

Quantitative and Qualitative Analysis of Human Milk Proteins in Urban and Rural Mothers of Hyderabad Division.

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The present study was carried out on the lactating mothers during first three months of lactation and in between seven to ten months of lactation to find out any change in amount of proteins. This study included 20 cases of lactating mothers of rural and urban population of Hyderabad district. It was observed that milk of lactating mothers of urban areas during 1-3 months (mean morning 13.56 and 7-10 months is (mean morning 11.9 mg/ml), which contains more proteins as compared to mothers of rural areas (mean morning 11.25 mg/ml) and 7-10 months (mean morning 8.53 mg/ml). This indicates that the women belonging to urban areas contains high amount of proteins in their milk than the rural women.

Key words: Lactation, human milk, milk proteins.

According to WHO reports breast feeding has been the only source of nutrition for the new born babies which is directly or indirectly related to environment and mothers nutritional status. Human lactation is one of several nutritional topics at the center of controversy. It has become so tied up with non-health issues, commercial involvement and the marketing of infant foods that it is difficult to identify and maintain a rational scientific perspective⁸. One of the most important question in pediatric nutrition is the amount of proteins in the human milk which could satisfy the nutritional needs during the first 4-5 months of life. It contains alpha lactalbumin, Beta lactalbumin, lactoferin, lysozyme and Immuno globulins. Much of its protein are as immunoglobulins, which are believed to be absorbed without digestion in the small intestine⁴ and hence protect the new born infant from diseases¹. Milk yield is also correlated with infant birth weight⁹.

It has also been noted that children especially from rural areas are suffering from nutritional disorder². In order to establish this fact, human milk protein determination has been carried out. The present study was carried out in three villages in the vicinity of Hyderabad. Quantitative protein estimation was carried in the milk from lactating mothers of urban and rural population during first three months of lactation and 7-10 months of lactation. The aim of this study is to evaluate the status of protein in the lactating mothers of urban and rural population.

The samples were divided into two categories. In first category the samples and controls were analyzed when the donating mothers were in the phase of first three months of lactation. In second category, when the same mothers were in the phase of 7-10th month of lactation.

Material and method

Milk for analysis was obtained from 20 mothers. Duplicate samples were collected (10 ml each) one in morning and another in evening by using hand pump and kept in a refrigerator at 4°C. Fractionation and analysis of samples were carried out on a subsequent day by using the procedure of Lowry³, which is partially modified by Patton S, and Huston⁵. Human serum albumin (HSA) was used as standard in protein analysis. Donors were asked to yield about 10ml, of milk by means of hand pump. This was immediately stored in the ice box and upon return is refrigerated at about 4°C in order to preserve it for analysis. Absorbance of samples and reference tubes were measured at 500 nm in spectronic 21. Reading for duplicated samples were averaged and mg/ml of proteins in milk was determined by referring the mean sample absorbance to the calibration curve constructed from absorbance of the HSA standards.

Results

Duplicated morning and evening samples of Urban women during 1-3 month of lactation were calculated and the mean, standard deviation, t-test and p-values were obtained. It has been observed that the protein values during the morning are higher than the evening values 13.56 ± 2.5 and 12.5 ± 1.9 respectively (Table-1). Similarly in the Rural women evening values are also lower than the morning values but the mean protein percentage in both cases is considerably lower than the urban women 11.24 ± 1.8 and 10.92 ± 2 respectively (Table 1). The same procedure was employed in later stages when the lactating mothers were in 7-10th month of lactation, the mean protein values were obtained. It is observed that the amount of proteins is decreased considerably than the initial months 11.9 ± 2.8 and 11.37 ± 1.9 respectively.

(Table II). Because of gradual changes in hormones responsible for producing milk. Table III & IV shows the effect of parity, C-section and the diet taken by the urban and rural women.

Discussion

The human milk testing at a larger scale cannot be done because of some reservations in the minds of mothers, and also the composition is not constant, fat content varies with a given feed, time and with stage of lactation. Even after standardization for these variables, some women consistently produce milk with a high average fat content, whereas other women produce low fat milk, the difference being independent of milk volumes^{6,7,9}, so it can be assumed that there must be similar consistent differences between individuals in total energy, protein and other nutrients. The marked difference in protein is due to age, health and number of children and diet also in respect of calories and protein content. Table-1 shows the mean protein values of morning and evening samples, which are significantly higher in urban women. The difference in protein values are due the diet taken by the urban and rural women, although the diet during the initial months in case of rural women is better than the later stage but still does not contain the enough amount of proteins to cover the demand of child. The mean morning and evening protein values during the 7-10th month appear to be lesser than the initial months, but still are significant this is because that the dietary status of mothers is considerably decreased than the initial months, this leads to the physiological reduction in the nutritional values, which is also confirmed by asking questions regarding the diet they are taking. The overall results of rural and urban population, when compared it was found that mean protein values in the human milk of urban population is higher than the rural values, which clearly indicates that urban women are more diet conscious than the rural women. The same is also confirmed by asking questions regarding the diet taken by the urban and rural women during the lactation period. On the other hand number of children (parity) is also related with the amount of protein, since the health of mother depends upon the gap

in between the pregnancies and the number of children, which in case of urban women is lesser than the rural women (Table-III & IV). Since urban women is in a position to maintain health values by taking appropriate nutrition on the advice of doctors right from first day of conception. However a rural women cannot do so because of monetary problems and health cover, due to non-availability of health network. Thus she herself is deprived of many things. First three months are critical for mother and child health but later on when child start taking additional food from external sources, thus partially depends upon the mother. Moreover first three months are very necessary for development of many systems of the body.

Table-I. Determination of Human milk proteins (mg/ml) in urban & rural women during 1-3 month of lactation (morning & evening samples)

Mean \pm S.D.	t-test	p-value
Urban		
Morning 13.560 \pm 2.58	1.02	1.58
Evening 12.508 \pm 1.9		
Rural		
Morning 11.25 \pm 1.8	0.36	0.35
Evening 10.92 \pm 2.0		

Table-II. Determination of Human milk proteins (mg/ml) in urban & rural women during 7-10 month of lactation (morning & evening samples)

	Mean \pm St. Dev	T-test	P-value
Urban			
Morning	11.905 \pm 2.89	0.48	0.3
Evening	11.376 \pm 1.93		
Rural			
Morning	8.632 \pm 1.78	0.53	0.3
Evening	8.25 \pm 1.46		

Thus government is advised to take appropriate measures in health care in both rural and urban on the similar. Present study also revealed that women folklore prefer boys in gaining diet over the girls so that their physical health is affected due to low protein. The tradition in the rural population of Sindh is that after parturition rich fatty diet is given to the mothers in order to gain energy lost during labour but the essential features such as protein and vitamin supplements are neglected.

Table-III. Comparison of Human milk proteins (mg/ml) in lactating others of Urban areas with respect to age, parity and diet.

Age	Parity	Normal/ C-section	Diet	1-3 months		7-10 months	
				Morning	Evening	Morning	Evening
26	2 nd	Normal	Veg	13.65	11.52	17.32	11.75
32	5 th	Normal	Veg./Meat	11.56	11.56	14.12	12.43
32	4 th	Normal	Veg	16.34	10.73	12.60	09.75
35	6 th	Normal	Veg	10.15	15.62	08.13	14.62
28	3 rd	C-section	Veg./Meat	13.55	13.42	15.33	12.73
22	2 nd	Normal	Veg	18.18	11.75	11.45	14.00
20	1 st	Normal	Veg	15.85	14.65	9.32	11.50
22	2 nd	Normal	Veg	13.45	12.92	12.20	10.50
18	1 st	Normal	Veg./	10.66	9.80	08.42	09.70
16	1 st	Normal	Meat	12.20	10.55	11.85	08.65

Table-IV. Comparison of Human milk proteins (mg/ml) in lactating mothers of Rural areas with respect to age, parity and diet.

Age	Parity	C-section Normal/ Normal/	Diet	Morning	Evening	Morning	Evening
26	2 nd	Normal	Veg	11.46	10.56	7.31	6.56
32	5 th	Normal	Veg./Mean	9.81	11.04	9.86	8.78
32	4 th	Normal	Veg	13.72	13.57	7.65	6.85
35	6 th	Normal	Veg	9.36	8.35	11.76	10.35
28	3 rd	C-section	Veg./Meat	14.52	12.85	9.61	10.24
22	2 nd	Normal	Veg	8.91	9.32	6.89	7.12
20	1 st	Normal	Veg	11.35	11.45	10.23	9.00
22	2 nd	Normal	Veg	9.84	9.38	6.21	9.44
18	1 st	Normal	Veg.	10.89	8.50	9.43	7.10
16	1 st	Normal	Meat	12.61	14.20	7.37	7.13

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