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IMPACT OF DIET COUNSELING ON PREGNANCY AND ITS OUTCOME

Food Science

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ABSTRACT

It is evident from the literature about infant mortality and poor dietary intake during pregnancy. Many health related problems are envisage and documented. Their dietary habits were related to their complaints about discomforts. Poor awareness about the diet and wrong beliefs about foods to omit during pregnancy had severe impact on the health of pregnant mother. An attempt is made to understand the improvement in anthropometric measurements and hemoglobin level of a pregnant mother from socioeconomic class. These mothers were given nutritional education and proper diet counseling during their pregnancy. It is expected to result in a better anthropometric parameters of pregnant mother and pregnancy outcome after diet counseling

KEYWORDS:

Diet counseling, Anthropometric measurements Pregnancy outcome

INTRODUCTION

Nutrition has direct impact on our personal life[1]. The pregnant woman must understand that her nutrition will be critical to own health and also to pregnancy outcome[2]. Maternal nutrition is the key axis not only for the maternal wellbeing but also for the survival of the offspring. In developing countries like India, in-spite of economic growth, better life expectancy malnutrition persists among pregnant mother from socio-economic class family. The poor economic status of the pregnant mother is related to her inappropriate food habits, lack of nutrition awareness and rising food prices[3]. The nutrition demands during pregnancy are extraordinary because the growing fetus requires additional minerals and other nutrients for healthy growth. Since the nutritional status of women during pregnancy is of great importance for the well-being of the nation, any kind of altered nutrition can affect women as an individual as well as the growth of her pregnancy, Literature endorsed average weight of pregnant women as <38Kg and height <145cm. Although obesity is well recognized as a current public health problem, its prevalence and impact among pregnant women have been less investigated.

The objective of the study was to evaluate the impact of diet counseling among pregnant women, describing its prevalence and risk factors, and their association with adverse pregnancy outcomes. The study focuses on to assess the nutritional status of pregnant women from Mumbai city. The data comprises of anthropometric measurement namely weight, height along with hemoglobin level, blood pressure and diet during first and third trimester of pregnancy.

MATERIALS AND METHODS

A cohort of 200 pregnant women, at approximately 12 to 15 weeks of pregnancy and aged 23- 25 years and 32-36 tears were selected from prenatal public clinics of Mumbai city. Pre-pregnancy weight, age, educational level and parity were obtained from a standard questionnaire. Information regarding their age, occupation, income, number of family members, types of family were obtained using a pre-planned interviews schedule. Anthropometric measurements were made using authentic method reported in literature. All the measurements were made in triplicate and average values were reported. The Nutritional status was defined using body mass index (BMI), according to World Health Organization (WHO) criteria. The food consumption pattern was assessed using 24hours dietary recall. Certain important biochemical parameters like haemoglobin level and recorded. Nutritional counselling was provided to each subject and anthropometric measurements of pregnancy outcome were recoded. The results were collected and tabulated for the scientific discussion.

RESULTS AND DISCUSSION

All the selected subjects were interviewed personally and pre-planned questionnaire was used to collect data on their life style and dietary habits. The results were tabulated and interpreted logically and conclusions were made based on scientific evidences. The selected subjects were classified based on the personal information are tabulated in Table 1. The result indicates that both younger and older subjects belong to socio-economic class having average income of the family in the range of Rs.10000 to Rs.12500/- per month. All the subjects were relatively young and working for the family. The age of pregnant women under study ranged between 22 to 27years and older women from 30 to 34years respectively. The family size is appropriate and needs better life through healthy food habits. However, concept of healthy diet is not understood by most of the subjects. Nearly 80 percent subjects consume diet as per the old beliefs and guided by their senior members of the family.

Table 1 General information of pregnant women

Average value of Parameters	Younger women (N= 120)	Older women (N= 80)
Age (Years)	25.8	32.1
Monthly Income (Rs)	10000	12500
No. of family members	4	6
Hours of work(Hr/day)	8	7

It is a common problem of pregnant women with respect to their diet during pregnancy. Most of the pregnant mothers are not aware of the advantages of proper nutritional effect of food intake during pregnancy[4]. Various reasons are unfolded during diet survey of selected subjects[5]. Each of the subjects were given diet counselling during three trimester of pregnancy. The dietary habits of the subjects were recalled from the interview during first and third trimester. Major nutrients intake was calculated and average values are reported in the Table 2. The values of nutrients were calculated from the daily food consumption and converted in to nutrient parameters using WHO guidelines.

Table 2 Average nutrient intake by pregnant women

Nutritional Parameters	Pregnant mother First trimester	Pregnant mother Third trimester
Energy (Kcal)	2098 ± 915	2300 ± 875
Carbohydrate (g)	268.9 ± 137.1	290.7 139.4
Fat (g)	84.5 ± 46.5	87.3 1 28.9
Protein (g)	79.3 ± 44.4	84.8 ± 23.4
Calcium (mg)	734.1 ± 562.9	820.8 ± 445.2
Iron (mg)	27.3 ± 20.1	28.5 ± 12.7

It is evident from the data that all the subjects had poor diet in particular with respect to protein and iron intake. However, carbohydrate and fat intake was within the recommended values by WHO[6]. These nutritional parameters are related to their age group and economic conditions of the subjects. Also, the myths about certain food intake resulted into poor values of protein and mineral. To support these favourable changes in the health of pregnant women, anthropometric measurements biochemical profile was collected during pregnancy. The anthropometric measurements and biochemical parameters were made during first and third trimester. The results are reported in the Table 3.

A proper well defined counselling program was used to improve the health of the subjects during pregnancy7. After diet counselling survey was conducted to investigate the improvement in anthropometric parameters of pregnant mother.

Table 3 Anthropometric and Biochemical profile of pregnant women

Anthropometric and Biochemical parameters	Pregnant mother First trimester	Pregnant mother Third trimester
Weight (Kg)	57.43 ± 7.98	66.47 ± 6.45
Height (cm)	143.8 ± 14.7	144.8 ± 11.2
BMI	24.31 ± 4.87	25.71 ± 5.84
Blood Pressure Systolic (mm of Hg)	135 ± 12	128 ± 11
Blood Pressure Diastolic(mm of Hg)	89 ± 9	85 ± 9
Hemoglobin (g/dl)	12.1 ± 2.4	11.6 ± 4.8

The average values of anthropometric measurements indicate that all the subjects had weight and height values in normal range. The weight and height ratio was in the normal range. The first model of multiple linear regression included age, education, household income, pregnancy. The weight gain for a woman of healthy body weight is recommended to be between 60-70 Kg. during the course of pregnancy. An underweight woman who fails to gain adequately during pregnancy is most likely to give birth to a baby with dangerously low birth weight[8, 9]. Infant birth weight is the single most potent indicator of a child's future nutrition and health status

BMI value was in normal limit but show minor increase during third trimester. These changes can be attributed to diet counselling. The systolic and diastolic blood pressure was also in in range[10, 11]. The haemoglobin level is decreased marginally during third trimester. It is expected to change values of anthropometric measurements with progress of pregnancy. During pregnancy, body goes through numerous physical changes to accommodate for fetal growth and development. Throughout these nine months, it's ideal to have a normal blood pressure reading. The rapid changes in body during pregnancy can greatly influence these numbers and cause a drastic change in blood pressure. According to the American Heart Association (AHA), a normal blood pressure reading is 120/80 mm Hg and below. Readings below 90/60 mm Hg indicate low blood pressure, or hypotension, while readings above 140/90 mm Hg indicate high blood pressure, or hypertension. Hypertension is seen far more often in pregnancy than hypotension[12]. An abnormal blood pressure reading during pregnancy is a cause of concern. Both mother and baby may be at an increased risk of health complications.

Trimester is positively associated with most nutrients intakes, such as energy, protein, carbohydrate, Vitamin A, niacin, Vitamin C, calcium, phosphorus, potassium, magnesium, and zinc[13,14]. However, pregnancy BMI is inversely associated with energy, fat, Vitamin C and calcium intake. Educational level and household income were positively associated with folic acid intake. Underweight women are advised to take care of their nutrition needs of minerals, vitamins and all the other necessary nutrients, but to consume extra amounts of them so as to gain weight in a healthy manner. It is advisable for an underweight woman to gain about 20Kg during the course of her pregnancy. Teenage mothers seem to be at greater risk for this condition than adult women.

Mother's nutrition before pregnancy is decisive factor to determine whether her uterus will be able to support the growth of a healthy placenta during the first month of gestation. The Placenta is a sort of cushion of tissue in which the mother's and baby's blood vessels intertwine and exchange materials. The two bloods never mix, but nutrients and oxygen cross from the mother's blood into the baby's blood while wastes move out of the baby's blood, ultimately to be excreted by the mother. Far from being passive in its transport of molecules, the placenta is a highly metabolic organ with about 60 sets of enzymes of its own. It actively gathers up hormones, nutrients, and protein molecules such as antibodies and transfers them into the fatal bloodstream It also produces hormones that maintain pregnancy and prepare the mother's breasts for lactation. Improper balance of the proper nutrients can affect the mother and child.

A condition that is always fatal within a few days or weeks after birth. Some are caused by mother's malnutrition, disease and injury during pregnancy[15]. Most women don't know they are pregnant so good nutrition is always important. Enough folic acid is required to fuel the explosion of new cells which occur with gestation. Vitamin's B_6 and B_{12}, the minerals Iron and Magnesium and the other major and trace minerals which are involved in normal cell division and replication are essential. Amino acids are the structural building blocks for new tissues. Damage can be prevented by supplying the proper diet and supplement changes. It definitely pays for the woman in her child-bearing years to ensure that at all times she has the proper balance of minerals, vitamins, and other nutrients necessary to support life. Studies have shown that pregnant women consume more fat than non-pregnant women, and the increase takes place between the first and second trimester[16].

The immense need for extra nutrients a woman needs before and during pregnancy, she is only recommended to consume 300 calories more than a non-pregnant woman and then only during the second and third trimesters. The 300 calorie allotment is not always attainable, but it does make it very important for the woman to consume nutrient-dense foods, and take quality nutritional supplements so that she can get these extra items without gaining more weight than is healthy.

Iron-deficiency anaemia is more prevailing in pregnant mother[17,18]. Pregnant women need more iron than normal for the increased amount of blood they produce during pregnancy. Symptoms of a deficiency in iron include feeling tired or faint, experiencing shortness of breath, and becoming pale. Because these symptoms are common for all pregnant women, health care providers check iron levels throughout pregnancy. The WHO recommends 27mg of iron daily to reduce the risk for iron-deficiency anaemia. Some women may need extra iron through iron supplements. Haemoglobin, carries oxygen from the lungs to the body's tissues. Similarly, this protein carries carbon dioxide from the tissues to the lungs in the process of breathing out. The main component of RBC is iron molecule. The normal value of haemoglobin level in women ranges between 12 to 16 g/dl. It is a practice to estimate the haemoglobin level as soon as the pregnancy is confirmed. This shows the significance of haemoglobin levels during gestation. The body of pregnant women requires more oxygen and the oxygen-carrying capacity of the blood is proportional to the circulating haemoglobin concentration. It is quite normal for haemoglobin levels to fall during pregnancy. This is because the blood volume increases by 50% in the course of pregnancy for providing essential nutrients for the developing baby. It starts to increase around the 8th week of pregnancy. The increase in blood plasma is higher, when compared to the increased RBC volume. This decreases the concentration of RBC in the blood, bringing down haemoglobin levels. The level of haemoglobin dropping to 10.5 g/dl is quite normal in the course of pregnancy. Even though it is normal for the haemoglobin level falls to 10.5g/dl causing mild anaemia in the course of pregnancy, when it goes below 10g/dl, it can cause several heath issues that affect the mother and child and the normal progression of the pregnancy. If an iron supplement is not taken properly as directed by the doctor, the low haemoglobin level can cause: feeling more and more tired, Dizziness, Pale lips and skin, Brittle nails, Shortness of breath at rest, Increased heart rate, Hands and feet feel cold. When the haemoglobin level falls below 6g/dl, the expecting mother will experience angina, a condition characterized by severe pain in the chest, which moves to the shoulders, arms, and neck, due to an insufficient blood supply to the heart[19].

The results indicate the improved nutritional status and anthropometri c parameters of the subjects. The positive impact of diet counselling is observed on the anthropometric parameters of the pregnancy outcome. These measurements are reported in Table 4. It is evident that pregnancy outcome of younger mother was impressive as compared to upper age group mother.

Table 4 Anthropometric measurements of infant born

Parameters	Younger women (N= 120)	Older women (N= 80)
Weight of Infant (g)	2.976 ± 4.5	2.870 ± 3.8
Crown heel length (cm)	50.6 ± 11.9	51.3 ± 10.8
Arm circumference (cm)	22.8 ± 7.1	21.7 ± 4.7
Head circumference (cm)	34.5 ± 2.3	33.8 ± 29
Chest circumference (cm)	139 ± 24.	127 ± 16

If required a proper counselling was provided to each subjects during the project. A simple nutritional education was provided to pregnant mother and explained the need for healthy dietary habits. It is recommended that before becoming pregnant, a woman must establish nutrition habits that will optimally nourish both the growing foetus and herself. Pregnant mothers must be well nourished because in early pregnancy the embryo undergoes rapid and significant developmental changes which depend on the prior balance of minerals, vitamins, and other nutrition concerns of the mother. .

CONCLUSION

Two hundred working women of different age groups were surveyed during their pregnancy. Questionnaires and anthropometric measurements were used for the purpose. Data revealed that a significant correlation between eating patterns and anthropometric parameters exists. There was Significant negative correlations exist between dietary knowledge and eating habits. Nutritional counseling was provided to each woman during first trimester of pregnancy. The anthropometric parameters of pregnancy outcome show positive impact of nutritional counseling.

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