

Nutritional Status of Adult Population of Raika Community in Jodhpur, Desert District of Rajasthan

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ABSTRACT In Rajasthan, Raika community in Jodhpur district commonly consumes camel milk, may be helpful in reducing the nutritional deficiencies and morbidities in adult community in addition to diabetes. With this aim, study was designed to assess the nutritional status of adult population of Raika community in Jodhpur district by means of anthropometry, dietary intake, clinical examination and to study the association between nutrition and morbidity, if any. Data collected on 203 adults, who approached camps organized at three villages of Jodhpur district, 2003 and examined for their anthropometry, dietary intake, nutritional deficiency signs and haemoglobin estimation. Proportion and t-test were applied as per their feasibility for application to test the strength of associations. The results of present study revealed that Raika adults suffered from Chronic Energy Deficiency (44.1 %), Vitamin A and B complex deficiencies (3.4 % and 2.4 %) along with anemia (87.7 %). Main morbidities reported at the time of survey were Aches (56.6 %), Gastric complaints mainly abdominal pain (26.1%) and Respiratory (8.8 %). Morbidity showed negative association with personal cleanliness, housing conditions, education and Haemoglobin estimation. Diet analysis showed that Raika adults suffered from calorie deficit but their intake of proteins met the allowances recommended by ICMR indicating proteins are being used for this purpose of providing energy in face of calorie inadequacy leading to malnutrition. It shows that malnutrition does not exist only in children but also in adults. In adults too, the extent of malnutrition is high in Raika community in comparison to comparative group of earlier study. There is strong need of planning nutrition education program for this community to reduce malnutrition and morbidity in this area.

INTRODUCTION

Raika community in Jodhpur district commonly consumes camel milk in their diet, commonly known for keeping camels. There are reports (Lutz Breiting 2002 and Agarwal et al. 2004) that camel milk consumption reduces the occurrence of Diabetes in the community. Agarwal et al. (2004) have shown fasting blood glucose, postprandial blood glucose, prevalence of diabetes as well as prevalence of impaired glucose tolerance to be low in Raika community of western Rajasthan. It has also been shown that camel milk has an adjuvant effect to insulin therapy in control of diabetes (Agarwal et al. 2003, 2005). Raw camel milk against type I diabetes has shown encouraging results and average daily insulin requirements showed a decrease of about 30-40 percent in 92% of patients. Camel milk is therefore believed to have anti-diabetic activity. Camel milk consumption may also be helpful in reducing the nutritional

deficiencies and morbidities in adult community. It is researchable issue which needs to be explored. With this aim present study was designed to assess the nutritional status of adult population of Raika community by means of anthropometry, dietary intake as well as through clinical examination and to study the association between nutrition and morbidity, if any. Their anthropometric measurements were taken to assess the degree and type of malnutrition and to know the prevalence of Protein Calorie Malnutrition (PCM) and prevalence of various morbidities are comparable with the desert population.

MATERIAL AND METHOD

The Raika community is the traditional camel breeder's community. This community is known to consume camel milk in western Rajasthan. This community is spread all over Rajasthan. This community is categorized under OBC category.

Data was collected on 203 adults (18-45+ years) who approached camps organized at three villages i.e. Bhatinda, Salawas and Mogra of Jodhpur district in 2003. At each individual level, information for Demography and Socio-economic aspects had been collected by means of interview

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technique in pre tested schedules. Each individual was examined for their anthropometry (height and weight, and fat fold at tricep), dietary intake (24 hours recall method), clinical examination of nutritional deficiency signs and haemoglobin estimation in order to assess their nutritional status following standard techniques (Jelliffe 1966 and WHO 1989). Haemoglobin estimation was done by Cynmethaemoglobin technique (Filter paper method).

The results of the present study were compared with earlier surveys (Singh et al. 2005), in Jodhpur district i.e. Textile workers project conducted by DMRC (2003). The comparisons were made between male and female for different age groups by applying Proportion Test. In dietary analysis the mean calorie and protein intakes were compared with Recommended Dietary Allowances of Indian Council of Medical Research by applying t-test for difference of means (Snedecor and Cochran 1967).

RESULTS AND DISCUSSION

Analysis revealed that 62.1 percent belong to lower and middle income group mainly involved in labour work and agriculture and 98.2 percent women were illiterate.

In adults Body Mass Index (BMI) is used to assess the chronic energy deficiency using cut off values of WHO classification (WHO 2000). Anthropometrically growth retardation has been observed. Males and females (51.2 and 37.0 %) suffered from chronic energy deficiency (CED) based on BMI (WHO 2000 cut off values). Severe

chronic energy deficiency was high (15.5 % males and 10.9 % females) and needs attention (Table 1). Cumulative percentage distribution of Fat fold at triceps (FFT) showed that 62 to 79 percent adults have nearly 50 percent reduced fat deposits (FFT < 6 mm) in comparison to standards.

Analysis of nutritional deficiency signs showed that overall 61 percent rural population was found to be anemic (diagnosed on the basis of conjunctival pallor and platynichia and koilonichia). Prevalence of various signs related to Protein Calorie Malnutrition (PCM) were low i.e. 2.9 percent (dispigmentation and dryness of hair), observed only in women. Bitot spot was 3.4 percent suggesting Vitamin A deficiency, higher in males (4.7 %) than females (2.5 %). Vitamin B complex (cheliosis) and vitamin C deficiency (gums bleeding) were 2.4 and 0.8 percent. Teeth complaints were high (teeth caries- 18.7 % and mottled enamel - 8.9 % and teeth caries along with mottled enamel -18.7 %).

Results when compared with comparative group of earlier study (Singh et al. 2005), showed that Vitamin A (Bitot spot) and B complex deficiencies (Cheliosis) were higher in Raika adults (3.4 % and 2.4 %) than comparative group where no deficiency of vitamin A was observed and B complex deficiencies (Cheliosis) was 1.5 percent.

Anemia has also been assessed by bio-chemical means i.e. Haemoglobin estimation (cynmethaemoglobin technique by filter paper method according to WHO). Analysis of haemoglobin estimation revealed that 87.7 percent Raika adults were anemic, significantly higher than compara-

Table 1: Distribution of adults (>=18 years) according to BMI classification

Type of family	Normal 18.5-25		CED I 17-18.5		CED II 16-17		CED III <16	
	No.	%	No.	%	No.	%	No.	%
Male N=84	41	48.8	21	25.0	9	10.7	13	15.5
Female N=116	75	63.0	24	20.2	7	5.9	13	10.9
Pooled N=203	116	57.1	45	22.2	16	7.9	26	12.8

**P< 0.01 between M and F

Table 2: Distribution of Raika adults according to anemia (haemoglobin estimation) and its comparison with earlier study

Hb. Grades	Male (N=84)		Female (N=116)		Total (N=203)		Comparative group (350)	
	No.	%	No.	%	No.	%	No.	%
Normal (≥ 12 g/dl)	9	10.7	16	13.4	25	12.3**	150	42.8
Mild (10-12 g/dl)	56	66.7	54	43.4	110	54.2**	138	39.4
Moderate (7-10 g/dl)	19	22.6	42	35.3	61	30.1**	58	16.6
Severe (<7 g/dl)	0	0.0	7	5.9	7	3.4	4	1.1

** P<0.01 Total vs Comparative group

tive group (Singh et al. 2005, 42.8 %, table 2). Females (41.2 %) suffered significantly more from moderate and severe anemia category (below 7 gm/dl) than males (22.6 %).

Sickness at the time of survey was 75.3 percent, significantly higher in females (79.8 %) than males (69 %). Main morbidities reported at the time of survey were Aches, Gastric complaints and Respiratory (56.6, 26.1 and 8.8 %), significantly higher than comparative group (11.6, 8.1 and 7.8 %). General weakness and Fever were 19.2 and 12.3 percent. Aches, Gastric problems and General weakness were significantly higher in female than males (Table 3).

For environmental factors, housing conditions and personal hygiene were recorded. In assessing housing conditions, 10 parameters were considered for the house hold of each worker i.e. type of house, ventilation and light, no. of living rooms, cleanliness, animals kept in the house, kitchen, water supply and adequacy, disposal of refuse and waste water disposal and after scoring the assessment was made as poor, fair and good. In personal cleanliness, 10 parameters were taken i.e. bath, hair, dress, footwear, bowel habit, nail, face, hand washing before meals, hand washing type and louse infestation and after scoring the grading was done. Percent prevalence of morbidity in relation to housing conditions revealed that overall morbidity was lower (3.9 %) in good housing conditions than poor and fair conditions (96.1 %). Morbidity in relation to personal cleanliness revealed that overall morbidity was lower (40.6 %) in adults who had good personal cleanliness than adults who had poor and fair (59.4 %) personal cleanliness. Morbidity was found to be decreasing as

education level increased. Total morbidities were 90.9 percent in illiterate education group and 5.9 percent in college level educated group.

Morbidity in relation to anemia (Haemoglobin estimation) revealed that percent prevalence of overall morbidities were higher in adults suffering from mild to moderate anemia (57.5 % and 26.8 %) in comparison to non anemic adults (12.4 %).

Dietary analysis revealed that calorie deficit was 20.5 percent in males but their diet rich in proteins in comparison to Recommended Dietary allowances (RDA), Indian Council of Medical Research (ICMR) indicating that proteins were being used in providing calories to the body leading to PCM. The study showed that extant of malnutrition was high in Raika community indicating a strong need of planning nutrition education program for this community to reduce malnutrition along with morbidity in this area.

The results of the present study revealed that Raika adults suffered from Chronic Energy Deficiency (44.1 %), Vitamin A and B complex deficiencies (3.4 % and 2.4 %) along with anemia (87.7 %). In NIN studies (Vijayaraghavan et al. 2000; NIN 2003), the prevalence of Chronic Energy Deficiency among adults during drought was observed 43.3 percent in 2000 and 39.8 in 2003. The prevalence of Chronic Energy Deficiency in the studied adult population was higher than NIN studies (Vijayaraghavan et al. 2000; NIN 2003), during drought (2003). Anemia in the studied population was higher in comparison to the studies reported in literature i.e. NIN (MND), 2003 (76.5%) and NFHS-II (2000), (52.0 %) and Singh et al. (2008) (81%).

Main morbidities reported at the time of survey were Aches (56.6 %), Gastric complaints mainly

Table 3: Morbidity profile in adult population of Raika community and its comparison with earlier study
Raika adults: 203 Sick: 153 (75.3 %) Comparative group: 395 Sick: 183 (46.3 %)

Type of Morbidity	Male (N=84)		Female (N=119)		Total (N=203)		Comparative group (N=395)	
	No.	%	No.	%	No.	%	No.	%
Aches	21	25.0	94	78.9*	115	56.6*	46	11.6
GastricProblem	14	16.6	39	32.7*	53	26.1*	32	8.1
G.weakness	13	15.4	26	21.8*	39	19.2*	13	3.3
Respiratory	11	13.0	7	5.8*	18	8.8**	31	7.8
Skin	1	1.2	3	2.5	4	1.9	19	4.8
Eye	1	1.2	1	0.8	2	0.9	11	2.8
Fever	17	20.2	8	6.7	25	12.3	19	4.8
U.R.I	2	2.3	0	0.0	2	0.9	5	1.3
Ear	2	2.4	0	0.0	2	1.0	4	1.0
Others	5	5.9	8	6.7	13	6.4	20	5.1

* P<0.05 M vs F Total vs Comparative group * P<0.05 ** P<0.01

abdominal pain (26.1%) and Respiratory (8.8 %). Morbidity showed negative association with personal cleanliness, housing conditions, education and Haemoglobin estimation. In earlier study (Singh et al. 2005), overall morbidity was significantly higher ($p < 0.01$) in textile workers suffering from anemia (71.3 %) as compare to non anemic (28.7 %) and in good housing conditions, overall morbidity (15.0 %) was significantly ($p < 0.01$) lower than poor and fair conditions (85.0%). Diet analysis also revealed that Raika adults suffered from the calorie deficit (50.5 %), but their intake of proteins met the allowances recommended by Indian Council of Medical Research indicating proteins are being used for this purpose of providing energy in face of calorie inadequacy leading to malnutrition. It shows that malnutrition does not exist only in children but also in adults. In adults too, the extant of malnutrition is high in Raika community in comparison to comparative group of earlier study (Singh et al. 2005). Thus there is strong need of planning nutrition education program for this community so as to reduce the extant of malnutrition along with morbidity in this area.

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