

Efficacy of Post-Natal Nutrition Counselling on The Nutrient Intake and Haematological Profile of Rural Lactating Punjabi Mothers

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ABSTRACT Sixty rural Punjabi women aged between 18-33 yrs from low socio-economic group were selected from three villages of Ludhiana district during first month of lactation. The subjects were divided equally into Experimental (E) and Control (C) groups. Nutrition counselling was carried out in vernacular through lectures, demonstrations, visual aids etc. to the E group. Inadequate intake of cereals, pulses, fats and oils were observed during I and II month of lactation in both the groups. Average energy intake in E and C group was 2248, 1934 Kcal and 234, 2009 Kcal during I and III months, respectively. All the subjects consumed diets inadequate in calories, fats, iron, riboflavin, niacin and folic acid but adequate in protein, calcium, retinol equivalents, thiamine and ascorbic acid. The mean Hb levels in the two groups were 11.7 ± 0.8 , 9.5 ± 0.5 and 11.9 ± 0.7 , 9.9 ± 0.4 g/dl during I and III months, respectively. It was observed that haematological profile improved significantly ($P < 0.03$) in the E group during III month. Though there was significant ($P < 0.05$) improvement in the nutritional status of the subjects, but it did not meet the recommendations. It could be due to low income, illiteracy, large family size, low availability of foods etc. There should be multiprolonged nutrition counselling programme, keeping in view the cost benefit analysis and severe financial constraints in the developing countries especially in rural areas.

Infants are the wealth of nation, therefore utmost care should be exercised to promote their health and to protect them from various diseases. Overall development of a child is determined by the type and quality of nourishment it receives right from the conception and adequacy of breast feeding during infancy (Moo's, 1980). Serious dietary deficiencies in this period may damage the health, inhibit growth, drain physical strength and possibly retard the mental development (Bhatt and Khetarpal, 1983). In India malnutrition is the biggest single cause of high maternal and infant mortality rate in low income group. Data

shows that Infant Mortality Rate (IMR) in India and Punjab are 53 and 41 per thousand live births, respectively. The maternal mortality rate is less than 1 and 4 per thousand, respectively. It has also been observed that 8% children die before attaining the age of one year (Health Information of Punjab, 1994).

In developing countries like India, even the usual diet of a woman is found to be inadequate, so any state of nutritional stress, like lactation may aggravate chronic dietary deficiencies. The condition responsible for producing malnutrition continues to affect her and the offspring. Thus a vicious intergenerational cycle of poverty and undernutrition is set up (UNESCO, 1983).

Nutrition counselling is one of the most effective tool of changing the food habits of the people without effecting their sentiments. It is the process by which beliefs, attitudes, environmental influences and knowledge about food and health are channelised into actual practices which are sound and consistent with individual needs, purchasing power, food availability and socio-cultural background. Keeping this in view, the present study was undertaken to explore relationship between nutrition counselling and nutritional status of lactating mothers and hence the present communication.

METHODOLOGY

Selection of Subjects : A sample of sixty rural lactating mothers in the age group of 18-33 years from three villages belonging to low socio-economic group were selected during first month of lactation. The subjects were divided equally into two categories of Experimental (E)

and Control (C) groups. The subjects in the E group were imparted nutrition counselling for three months. The subjects in the C group were not imparted nutrition counselling.

Dietary Survey : A complete record of the food intake of each subject was kept by "24 hr recall method" for three consecutive days using standardised containers during I and III month of lactation. Nutrient intake was calculated with the help of composition tables (Rao et al., 1993).

Clinical Examination : It included information on the symptoms of nutrients deficiency especially of iron, ascorbic acid and vitamin B complex etc.

Biochemical Assessment : A series of haematological investigations like Haemoglobin (Hb), Packed Cell Volume (PCV), RBC Count, Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin (MCH) were carried out during I and III month of lactation

Nutrition Counselling (NC) : Nutrition counselling was imparted by three group and two individual contacts for five months about the balanced diet, nutrient requirements during lactation, anaemia etc. The teaching was carried out in vernacular through lectures, discussions, participatory demonstration and visual aids were used to make learning sessions interesting and effective.

Statistical Analysis : The results were analysed statistically in the computer. For comparison of nutrient intake and haematological profile by the two groups, two means t-test values were analysed.

RESULTS AND DISCUSSION

The demographic information of the subjects in the present study revealed that the average per capita income was Rs. 252/- and Rs.220/- per month in E and C groups, respectively. Maximum number (63.3%) of the subjects had four children in both the groups. Majority of the deliveries (83%) were conducted natural in both the groups and carried out by Auxillary Nurse Midwife (ANM) or trained *Dais*. Perera and Lwin (1984) reported that only 4.9 per cent deliveries in rural India were conducted by doctors and the rest were con-

ducted by ANM's or trained *Dais*. It was also seen that 10 and 13.4 per cent of the subjects had the history of one abortion in E and C groups, respectively.

I. Food Consumption By The Subjects : The data in table 1 shows that the mean daily intake of cereals during I and III months was 366.6 ± 37.8 , 269.2 ± 24.3 and 307.0 ± 13.5 , 265.2 ± 10.4 g in E and C groups, respectively. Inadequate intake of pulses, fats and oils was observed during I and III months in both the groups. Adequate intake of green leafy vegetables, other vegetables, roots and tubers, sugar and jaggery, milk and milk products was adequate in both the groups during I and III months of lactation. Butter milk was the most common milk product consumed by lactating mothers in both the groups, as it was available at free of cost in the villages. The subjects also believed that lactation volume could be promoted by drinking a lot of butter milk. The above results indicated that during I and III month the intake of cereals, pulses, fats and oils was grossly inadequate in both the groups due to their poor purchasing power. Similar results were also reported by Devadas et al. (1983) and Kaur and Sehgal (1991).

II. Nutrient Intake By The Subjects : The mean daily nutrient intake during I and III months are presented in table 2. The average daily energy intake during I and III months were 2248 ± 106 , 1934 ± 76.5 and 2234 ± 107.5 , 2009 ± 98.40 Kcal by the subjects belonging to E and C groups and was lower than the recommendations suggested by ICMR (1989) in both the groups. Average consumption of protein was statistically ($P < 0.01$) higher in E group during I and III month. Similar findings were also reported by Finley et al. (1985) and Hira et al. (1988). The average daily consumption of calcium was 1700 ± 195.6 , 1290 ± 102.4 and 1934 ± 13.9 , 1412 ± 94.6 mg in both the groups during I and III months, respectively. The increase between E and C groups was statistically significant ($P < 0.01$) in III month of lactation. It could be due to adequate intake of milk and milk products. The mean daily intake of iron was 25.9 ± 1.7 , 21.1 ± 1.5 and 24.3 ± 0.84 , 21.4 ± 0.79 mg in E and C groups for I and III months, respectively and it did not meet the

Table 1 : Average daily food intake and percentage adequacy of food compared with RDA

Food items	Experimental (E) n=30		Control (C) n=30		RDA(g)	t-value
	Mean±S.E.	% adequacy	Mean±S.E.	% adequacy		
First Month						
Cereals	366.6±37.8	61.0	269.2±24.3	52.8	510*	2.166*
Pulses	44.2±1.6	47.6	30.3±2.8	40.5	75*	4.313*
Green leafy vegetables	138±12.7	138.0	100±8.4	100.0	100*	2.496*
Other vegetables	92.6±7.4	231.5	70±6.5	175	40*	2.496*
Roots and Tubers	87.5±7.3	175.5	63.5±6.5	127	50*	2.455*
Milk and milk products	475±25.6	190.0	405±18.7	178	250*	2.208*
Fats and oils	27.3±1.2	78	24.1±0.5	69	35*	2.423*
Sugar and jaggery	31.5±3.9	105	26.4±3.7	181.5	30*	0.921 ^{ns}
Third Month						
Cereals	307.0±13.5	60.2	265.2±10.4	52	510	2.000
Pulses	47.8±2.4	41.1	29.6±1.5	39.5	75	6.431
Green leafy vegetables	122.5±8.4	102.5	100.2±6.5	100.2	100	2.100
ther vegetables	88.1±6.3	170.4	66.0±5.7	165.2	40	2.599
Roots and Tubers	94.7±8.6	189.5	73.3±5.6	186.6	50	2.090
Milk and milk products	500±37.6	200	398.7±30.6	195.5	250	2.080
Fats and oils	29.2±1.2	83.5	26.4±0.3	75.5	35	2.280
Sugar and jaggery	37.6±3.4	125.6	36.1±2.9	120.4	30	0.331

a - ICMR (1981) ** - Significant at 1% level * - Significant at 5% level NS - Non-significant

Table 2 : Average daily nutrient intake of the subjects

Nutrients	Experimental n=30	Control n=30	RDA (a)	t-value
	Mean±S.E.	Mean±S.E.		
First Month				
Energy (Kcal)	2248±106.4	1934±76.5	2775	2.396*
Protein (g)	79±2.50	70±2.10	75	2.757**
Visible fat (g)	36±1.40	32±0.90	45	2.403*
Calcium (mg)	1700±145.60	1290±102.40	1000	2.303*
Iron (mg)	25.9±1.70	21.1±1.54	30	2.093*
Retinol eq(µg)	2185±167.90	1691±145.30	950	2.225*
Thiamine (mg)	3.0±0.27	2.3±0.17	1.4	2.069*
Riboflavin (mg)	1.8±0.14	1.4±1.1	1.6	2.415*
Niacin (mg)	18±1.10	13.5±1.24	18.0	2.715**
Folic acid (µg)	93.3±7.60	60.7±4.60	150	2.664*
Ascorbic acid (mg)	217.6±17.30	172.2±12.5	80	2.127*
Third month				
Energy (Kcal)	2234±107.50	2000±98.40	2776	2.287*
Protein (g)	71±4.20	60±3.20	75	2.083*
Visible fat (g)	36±1.60	32±0.67	45	2.306*
Calcium (mg)	1934±134.90	1412±94.60	1000	3.168**
Iron (mg)	24.3±0.84	21.4±0.79	30	2.515*
Rational eq. (µg)	1951.3±145.70	1439.2±139.50	950	2.539*
Thiamine (mg)	2.7±0.18	202±0.09	160.1	142.385*
Riboflavin (mg)	1.6±0.06	1.45±0.04	1.6	2.219*
Niacin (mg)	18.4±1.10	14.2±1.14	18.0	2.626**
Folic acid (µg)	86.2±7.60	60±3.64	150	3.115**
Ascorbic acid (mg)	168±12.50	140.3±4.90	80	2.063*

a - ICMR (1989) * - Significant at 5% level ** - Significant at 1% level

ICMR recommendations. Similarly low intake of iron had also been reported by Kaur and Sehgal (1991). The mean daily intake of retinol equivalents was 2185 ± 167.9 , 1691 ± 145.3 and 1951.3 ± 145.7 , 1439.2 ± 139.5 μg during I and III months in both the groups, respectively. Higher intake of retinol equivalents and ascorbic acid might be due to more consumption of green leafy and other vegetables, because these were grown in the fields where majority of the husbands of respondents worked as labourers. Further, with the impact of nutrition counselling the subjects were convinced to take better nutrition and adapt better cooking and feeding practices.

III. Clinical Manifestations of Nutrient Deficiency: Clinical symptoms of nutrient deficiencies have been given in table 3. The data revealed extensive prevalence and anaemia (46.5, 53.5 and 33.1 and 66.9 per cent) in E and C groups during I and III months, respectively. Symptoms of vitamin B complex deficiency like angular stomatitis, cheilosis, glossitis, anorexia were observed in both the groups. These deficiencies may be attributed to poor dietary status during pregnancy and lacta-

tion in both the groups. The symptoms in the E group decreased during III month as they consumed lots of sprouted and fermented foods in their diet which was taught during nutrition counselling programme.

IV. Biochemical Assessment of The Subjects: The data in table 4 showed that the mean Hb, HCT, RBC count, MCV and MCH during I month was 11.7 ± 0.8 and 9.5 ± 0.5 g/dl, 33.8 ± 1.7 and 27.1 ± 1.5 per cent, 3.7 ± 0.24 and 3.1 ± 0.12 , 91.8 ± 2.8 and 83.9 ± 1.6 m^3 , 33.4 ± 2.3 and 34.1 ± 2.9 Pg, respectively in E and C groups. An improvement in all the values of blood parameters was noted in mothers belonging to both the groups during III month, though there was significant ($P < 0.05$) improvement in the subjects belonging to E group during III month. This could be due to better nutrient intake and impact of nutrition counselling. Similar findings have also been reported by Ahmed et al. (1984) and Devi et al. (1989).

The data in the present study have indicated that majority of the subjects consumed diets inadequate in calories, visible fat, iron, folic acid, riboflavin and niacin in both the groups, whereas adequate intake of protein, calcium,

Table 3 : Distribution of subjects on the basis of clinical symptoms

Symptoms/Sign	First Month				Third Month			
	Experimental (n=30)		Control (n=30)		Experimental (n=30)		Control (n=30)	
	N	%	N	%	N	%	N	%
A. Anaemia								
(i) Pale conjunctiva	3	10.00	6	20.0	2	6.6	4	13.3
(ii) Paleness of skin	6	20.0	21	70.0	4	13.3	19	63.3
(iii) Flat nails -								
a) Toes	2	6.6	5	16.7	2	6.6	4	13.3
b) Fingers	2	6.6	4	13.3	2	6.6	4	13.3
(iv) Koilonychia -								
a) Toes	1	3.3	1	3.3	-	-	-	-
b) Fingers	-	-	1	3.3	-	-	1	3.0
Total	14	46.5	38	53.5	10	33.1	32	66.9
B. Angular Stomatitis	1	3.3	4	13.3	-	-	2	6.0
C. Cheilosis	2	6.6	2	6.6	1	3.3	2	6.0
D. Glossitis	-	-	2	6.6	-	-	2	6.0
E. Anorexia	2	6.6	4	13.3	-	-	2	6.0
F. Bleeding gums	-	-	2	6.6	-	-	3	10.0
G. Xerosis of skin	10	33.3	14	46.6	9	30.0	12	40.0
H. Mottled enamel	1	3.3	3	10.0	2	6.67	2	6.60
I. Constipation	2	6.6	6	20.0	1	3.3	5	16.0
J. Acidity	6	20.0	7	23.3	5	16.6	6	20.0

Table 4 : Haemopoietic indices of lactating mothers

Blood Analysis	Experimental (n=30) Mean $\pm$ S.E.	Control (n=30) Mean $\pm$ S.E.	Normal values	t-value
<i>First Month</i>				
Haemoglobin, Hb (g/dl)	11.7 $\pm$ 0.8	9.5 $\pm$ 0.5	12	2.332*
Haematocrit, PCV (%)	33.8 $\pm$ 1.7	27.1 $\pm$ 1.5	32-38	2.955
Red Blood Cells Count RBC $\times$ (10 ⁶ mm ³)	3.7 $\pm$ 0.24	3.1 $\pm$ 0.12	4.0-5.5	2.311*
Mean Corpuscular Volume MCV (m ³)	91.8 $\pm$ 2.8	83.9 $\pm$ 1.6	75-95	2.450*
Mean Corpuscular Haemoglobin MCH (Pg)	33.4 $\pm$ 2.3	34.1 $\pm$ 2.9	32-38	0.189
<i>Third Month</i>				
Haemoglobin, Hb (g/dl)	11.9 $\pm$ 0.7	9.9 $\pm$ 0.4	12	2.481
Haematocrit, PCV (%)	34.2 $\pm$ 1.6	27.9 $\pm$ 1.6	32-38	2.784
Red Blood Cell Count, RBC $\times$ (10 ⁶ mm ³)	3.8 $\pm$ 0.21	3.2 $\pm$ 0.14	4.0-5.5	2.496
Mean Corpuscular Volume, MCV (m ³)	92.7 $\pm$ 2.9	84.1 $\pm$ 1.7	75-95	2.558
Mean Corpuscular Haemoglobin, MCH (Pg)	33.6 $\pm$ 2.4	34.6 $\pm$ 2.8	32-38	0.271

* - Significant at 5% level

** - Significant at 1% level

NS - Non-significant

thiamine, retinol equivalents and ascorbic acid was observed. Inadequate nutrient intake might be due to low purchasing power, lack of knowledge, ignorance, illiteracy and less availability of food. The haematological profile of the subjects during I and III months was very poor in both the groups. Narasingha Rao (1983) reported that the main reason of iron deficiency anaemia was low dietary intake coupled with low absorption from habitual Indian diets, the absorption being around 2 per cent.

The perusal of the data clearly indicated that clinical symptoms and biochemical assessment were indicative of the state of undernutrition with respect to energy, iron and folic acid among rural lactating mothers. However, nutrition counselling imparted for three months improved the nutrient and haematological profile of rural lactating mothers.

SUGGESTIONS

Delaying the age of consummation of marriage, smaller family norms and lengthening the interval between successive pregnancy will result in better nutritional status of lactating mothers. Social status of women needs to be elevated, so that they are not deprived or unfavourably discriminated for allocation of scarce food resources. The nutrition counselling programme at community level should be

multiprolonged, keeping in view their cost benefit analysis and severe financial constraints in the developing countries especially in rural areas.

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