A Case Study on Protein Intake of Pregnant Women Residing in Western Part of Uttar Pradesh and its Effect on their Haemoglobin Level

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ABSTRACT

Objective: This study was carried out to evaluate the protein intake of pregnant women with different demographic features residing in western part of Uttar Pradesh and its effect on their haemoglobin level. **Method:** A total of 200 pregnant women were studied, using purposive sampling. **Results:** The protein intake of pregnant women was very less than the recommended dietary allowances. The mean intake was 50.4 grams/day *i.e.* 77.5% of RDA (ICMR 1989) for pregnant women leading sedentary lifestyle. Protein intake of pregnant women does not depend significantly on their occupational status, locale or religion whereas literacy, family income, food habit and meal pattern have significant effect on dietary protein intake of pregnant women. The haemoglobin level of pregnant women depends significantly on their protein intake. Pregnant women consuming protein less than 50 grams /day had Hb level below 10 grams/dl. **Conclusion:** Pregnant women need guidance in selecting protein dense foods to improve maternal and foetal health and nutritional status to avoid common nutrition related morbidities during pregnancy. This emphasised on requirement of a proper counselling system, so that proper nutrition counselling and education could be given.

Key Words : Protein intake, Pregnant women, Haemoglobin level

INTRODUCTION

From the beginning of human existence, what woman eats during pregnancy has received special emphasis. The incidence of nutritional deficiency as a result of dietary habits and patterns in pregnancy is higher during this stage when compared to any other stage of the life cycle. Dietary practice is defined as a behaviour of dietary habit and can be classified as good dietary practices and poor dietary practices. Protein is vital for fertility, as it helps the body to supply amino acids, needed for building cells, producing healthy hormones and thus creating a healthy reproductive function. The normal protein requirement of adult women is one gram/kg body weight. During pregnancy, the ICMR has recommended an additional 15 grams/day. The additional protein is required to meet growing tissue demands. Anemia is one of the most common complications related to pregnancy. Normal physiologic changes in pregnancy affect the haemoglobin level (Hb), and there is a relative or absolute reduction in Hb concentration.

Review of literature :

Malnourished mothers are more vulnerable to diseases, encounter more miscarriages and give birth to underweight children whose survival is at risk (ACC/SCN, 1990 and Chasi, 1969). Low protein diets are associated with adverse outcomes of pregnant. Especially if the intake is less than 50 grams per day with increased maternal morbidity (Wynn and Arthur, 1991). High protein intake (20% of total energy) may have adverse effects on birth weight and should be avoided (Rush *et al.*, 1980 and Rush, 1989)).

In a study the nutritional status of 171 pregnant

Indian woman from lower income levels were examined. There was a significant difference in the dietary intake of carbohydrate and calcium between the second and third trimester of pregnancy. The carbohydrate intake increased as pregnancy progressed ($P \leq 0.05$) and the calcium level decline ($P \leq 0.10$). Muslims and Christians tend to have similar dietary intake. The Hindus had the lower nutrition intake for protein, fat, calories and calcium (Matter and Wakefield, 1971).

An Hb level of 11 gr/dl in the late first trimester and also of 10 gr/dl in the second and third trimesters are suggested as lower limits for Hb concentration (Sifakis and Pharmakides, 2000).

METHODOLOGY

A study was carried out to evaluate the protein intake of pregnant women residing in western part of Uttar Pradesh with different demographic features and effect of protein intake on their haemoglobin level.

Sample selection:

The sampling procedure that was adopted for the present study was purposive sampling in which respondents were chosen from the whole population based on purpose of the study, so that a good representative sample fulfilling the research objectives can be obtained. The sample size was 200 pregnant women in 2nd trimester of their pregnancy without any chronic illness and common pregnancy ailments like morning sickness, constipation, heart burn etc. so that proper intake can be calculated.

Tools:
Demographic information questionnaire:

A personal information questionnaire was developed in order to seek the detailed background information like Age, Religion, Occupation, Family income, Month of pregnancy, locale and educational level and protein intake of pregnant women through 24-hour dietary recall method.

– The age group was classified under categories 19-28, 29-38 and 39-48 yrs.

– The religion of pregnant women was classified under Hindu, Muslim and others where others include Christians and Sikh

– Occupation status was classified under working women and non-working.

– In three categories family income was distributed LIG (less than 25,000 per month), MIG (25,000-75,000)

and HIG (more than 75,000 per month).

– As the samples were in 2nd trimester of their pregnancy so, they were distributed under 4th, 5th and 6th month of their pregnancy.

– Respondents were categorised under urban and rural locale.

– The educational level was categorised under primary, secondary and graduate/professional categories.

– A questionnaire covering the 24-hour dietary recall was prepared with different food choices and a standard exchange list was used to measure the serving size.

Procedure of data collection:

After identifying the subjects and taking their consent, according to their convenience and willingness to take part in study, the subjects were asked to fill questionnaire and give measurement and data related to their nutritional status. A consent form was signed individually by the respondents.

RESULTS AND DISCUSSION

Table 1 indicate the demographic profile of the pregnant women. Out of 200 pregnant women 39% were under the age group of 19-28 years of age and majority 51% were under the age group 29-38 years. The mean age for pregnant women was 39.65 years. Regarding month of pregnancy maximum 56.5 % woman were under fifth month of pregnancy whereas a smaller number of pregnant women were in their fourth (14.5%) and sixth (29.0%) month of pregnancy.

The non-working pregnant (59%) woman out numbered the working (41%) pregnant women may be due to their family income, religion or locale. Around 50% respondent belonged to middle income group whereas 41% comes under lower income group. Only 9% respondents were with strong financials. Nearly three-fourth (73.5%) of the pregnant women were Hindu and 17% pregnant women belongs to Muslim religion. More than half of the pregnant women (58%) were graduate/professionals, only 12% were less than primary education level. Pregnant women who were studied out of them 69.5% were residing in urban area whereas 30.9% respondents were from rural area.

According to ICMR 1989, recommended dietary allowances (RDA) of protein intake of Indian pregnant women for sedentary worker is (50+15 grams/day), whereas actual intake of respondents was very less than

Table 1 : Demographic profile of the pregnant women		
Demographic information	No. of Respondents	Percentage (%)
Age		
19-28	78	39.0
29-38	102	51.0
39-48	20	10.0
Month of pregnancy		
Fourth	29	14.5
Fifth	113	56.5
Sixth	58	29.0
Occupation		
Working	82	41.0
Non-working	118	59.0
Family income		
<25,000	82	41.0
25,000-75,000	100	50.0
>75,000	18	9.0
Religion		
Hindu	147	73.5
Muslim	34	17.0
Others	19	9.5
Literacy		
Illiterate	0	0
Primary	24	12.0
Secondary	60	30.0
Graduate/professional	116	58.0
Locale		
Rural	61	30.5
Urban	139	69.5

status, locale or religion whereas literacy, family income, food habit and meal pattern have significant effect of dietary intake of pregnant women.

Protein intake of pregnant housewives was slightly more than pregnant working women. But the difference was not significant pregnant working women and pregnant housewives both consume less amount the protein then recommended for their condition.

Urban pregnant women and rural pregnant women both consume nearly same amount of protein. The availability of basic sources of protein like milk, curd, dal, paneer, soyabean eggs, meat etc. in urban as well rural locale help urban pregnant women and rural pregnant women to select the most preferable source of protein they want to consume.

In present era food choices are not bounded by religion and cultural values. Protein intake of Hindu pregnant women and Muslim pregnant women do not differ significantly as Hindu pregnant women were also consuming animal proteins like eggs and meat with plant proteins as Muslim pregnant women.

Professionals/Graduate pregnant women consume more protein than primary or secondary educated pregnant women. Better knowledge about importance of protein for foetal growth and development can be the reason of this significant difference.

It was found that more amount of protein was consumed by Middle Income group pregnant women then low-income group pregnant women and high-income group pregnant women. Fast food and a low protein food items were consumed more by low-income group pregnant women and high-income group pregnant women. Middle income group pregnant women preferred more homemade food items rich in protein and other nutrients.

In comparison to vegetarian pregnant women, eggetarian pregnant women and non-vegetarian pregnant women consumed more proteins. They had more food choices as source of protein then vegetarian pregnant women who basically consume low biological value protein.

the recommended allowance. The mean intake was 50.4 grams/day *i.e.* 77.5% of RDA. The RDA of sedentary worker was taken for comparison because when working level of pregnant women was analysed, it was found that most of the pregnant women were falling under sedentary work level as with pregnancy their work load was lowered by family members and occupational colleagues

Various factors affecting the protein intake of pregnant women:

Table 3 reveals that protein intake of pregnant women does not depend significantly on their occupational

Table 2 : Protein intake of the respondents			
Protein intake	No. of Respondents	Percentage (%)	Average intake
Protein (g)			
40-50	118	59.0	
50-60	60	30.0	50.4 g/respondents
60-70	18	9.0	
70-80	4	2.0	

Table 3 : Various factors affecting the protein intake of pregnant women

Factors		Protein intake (grams/day)				Total	Chi square
		40-50	50-60	60-70	70-80		(χ2)
Occupation	House Wife	68	32	14	4	118	
	Working	50	28	4	0	82	6.292
Total		118	60	18	4	200	
Locale	Urban	77	48	10	4	139	
	Rural	41	12	8	0	61	7.531
Total		118	60	18	4	200	
Religion	Hindu	89	46	10	2	147	
	Muslim	17	11	4	2	34	9.392
	Others	12	3	4	0	19	
Total		118	60	18	4	200	
Education level	Primary	22	2	0	0	24	
	Secondary	32	22	4	2	60	14.436[*]
	Graduate/Professional	64	36	14	2	116	
Total		118	60	18	4	200	
Family income	Less than 25000	58	20	4	0	82	
	25000-75000	56	30	10	4	100	20.126[**]
	More than 75000	4	10	4	0	18	
Total		118	60	18	4	200	
Food habits	Vegetarian	64	26	4	2	96	
	Eggetarian	27	23	6	0	56	13.545*
	Non-Vegetarian	27	11	8	2	48	
Total		118	60	18	4	200	
Meal pattern	3-4	74	18	8	2	102	
	5-6	42	38	10	2	92	19.601[**]
	More	2	4	0	0	6	
Total		118	60	18	4	200	

Where, * = 5%level of significance   ** = 1%level of significance

Pregnant women following 5 to 6 meal pattern consumed more proteins, then pregnant women following 3 to 4 meal pattern. Pregnant women who were consuming 5-6 meals per day focused mainly on their protein intake as in every meal, they try to include at least one protein rich food item than pregnant women consuming 3-4 meals.

Data of Table 4 revels that as the protein intake of pregnant women increases their Hb level also raises. Majority of pregnant women consuming protein less than 50 grams protein/day had Hb level below 10 grams/dl.

A healthy and varied diet is important at all times in life, but particularly so during pregnancy. The maternal diet must provide sufficient energy and nutrients to meet the mother's usual requirement, as well as the needs of growing foetus, and enable the mother to lay down stores of nutrients required for foetal development as well as for lactation. It is also repeatedly reported that dietary practices can be influenced by culture, socioeconomic and environmental determinants (Veronika *et al.,* 2013, Teller and Yimar, 2000 and Central Statistical Authority [Ethiopia] and ORC macro, 2000). In the present study,

Table 4 : Protein intake on pregnant women and their Haemoglobin level

Haemoglobin (Binned) (grams/dl)	Protein intake (grams/day)				Total	Chi square (χ2)
	40-50	50-60	60-70	70-80		
Below 10	43	12	0	0	55	
10 -12	75	46	16	4	141	23.639**
Above 12	0	2	2	0	4	
Total	118	60	18	4	200	

Where, * = 5%level of significance   ** = 1%level of significance

the protein intake of the majority of mothers was insufficient. The mean protein intake of majority of pregnant women residing in western region of Uttar Pradesh was 50.4 grams/day *i.e.* 77.5% of RDA. 59% of pregnant women were consuming less than 50g/day that showed significant effect on their Hb level.

It is concluded from the findings of this study that pregnant women need to increase their protein intake and guidance in selecting protein rich food sources. Moreover, the results of this study emphasize on the importance and requirement of a proper counselling system, so that proper nutrition counselling and education could be given.

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