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## Impact of Dietary Intake of Pregnant Women on Neonatal Outcome in North Chennai

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### ABSTRACT

Maternal nutrition plays a fundamental role in optimizing pregnancy outcome and unlike other factors, such as heredity or pre-existing conditions; the nutritional status is amenable to change. The objective of the study is to find out the impact of dietary intake of pregnant women on neonatal outcome in North Chennai. The study was conducted in two hospitals in Old Washermenpet from Chennai District. A total of 196 pregnant women in the age groups of 18 – 35 years in the last trimester were enrolled for the study. The dietary intake of pregnant women from three different socio-economic groups (low, middle and high) was assessed by dietary assessment in selected hospitals. The nutrient intake of pregnant women showed a significant difference (1% level) with income groups. The mean calorie intake of low, middle and high income women were found to be 1858 kcal, 1950 kcal and 2132 kcal respectively. There was a significant difference in nutrient intake of pregnant women with RDA at 1% level. There was a significant interrelation between Vitamin A intake and head circumference of the neonates at 5% level. Birth weight of neonates belonging to low income group was lesser when compared to other income groups (1% level). Based on family income, the purchasing capacity of food varies and thus it had an influence on dietary intake of pregnant women in all the three groups.

**Keywords :** Pregnancy, Dietary intake, Maternal Nutrition, Neonatal outcome

### INTRODUCTION

Despite economic development, India continues to have high incidence of infant and childhood mortality and malnutrition. Perinatal deaths (stillbirths and deaths within 7 days of birth) contribute to over 80% of neonatal deaths (infant deaths within 28 days of birth). The reasons for this are complicated, but the primary point was neglecting female health and nutrition, lack of skilled assistance during delivery, and poor neonatal care (Bamji M S (2000).

Nutrition has an influence on the course and outcome of pregnancy. During the course of pregnancy, the maternal organism undergoes a remarkable series of physiologic adjustments in order to provide for fetal growth and development and at the same time preserve maternal homeostasis (Chaudhary R, 2004).

When nutritional status is poor and nutritional in-take is less, then hormonal adjustment and maternal reserve is jeopardized. Many food taboos prevalent in the society either allow or prohibit the expectant mothers to consume some food. Food habits and customs differ from culture to culture. The ill effects of malnutrition during pregnancy are well recognized. It can be avoided by adequate intake of nourishing foods (Sahoo S, 2005).

According to a study done by Rao S, 2001, the dietary intake of energy and protein of rural Indian mothers are low. The consumption of foods that are important sources of micronutrients, such as dairy products, meat, fresh fruits and green leafy vegetables (GLV), is also low in rural Indian population. Rural Indian women are often engaged in a high level of physical activity. Food frequency questionnaires (FFQ) that are likely to offer estimates of habitual intake have rarely been used in studies of pregnant women.

The prevalence of low birth weight children is still unacceptably high for India. The nutritional status of infants is closely related to the maternal nutritional status during pregnancy and infancy. In order to reduce the incidence of low birth weight better coverage of expectant women should include

supplementary nutrition right from 1st trimester and should continue during the major period of lactation, at least for the first one year after pregnancy (Park K, 2007). Limited data are available on the nutritional status of pregnant women from the urban community of Chennai city, India; hence, the present study was conducted with the following objectives.

1. To assess the dietary intake of pregnant women in the age group of 18-35 years belonging to three different socio-economic groups.
2. To study the impact of dietary intake of pregnant women on neonatal outcome.

### MATERIALS AND METHODS

A community-based cross-sectional study was conducted during the month of December 2010 – August 2011 among pregnant women in Chennai District, Tamil Nadu State, India. In total, 196 pregnant women in last trimester in the selected hospitals (Sanjeevini Nursing Home and Nagamani Hospitals) were enrolled for the study. They were categorized into low, middle and high socio-economic groups with the sample size of 65, 65 and 66 respectively and the required information was collected. Data were collected on the socio-demographic and nutritional profile by utilizing a pretested questionnaire in a structured way. The interview schedule included demographic data, dietary habits, dietary pattern, food taboos among the subjects and nutrient intake.

Nutritional status serves as an indicator of health and well-being. So the present study also attempted to assess the nutrient intake of subjects through dietary assessment.

Dietary assessment included food frequency questionnaire and three day dietary recall method. Food frequency questionnaire was used to find out the frequency of eating fast foods, carbonated beverages, health supplements and commonly consuming foods stuff based on the food groups. Information on the total cooked amount of each preparation was noted with standardized cups, the intake of each food item by the subjects was recorded by the researcher. Cooked intake

was converted to its raw equivalents. Nutrients were calculated from the food consumed by the study group and the results were compared with RDA.

The subjects were interviewed on Food taboos which are prevalent in society and life style patterns which included walking and other physical activity with its frequency including certain types of food and avoiding certain types of food during pregnancy like including saffron and avoiding greens during night, eggs and green banana.

## RESULTS AND DISCUSSION

The study revealed that 50% of the total samples selected fell in the age group of 21 – 25 years. Of the 196 respondents, 44.6% from low income group, 47.7% from middle income and 51.5% from high income group were belonging to the age group of 21 – 25 years. Pregnant women who had completed graduation in low income group were found to be 44.6%. Majority of the subjects were found to be house wives (79.9%, 78.5% and 69.7% from low, middle and high income). About 52.3% of low and middle income women and 56.1% of high income women were belonging to joint family. On the other hand, majority of the pregnant women were from small sized family (53.8%, 47.7% and 65.2% from low, middle and high income).

Majority of the women were non-vegetarian (87.7% from low income, 96.9% from middle and 92.4% from high income group). A shocking revelation of skipping meals was observed among expectant mothers and it was 10.8 % from low income and 9.2% from middle income group.

More than half of the subjects (60.6%) of high income pregnant women consumed ragi once a week, but it was only 21.5% in case of low income women. Spinach was included daily by 59.1% of high income women and twice a week by 43.1% of the low income respondents, while 36.9% of the middle income women included spinach only once in a week. Among the low income women, 67.7% of the women included drumstick leaves twice in a week, whereas 6.1% of high income women included drumstick leaves daily. Few of the high income women included guava twice a week (21.2%) and once a week (59.1%). Food consumption and its frequency vary with different ethnic groups.

Table 1 depicts the mean nutrient intake of the selected pregnant women. There was a significant difference between the nutritional status and the income level at 1% level. The table projects that the nutrient intake of pregnant women from all income groups was deficit when compared with RDA. But the nutrient intake of women belonging to high income group was almost near to RDA.

**Table 1**  
Comparison of nutrient intake of pregnant women with RDA

Nutrient	RDA	Low income (n=65)		Middle income (n=65)		High income (n=66)	
		Mean ± SD	't'	Mean ± SD	't'	Mean ± SD	't'
Carbohydrate (g)	413	360.9±31.7	14.230**	380.6±23.8	12.863**	399.5±46.6	8.795**
Protein (g)	82.2	40±44.4	4.536**	36±7.6	30.351**	44.3±12.7	13.176**
Fat (g)	30	30.3±6.3	0.423NS	31.6±5.5	2.361*	37.4±7.0	8.546**
Iron (mg)	35	21.9±6.8	18.939**	23.4±6.3	18.317**	26.2±5.5	17.110**
Vitamin A (µg)	6400	892.22±686.668	17.703**	919.74±607.676	19.639**	1129.85±1206.986	8.549**
Calcium (mg)	1200	738±266	7.924**	745±246	8.318**	1005±330	0.142NS
Energy (Kcal)	2250	1858±176	14.450**	1950±144	12.576**	2132±177	1.992*

\* Significant at 5% level

\*\* Significant at 1% level

NS – not significant

The mean calorie intake of low, middle and high income women were found to be 1858 kcal, 1950 kcal and 2132 kcal respectively. High income women reported with mean protein intake of 44.3g, but it was only 40 g and 36 g in case of low and middle income women respectively due to economic constraints. As far as iron intake was concerned, the mean intake was 21.9 mg, 23.4 mg and 26.2 mg among low, middle and high income groups respectively. In the present study, it was found that most of the pregnant women avoided eating green banana, greens during night, curd, papaya, egg.

**Table 2**  
Correlation between nutritional intake of mother and neonatal anthropometry

Nutritional Intake of mother	Neonatal Weight	Head Circumference
Carbohydrate (g)	0.110NS	0.111NS
Protein (g)	0.030NS	0.013NS
Fat (g)	0.065NS	0.058NS
Iron (mg)	0.041NS	0.053NS
Vitamin A (µg)	0.079NS	0.148(*)
Calcium (mg)	0.009NS	0.018NS
Energy (Kcal)	0.087NS	0.082NS

\* Significant at 5% level

NS – not significant

Table 2 brings the association between the nutritional intake of mother and neonatal anthropometry and it shows no significant difference between carbohydrate, protein, fat, iron, calcium, energy intake and neonatal weight and head circumference. There was a significant difference between Vitamin A intake and that of the head circumference of the neonates at 5% level. This was not surprising because the mean daily intake of energy and other nutrients was almost equal to the dietary reference values.

## CONCLUSION

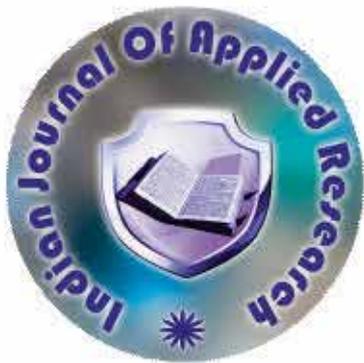
Maternal socioeconomic status affects mental and physical well-being which has been associated with maternal nutrition and pregnancy outcomes (Aydemir F, 2003). Nutritional status of women has been considered an important prognostic indicator of pregnancy outcomes (Winkvist A, 2002). The use of dietary patterns might help us to capture some of the complexity of diet that may be lost in nutrient-based analysis and provide additional information when exploring the relationship between nutrition and disease (Jacques and Tucker, 2001).

Maternal nutritional status had a relationship with the socio-economic background of the family. Based on family income the purchasing capacity of foods may also vary and thus it may have an influence on nutritional status of pregnant women in all the three groups. But the impact of maternal nutritional status on the neonatal outcome failed to show a significant association. Health education programme should be popularized among the people and more particularly among

the women and finally study of the dietary pattern and nutritional status should be conducted at intervals to monitor the impact of health and nutrition programme.

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