle income group had three snacks and 53 percent of the high income group had three snacks.

ii. Frequency of Intake of Various Food by the Pregnant Women

A maximum of 24 percent from low income used wheat only once in a month whereas 24 percent from middle income used once in for night and 25 percent from high income used once in a month. Thus, the usage of wheat is maximum among the middle income families compared to that of low and high income families.

None of the pregnant women consumed pulse daily. The maximum consumption was weekly thrice by 28 percent from high income, 18 percent from the middle income and five percent from low income. Daily consumption of green leafy vegetable was not observed among all the three groups. The maximum percentage of 27 to 37 percent of the high and middle income consumed it only once in a month and 32 percent of low income used once in fortnight.

iii. Food Included by the Women During the Present Pregnancy

The review result revealed that some common food was included specially by the pregnant women of all the three income groups. Among the various food included, milk ranked first with 35 percent. Its inclusion was due to the fact that it is rich in calcium, good for teeth, bones and for general health. found that the majority of pregnant women increased their food intake during pregnancy and that many started drinking milk. Fruits, egg and rice flakes were also included in the diet by 32, 26 and 15 percent respectively due to its rich vitamin, iron and fiber content.

iv. Foods Avoided During the Present Pregnancy

As a result of wrong and unscientific belief, a number of foods are excluded from the list of food item by people of many religions and society. Among the selected adolescents, 43 percent of them avoided some food due to the pregnancy. It is obvious that pregnant adolescent, 47, 25 and 10 percent of low, middle and high income groups avoided fruits like papaya and pineapple and horse gram with the belief that these food may induce abortion in the mother. Spicy foods were avoided by 11 percent due to its gas producing and heart burning effect. Four percent and two percent of the pregnant women avoid meat and egg as it may cause nausea and oozing from the baby's ears.

c. Obstetric Detail of the Pregnant Adolescents

i. Oral Nutrient Supplement Taken by the Pregnant Adolescents

Among the total number studied, 52.5 percent of the women did not take any supplements and maximum 22.5 percent had iron, folate, and B - complex. Only 47, 50 and 45 percent of the pregnant women from the three age groups receive oral nutrient supplementation and iron and folic acid supplements

were taken by almost 45 percent from all the three age groups. Revealed that folic acid supplementation during pregnancy showed a significant reduction in the rate of preterm birth.

A study by found that the use of prenatal supplements by the low income urban women reduced the risk of preterm delivery and low birth weight. It was revealed from the present study that about 50 percent of the pregnant adolescents were irregular in the consumption of nutrient supplement due to their ignorance.

ii. Minor and Major Ailments Prevalent Among the Pregnant Adolescents

Nausea was experienced by 36, 29 and 69 percent and vomiting by 20, 7 and 3 percent of the pregnant women of the three age groups. Nausea and vomiting may be associated with a lowered risk of miscarriage, still birth, prenatal mortality, preterm delivery, low birth weight and foetal growth retardation (Broussard and Richer, 1998). Heart burn was felt by 18, 4 and 3 percent of the pregnant adolescents. The 23, 36 and 13 percent of pregnant women from 16-17, 17-18 and 18-19 years had muscle cramps. The common occurrence of muscle cramps during pregnancy manifested nocturnally by sudden contractions of the muscle is thought to be related to a decline in serum calcium levels related to a calcium phosphorous imbalance.

iii. Parturition Details of the Pregnant Adolescents

Parturition details of the pregnant women in the present study revealed that highest (19) percentage of complications were seen among the women in the age of 16- 17 years. Thus complications increased as the age of pregnancy decreased.

It is evident that obstetric loss, namely abortion, was under gone by 22 percent of the subjects of 16-17 years, while it was 19 percent among the adolescent from 18-19 years of age. Still birth was also evident in six percent of the women in the age group of 16-17. These results match the result of Sharma et al (2003), which indicated that delivery related complications were reported by 11 percent women compared to only 5.8 percent adults and it was also evident that pregnancy wastage was about six times more common in women than that of adults. But in the present study, complication was experienced by only 5 percent which is a positive change.

d. Percentage Prevalence of Anemia Among the Women During Pregnancy

It is saddening to note that all the women in the age group of 16-17 years were anemic. A maximum of 61 percent pregnant women among 18-19 years were mild anemic and moderate anemia was maximum (56 percent) among 16-17 years. It is also observed that the incidence of mild anemia increased as the age increased whereas the incidence of severe anemia decreased as the age increased. The results of the study by showed a higher incidence of anemia among teenage mother (17.1 percent) compared to adult mother (11.1 percent). But in the present study, a higher incidence (96 percent) of anemia was observed among of the pregnant adolescents.

e. Anthropometric Measurements of the Exterogestate Infants of the Adolescents

The anthropometric measurements like weight, crown heel length, head, chest, and mid upper arm circumferences were below the reference values of AIIMS (1993) [5]

The weight of the infants born to mothers in the age group 16-17 was low (2.64 o.34) when compared to the weight of the infants born to mother in the age group of 17-18 and 18-19

years and the increase was statistically significant. The measurements increased as the age of the mother increased with statistical significance.

Crown heel length of all the infants was low when compared to the reference value but it showed a slight increase with increase in the age of the mother. Head, chest and mid upper arm circumferences of all the infants were low compared to the reference values. But the results reveal that the measurement increased slightly as the age of the mother increases.

It is noted that among the female infants 6 percent of them were with low birth weight. But among the three age groups, the prevalence was doubled in 17-18 years (7.5 percent) and tripled in the age of 16-17 years when compared to that of 18-19 years (3.8 percent).

f. Determination of Urinary Iodine Excretion (UIE)

Urinary iodine excretion (UIE) of 302 pregnant women was used to monitor the effect of universal Salt Iodization. The result obtained from the 1st to the 3rd trimester showed that the mean and median UIE were 152.09 ± 41.65 and 163.1 lg/1, respectively. The UIE ranged from 28.1 to 218.1 lg/1. The results showed that none of the women have severe (<20 ig/1) iodine deficiency, 5 (2%) have moderate (20-49 lg/1) iodine deficiency, 37 (12%) have mild (50-99 lg/1) iodine deficiency, while 242 (80%) have optimal (100-199 lg/1) iodine nutrition range and 18 (6%) have more than adequate (200-299). The UIE between the 1st trimester and the 2nd trimester varied slightly ($P = 0.046$), while UIE between the 1st and 3rd trimester varied significantly ($P= 0.0001$). There was no significant difference between UIE in the 2nd and 3rd trimester ($P=0.06$). From the result, a trimester was observed and the decrease was significant ($P = 0.0009$).

g. Measurement of the TSH Serum Concentration

The result of Thyroid Stimulating Hormone (TSH) concentration measurements, of 58 pregnant women in their 1st trimester of pregnancy is studied. The result showed that 7 (12%) of the pregnant women had TSH values between 0.0 to 0.5 IU/ml (Hyperthyroid status). A total of 50 (86%) of the women had TSH level between 0.6 to 4.10 IU/ml (normal thyroid status). Also the result showed that 1 (2%) of the pregnant women had TSH value > 4.10 IU /ml (Hypothyroid). From the result the mean and median TSH concentration values were 1.11 ± 0.76 and 1.07 IU /ml, respectively and the TSH values ranged from 0.39 to 6.00 IU /ml. The result of TSH concentration measurements, of 82 pregnant women in their 2nd trimester of pregnancy are showed in Figure - 17. The result showed that 2 (2%) of the pregnant women had TSH values between 0.0 to 0.5 IU/ml (Hyperthyroid status). A total of 80 (98%) of the pregnant women had TSH level between 0.6 to 4.10 IU/ml normal thyroid status. The result also showed that none of the pregnant women had TSH value > 4.10 IU /ml (hypothyroid condition) From the result, the mean and median TSH concentration values were 1.39 ± 0.53 and 1.39 IU/ml, respectively. The TSH values ranged from 0.47 to 3.09 IU/ml.

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