ORIGINAL ARTICLE

Maternal and Socioeconomic Risk Factors for Protein Energy Malnutrition Under 5 Years

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ABSTRACT

Aim: Aim of study was to identify the effects of certain maternal and socioeconomic risk factors associated in children less than 5 years of age.

Study Design: Case Control Study

Place and duration of study: Department of pediatrics, WAPDA Teaching Hospital complex Lahore and Asad eye and children clinic from 24.5.2011 to 24.11.2011

Methodology: A total of 100 children were included in which 50 children were selected as cases having 3rd degree malnutrition and weight less than 60% of their expected age (According to modified Gomez classification). For each case an age/sex/socioeconomic status matched child free from malnutrition were taken as controls (having weight more than 80% of their expected age). Anthropometric examination conducted which included measurement of weight, height and head circumference.

Results: The results showed that the most vulnerable age for the development of protein energy malnutrition (PEM) was from 3-12 months(56%), followed by the children with age group up to 24 months (32%).Out of each group 20 were males and 30 were females. Regarding association of gender with PEM, no significant difference was seen. Furthermore lack of breast feeding, improper weaning, maternal education and multi parity have statistical difference in causing malnutrition in children less than 5 years of age.

Conclusion: Better maternal education and child nutrition, social infrastructure and economy are needed to address the child's malnutrition issue.

Keywords: Children, Nutritional Deficiency, malnutrition, socioeconomic

INTRODUCTION

Protein energy malnutrition (PEM) is one of the most important health issue all over the world but specially in developing countries[1] where this is responsible for increasing morbidity and mortality predominantly in children under five years of age[2] and data from UNICEF states that maximum level of poor nutrition is found in south east Asia[3].

The risk factors for protein energy malnutrition are many but important variables are based on complex interaction of biological, cultural and socioeconomic and reproductive factors.[4] Important predictors of under nutrition in young children are economic status of family, lack of knowledge about children's nutrition, mother education, place of living, age of mother, method of feeding, age of start of weaning, birth interval of child, maternal nutritional status and size of the family[5,6,7].

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The etiology of malnutrition is multifaceted. If it is not properly managed it disturbs the immune regulation of child creating a more vicious circle of malnutrition[8].

MATERIALS AND METHODS

For a period of 6 months a case control study was designed in WAPDA teaching hospital Lahore and A total of 100 patients were included in study.

Children in ages 3-36 months with 3rd degree malnutrition having weight less than 60% of expected for age (according to modified Gomez classification) were studied as cases. For each case an age/sex/socioeconomic status matched child free from malnutrition were taken as controls. Low birth weight and children suffering from chronic illness like TB (tuberculosis), liver and kidney infections were excluded from study.

Parents and caretakers of children coming to pediatrics Department WTHC were interviewed regarding feeding of their children, maternal and socioeconomic factors, and recorded on a questionnaire. Physical examination was done and anthropometric measurements recorded. Malnutrition was categorized use weight for age modified Gomez

classification. Two groups of children were made. 50 children(3-36 months) with 3rd degree malnutrition having weight less than 60% of expected for that age (according to modified Gomez classification) controls 50 healthy children having weights more than 80% of expected for that age. The data was entered and analyzed on SPSS.

RESULTS

Out of 100 patients in each of the cases and control group. 20 children were male and 30 were females. The median age, when calculated it was 12 months for the cases and 11 months for the controls. The results showed that Malnutrition frequent in the age group from 3-12 months (56%) followed by children with age group up to 24 months (32%). In the case group, the more frequent presenting complaints were fever, which was present in 47(98%), loose motions in 18(36%) and vomiting 15(31%) of cases. While in the control group 11(22%) of the children had fever and loose stools and 13(26%) presented with chest infections. Past history of nausea, diarrhea was more common in the case group 26(52%) and another 18(36%) had past history of chest infection and 4(8%) had recurrent fever. In the control group only 8(16%) have recurrent attack of diarrhea in the pas, 4(2%) with recurrent fever and none of the them presented with repeated chest infection.

Regarding feeding pattern in the case group, it was seen that 12(24%) were breast fed, 46(92%) had top feed while 42(84%) were consuming diluted milk. Weaning was started in only 19(38%) of the cases where as in the control group, 34 children(68%) were mother fed, top feed was given to only12(24%) of children, 6(12%) having diluted milk and weaning was started in 37(74%) of children.

So there is significant difference between the feeding pattern of cases and the control group.

Certain maternal predisposing factors like maternal education, employment and multi parity were interviewed and recorded in the questionnaire form. Results showed that 39(78 percent) out of 50 mothers were illiterate while 11(22%) were literate. Where as in the control group only 4 out of the 50(8%) were illiterate, while 46(92%) were literate mothers in control group, Chi-square test was applied to these values that shows statistical significance (P value <0.05) .Odds ratio were calculated that shows

that children whose mothers are illiterate are more likely to develop severe PEM than those children whose mothers are literate.

Regarding employment status of mothers of cases, the results showed that 45 out of 50 mothers (90%) were housewives while 5(10%) were skilled or unskilled workers. Whereas in the control group, 38 out of the 50(76%) were housewives while 12(24%) mothers were found to be skilled or unskilled workers. Cross tabulation was made between employment status of mothers and degree of severe malnutrition. Chi Square test was applied to the values that showed no statistical significance between the employment status of mothers of the case and controls. Odds ratio was applied, that shows that employment status of mother is not a risk factor for the development of sever protein energy malnutrition. The results showed that 37 out of the 50 cases (74%) mothers of cases were multi parus where as in the control group 23(46%) had multi parity. Cross tabulation was made between the multi parity of the mothers and the degree of severe malnutrition. It showed that 37% of the mothers of the case have multiparus where as in the control group 23% of mothers was multiparus. Chi Square test was applied to the values, that shows statistical significance between the multiparus of mother and development of PEM (P value <0.05). Odds ratio was calculated that children whose mothers were multiparus have greater risk of development of severe PEM. Effects of family income as an important socioeconomic risk factor was included in the questionnaire form and the results showed that family income of 35 out of 50(70%) of cases has <6000 Rupees while 15(30%) had income more than 6000 rupees. While in the control group, 20 (40%) children were having family income<6000, while 30(60%) were having family income more than 6000 rupees.

Regarding signs of malnutrition, the results showed that skin changes were present in 46 (92%) of the cases, edema 38(76%), vitamin deficiencies 38 (76%) and lymphadenopathy in 38 (76%) and cough in 38(76%) of cases was observed. Whereas in the control group skin changes 8(16%),edema 0(0%),vitamin deficiency 8(16%) and lymphadenopathy in 8(16%) and cough 8(16%) of the controls was present.

Table 1: Comparison of different factors in cases and controls

		Case%	Control%	p-value	Odds ratio
Presenting complaints	Fever	49 (98)	11(22)	< 0.001	173.727
	Lose motion	18 (36)	11(22)	0.029	1.994
	Vomiting	15(31)	9(18)	0.033	2.047
	Chest Infection	12(24)	13(26)	0.744	0.899
	Urinary Complaint	11(22)	5(10)	0.021	2.53
	Fits/drousina	2(4)	0(0)	0.92	5.316
	Skin rash	7(14)	3(6)	0.059	2.55
	Worm infestation	10(20)	5(10)	0.048	2.25
Multiparity	Yes	37(74)	23(46%)	<0.001	3.41
	No	13(26)	27(54%)		
Symptoms	Recurrent Chest Infection	18(36)	0(0)	< 0.001	9.10
	Recurrent Diarrhea	26(52)	8(16)	< 0.001	60.34
	Recurrent Fever	4(8)	4(2)	0.052	4.26
Feeding History	Mother feed	12(24)	34(68)	< 0.001	0.149
	Top Feed	46(92)	12(24)	< 0.001	36.41
	Dilution	42(84)	6(12)	< 0.001	38.5
	Walming	19(38)	37(74)	< 0.001	0.125
Education status	Illiterate	39(78)	4(8)	< 0.001	40.77
	Literate	11 (22)	46 (92)		
Employment	House wives	45(90)	38(76)	0.008	2.84
	Skilled / Unskilled Worker	5(10)	12(24)		
Family Income	<6000 Rs	35(70)	20(40)	< 0.001	3.5
	≥ 6000 Rs	15(30)	30(60)		
Signs	Skin changes	46 (92)	8 (16)	< 0.001	60.35
	Cough	38 (76)	8 (16)	< 0.001	16.62
	Edema	38 (76)	0 (0)	< 0.001	311.08
	Vitamin Deficiency	38 (76)	8 (16)	< 0.001	16.62
	Lymphadenopathy	38 (76)	8 (16)	< 0.001	16.62

DISCUSSION

The study was conducted to identify certain predisposing risk factors for malnutrition in young children. It was observed that infants were more vulnerable to develop malnutrition among children under five years of age as is seen in another study.[9]

Mothers who had history of poor breast feeding and could not continue it till around 6 months, their children suffered more communicable infections and presented with more signs and symptoms of malnutrition.[9-12]

There was a direct relationship between malnutrition and low socioeconomic status regardless of the location. Income insecurity was a possible factor for food insecurities and parents were not frequently giving animal based (high quality) proteins as one of the complimentary foods because they were not affording them. Low family income and large family size was a real stress for family regarding better nutrition management as is consistent with other similar studies[8,9,13-16]

Children who were malnourished belonged more to families with multiparty and reduced inter birth intervals and poor maternal nutrition as is consistent with other studies[17]

Parent education especially maternal status of knowledge regarding awareness of balanced nutrition and its effects on child physical and psychomotor growth plays a vital part in early child's life. In our study we found that children whose parents were well aware of the importance of mother feed, complementary foods, proper hygiene practices, immunization and monitoring child's appetite and growth level were enjoying more healthy life and had less incidence of severe communicable infections. Similar results are found in other studies as well.[18]

In this study we also observed that severely malnourished children acquired more episodes of communicable diseases like fevers, diarrhea and

chronic respiratory infections including pneumonia as seen in other studies.[8,9]

CONCLUSION

The findings of the study confirm the association of severe malnutrition with maternal and socioeconomic risk factors. To reduce the childhood malnutrition due emphasis should be given in improving the knowledge and practice of parents on appropriate infant and young child feeding practices, resources should be created to help child nutrition of low income families, early detection and treatment of children affected by malnutrition should be done to avoid the viscious circle of diarrhea and malnutrition.

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