A study of nutritional adequacy of pregnant women: A hospital survey

***Swati Singh, **SangitaDeodiya**

*Guest faculty, Department of Home Science, MGKVP, Varanasi
**Associate Professor, Department of Home Science, VKM, Kamachha, Varanasi

Abstract

Nutrition is an area that requires special attention during pregnancy. Nutrition during pregnancy is a significant public health concern. Maternal nutrition and health is considered as the most important regulations of human fetal growth. Therefore an appropriate eating pattern is essential throughout pregnancy to ensure a healthy pregnancy and baby (Pickel*et al.*, 2005). Social class have also been found to correlate significantly with dietary habit and hence nutrient intake especially among pregnant women. In the present study, 246 samples upto 24 weeks of pregnancy were selected as per the inclusive and exclusive criteria by using the purposive sampling technique which is a type of non- probability sampling. In urban habitat, the intake of calorie (1812.50±223.15 kcal), protein (46.82 ± 6.49 gm), iron (17.62 ±2.06 mg), calcium (566.62 ±123.04 mg) and folic acid (200.85 ± 24.00 µg) was found to be higher than the intake of calorie (1612.01±222.75 kcal), protein (41.51 ± 4.84 gm), iron (15.84 ±1.51mg), calcium (457.17 ± 69.78 mg) and folic acid (184.87 ± 12.88 µg) in rural habitat. Fat intake was found high in rural (36.96 ±2.75gm) than urban (35.13 ±3.12 gm) habitat. It was observed that the intake of calorie, protein, iron, calcium and folic acid was found maximum in high socio-economic status (1944.21±160.40 kcal, 51.57±5.67 gm, 19.15±1.54 mg, 642.69±95.35 mg and 221.73±21.19 µg respectively), minimum in low socio-economic status (1575.54±223.52 kcal, 40.95±4.74 gm, 15.49±1.43 mg, 447.70±66.31 mg and 181.93±9.78 µg respectively). Fat intake was noted to be maximum in low socio-economic status (37.47±2.59 gm) and minimum in high socio-economic status (34.20±3.50 gm).

Key words: Nutrition, Pregnancy, Habitat, socio-economic status.

Introduction

Pregnancy is a demanding physiological state. In India, it is observed that diets of women from the low socioeconomic groups are essentially similar during pre-pregnant, pregnant and lactating periods. A woman normal nutritional requirement increases during pregnancy in order to meet the needs of the growing fetus and of maternal tissues associated with pregnancy. There is an increased demand for energy and for almost all energy nutrient type. Pregnancy is characterised by additional energy requirements of approximately 350 kcals per day. Additional 0.5 g of protein during first trimester and 6.9 g during second trimester and 22.7 g during third trimester of pregnancy are required. Some micronutrients are specially required in extra amounts during these physiological periods. Folic acid, taken throughout the pregnancy, reduces the risk of congenital malformations and increases the birth weight. The mother as well as the growing foetus needs iron to meet the high demands of erythropoiesis (RBC formation). Calcium is essential, both during pregnancy for proper formation of bones and teeth of the offspring. Similarly, iodine intake ensures proper mental health of the growing foetus andinfant (NIN, 2010). The caloric needs are not evenly distributed throughout pregnancy. In early pregnancy, it is minimal but rises sharply towards the ends of the first semester and then remains more or less constant for the second and third semesters (Bamji et al., 2004). Proper dietary balance is necessary to ensure sufficient energy intake for adequate growth of the fetus without drawing on mother's own tissues to maintain her pregnancy (Mridula, 2003). Various studies have documented that micronutrient deficiency affect growth and lead to low birth weight and pregnancy complications (Pathak P and et. al., 2004, Seshadri S., 2001). Iron is the most extensively investigated micronutrients that are considered lacking in the diets of pregnant women. This because anaemia, attributable to iron deficiency is a major problem in developing countries and even in developed countries (WHO, 1992) and iron deficiency with or without anaemia is reported to affect about 25% of the poorer pregnant women. Unique to iron is also other micronutrient such as folic acid.

In India, majority of mothers are poor and malnourished. Maternal and infant mortality rates are high (57 infant mortality per 1000 live births, UNICEF, India) compared to other developing countries. In the light of this fact, we need to improve the health of antenatal mothers in improving the health status.

Social class have also been found to correlate significantly with dietary habit and hence nutrient intake especially among pregnant women.A person's socio-economic status is usually defined by their income, level of education, and occupation.Socio-economic status is clearly a determinant of health.

Mustapha et al. (2010) reported that women from lower socio- economic status had higher prevalence of undernutrition than women from higher socio-economic status. Energy intake of the pregnant women was found to be lower than RDA (81.8%).

The present study aims at assessing the nutrient adequacy ratio of pregnant women living in different socio-economic classes and different habitat.

Material and methods

In the present study, 246 samples upto 24 weeks of pregnancy were selected as per the inclusive and exclusive criteria by using the purposive sampling technique which is a type of non- probability sampling. All sampled were initially interviewed, then counselled and provided with educational material. Nutrient intake of respondent was assessed using 24 hour dietary recall method and then nutrient adequacy ratio was calculated.

Result and discussion

1. Distribution of respondents of different habitat according to mean nutrient adequacy ratio

Nutrients	Mean nutrient adequacy ratio	Habitat						Statistical significance
		Rural		Urban		Total		
calorie		No.	%	No.	%	No.	%	χ^2= 24.159, df=2, P<0.01
	<50 %	4	3.8	-	-	4	1.6	
	50-75%	59	56.2	43	30.5	102	41.5	
	75-100%	42	40.0	98	69.5	140	56.9	
Protein	<50 %	41	39.0	23	16.3	64	26.0	χ^2=17.704, df=2, P<0.01
	50-75%	64	61.0	115	81.6	179	72.8	
	75-100%	-	1.0	3	2.1	3	1.2	
Fat	75-100%	-	-	2	1.4	2	0.8	χ^2= 1.502, df=1, P>0.05
	>100%	105	100.0	139	98.6	244	99.2	
Iron	<50 %	90	85.7	63	44.7	153	62.2	χ^2= 43.097, df=1, P<0.01
	50-75%	15	14.3	78	55.3	93	37.8	
calcium	<50 %	102	97.1	89	63.1	191	77.6	χ^2= 40.130, df=1, P<0.01
	50-75%	3	2.9	52	36.9	55	22.4	
Folic acid	<50 %	105	100.0	134	95.0	239	97.2	χ^2= 5.365, df=2, P>0.05
	50-75%	-	-	6	4.3	6	2.4	
	75-100%	-	-	1	0.7	1	0.4	
Total		**105**	**100.0**	**141**	**100.0**	**246**	**100.0**	

The above table shows mean nutrient adequacy ratio among rural and urban respondents during baseline study. It was evident that maximum respondents (56.2%) of rural habitat were having calorie adequacy ratio between 50-75% but in urban area, maximum 69.5% respondents was found between 75-100% of calorie adequacy ratio. Protein adequacy ratio between 50-75% of recommended level was observed in majority of respondents (81.6%) of urban habitants. Statistically, there was significant difference found between the respondents of both habitats for calorie and protein adequacy ratio (P<0.01). On the other hand, fat intake exceeded the recommended dietary allowances in 100% respondents of rural and 98.6% respondents of urban habitat and the association was found to be statistically insignificant. Below 50% adequacy of iron, calciumand folic acid was found in 85.7%, 97.1%and 100.0%respondents of rural habitat respectively. Below 50% adequacy of calciumand folic acid was found in 63.1% and 95.5%respondents of urban habitat respectively but iron intake was found between 50-75% in majority of urban respondents (55.3%). The association was significant (P<0.01) for calcium and iron adequacy ratio and insignificant for folic acid adequacy ratio. In a study provided by Vijayalaxmi, A.H.M., and Kadapatti,Manjula., 2011, it was analysed that nutrient intake between the urban and rural respondents indicates that except for nutrients like fat, calcium, both the groups were found to have insufficient intake of all other macro and micro nutrients. On the other hand, this study is in variance with the study conducted in west north of Iran in 2008 where rural mothers have better nutritional status than their urban counterparts.

2. Distribution of respondents of different socio-economic status according to mean nutrient adequacy ratio

Nutrients	Nutrient adequacy ratio	Socioeconomic status								Statistical significance
		High		Middle		Low		Total		
		No.	%	No.	%	No.	%	No.	%	
calorie	<50 %	-	-	-	-	4	4.5	4	1.6	
	50-75%	4	13.8	43	33.6	55	61.8	102	41.5	χ^2= 38.019, df=4, P<0.01
	75-100%	25	86.2	85	66.4	30	33.7	140	56.9	

Protein	<50 %	1	3.4	22	17.2	41	46.1	64	26.0	χ^2= 32.909, df=4, P<0.01
	50-75%	27	93.1	104	81.2	48	53.9	179	72.8	
	75-100%	1	3.4	2	1.6	-	-	3	1.2	
Fat	75-100%	2	6.9	-	-	-	-	2	0.8	χ^2= 15.008, df=2, P<0.01
	>100%	27	93.1	128	100.0	89	100.0	244	99.2	
Iron	<50 %	3	10.3	69	53.9	81	91.0	153	62.2	χ^2= 68.330, df=2, P<0.01
	50-75%	26	89.7	59	46.1	8	9.0	93	37.8	
calcium	<50 %	9	31.0	94	73.4	88	98.9	191	77.6	χ^2= 60.711, df=2, P<0.01
	50-75%	20	69.0	34	26.6	1	1.1	55	22.4	
Folic acid	<50 %	25	86.2	125	97.7	89	100.0	239	97.2	χ^2= 17.525, df=4, P<0.01
	50-75%	3	10.3	3	2.3	-	-	6	2.4	
	75-100%	1	3.4	-	-	-	-	1	0.4	
Total		**29**	**100.0**	**128**	**100.0**	**89**	**100.0**	**246**	**100.0**	

Above table shows the mean nutrient adequacy ratio of respondents in different socio-economic status during baseline study.86.2% respondents of high socioeconomic status and 66.4% respondents of middle socioeconomic status were having the calorie adequacy ratio between 75-100%.93.1% respondents of high socio-economic status, 81.2% respondents of middle socioeconomic status and 53.9% respondents of low socio-economic status were having protein adequacy ratio in the range of 50-75%.Fat intake was found to be more than recommended level in all socio-economic groups. But in high socio-economic group, 6.9% respondents were involved in eating fats and oil between 75-100% of RDA. Below 50% of adequacy of iron in 91.0% respondents, calcium in 98.9% respondents and folic acid in 100.0% respondents was observed in respondents of low socio-economic status.Less than 50% adequacy of folic acid was found in majority of respondents of all socioeconomic groups ie 86.2% respondents of high, 97.7% respondents of middle and 100.0% respondents of low socio-economic status.

The association was found highly significant (P<0.01) in all socio-economic classes with all the nutrients.These findings were closely related with the study of Dur-E-Afshan, (2000) who suggested that pregnant women from high socioeconomic status and living in urban areas were mostly used to take good diet and their red blood cell count, were more normal than women from rural areas.Similar findings were observed in an another study provided by Mustapha, R.A., et.al.,(2010), who reported that women from low socioeconomic status had higher prevalence of undernutrition than women from high socioeconomic status.

Conclusion

There was found low mean nutrient adequacy ratio among pregnant women. There were various reasons behind the lowermean nutrient intake. The most important was socio-economic status and their education. In spite of better education and highly monthly income of respondents who belonged to high social status, mean nutrient intake was lower than RDA. The fat intake was found high and approximately same during the overall study process as they were including fast food and street food in their diet and were preparing daily meal by using oil more than the recommended amount. This might have been due to poor knowledge on nutrition and ignorance about being healthy by these women.

References

1. Dur, E. Afshan., (2000). Prevalence of Anemia in Multiparous Pregnant Women of Low and High Socio-Economic Status. M.Sc. Thesis Deptt: Rural Home Economics. Univ. Agri. Faisalabad. Pakistan Journal of Nutrition, 11 (7): 568-573, 2012 ISSN 1680-5194.
2. Seshadri, S. (2001). Prevalence of micronutrient deficiency particularly of iron, zinc and folic acid in pregnant women in South East Asia. Bri J Nutr, 85(2):S87–S92.
3. Mridula, D., Mishra, C.P., &Chakravorty, A. (2003). Dietary Intake of Expectant Mother Indian, Nutr Diet, 40(1):24-30.
4. Pathak, P., Kapil, V., Kapoor, S.K., Saxena, R., Kumar, A., Gupta, N.,….Singh, R. (2004). Prevalence of multiple micronutrient deficiencies amongst pregnant women in a rural area of Haryana. Indian Journal of Pediatrics, 71: 1007-1014.
5. Mustapha, R.A., Ademulegun, T., &Ogundahunsi, G.A. (2010). Effect of some Socio-economic Factors on the Nutritional Status of Pregnant and Lactating Women in Rural Communities of Owo Local Government Area of Ondo State, Nigeria. Nigerian Journal of Nutritional Sciences, Vol 31, No 1.
6. Nutrient Requirement and Recommended Dietary Allowances for Indians. A Report of the Expert Group of the ICMR 2010. India. National Institute ofNutrition:Hyderabad.http://icmr.nic.in/final/RDA-2010.pdf (accessed 15/3/2014).
7. Vijayalaxmi, A.H.M., Kadapatti, Manjula. (2011). A comparative study on nutritional status of selected pregnant. Journal of Golden Research Thoughts, 1(1):1-4.