

PREVALENCE OF PROTEIN ENERGY MALNUTRITION AMONG UNDER-FIVE CHILDREN BELONGING TO RURAL AREAS OF SOUTH 24 PARGANAS, WEST BENGAL

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Abstract

Objective: A study to assess the prevalence of protein energy malnutrition (PEM) among under-five children with various sociodemographic variables which affect the nutritional status among under-five children in selected rural areas of South 24 parganas, West Bengal.

Study Design and Setting: House to house visits by cross-sectional study covering 300 underfive children in rural areas of South 24 parganas, West Bengal. Data analysis consisted of descriptive statistics and inferential analysis of nonprobability consecutive sampling.

Result: According to the Gomez classification, 44.43% had good nutritional status with the proportion of first, second and third degree malnutrition was 39.34%, 15.66% and 0.66%, respectively. A significant association of PEM was determined by the age of the children.

Conclusion: Need to provide health education regarding antenatal diet, the importance of exclusive breastfeeding, importance of immunization among under-five children and development of the integrated child development scheme at the school level.

Keywords: prevalence, malnutrition, protein energy malnutrition (PEM), under-five children, Gomez classification

INTRODUCTION

Protein energy malnutrition (PEM) is possibly a fatal body depletion disorder . The term PEM is related to a group of associated disorders that include kwashiorkor and marasmus. Severe form of malnutrition, associated with the cognitive effect. Mostly affected are the infants and young children because of their high protein and energy needs related to body weight and their particular susceptibility to infection. PEM leads to chronic short- and long- term mental, physical retardation and worse resistant to the infection, and increased death rate among children. Nearly one in five children who are under five years in the developing world is malnourished and it remains to be a major cause of mortality and ill health among children. The



World Health Organization has reported hunger and related malnutrition as the only threat to the world's health problem. Nutritional disorder is the main subsidising factor affecting malnourished children to infections and increased prevalence and prolongation of vomiting and diarrhoea in children. This

happened because the mucosal surfaces are mainly prone to be attacked by microorganisms, and decreased immunity within this age [6]. Malnutrition is the leading cause of the global burden for disease. In developing countries, almost 65% of children under the age of five years are underweight and 50% of these children die as a result of PEM. Most common causes of morbidity and mortality among children is malnutrition in all over world. In Southern Asia and sub Saharan Africa, malnutrition is public health problem in developing world. These countries are having scarcity with diet of micronutrients (vitamin, water, mineral) and macronutrients (fat, carbohydrates, and protein etc.). In developing countries, around 9% of under five children were having muscle wasting, 27.6% were having underweight and 32.5% were stunted . Around 70% of children are delivered by malnutritious mother. Deficiency apart from the single nutrition such as essential fatty acid can cause muscle degeneration and osteoporosis. In developing countries, parasitic and bacterial.diseases contribute greatly to malnutrition. In developing countries more than one quarter of children younger than 5 years of age were malnourished. According to the United Nations Children's Fund (UNICEF), 27% of children with more than 5 years of age in developing countries were suffering from muscle wasting. In Korea, incidence of malnourished children ranges from 3.6% to 21.6%. In middle class families poverty is found to be a major cause of underweight. A well-nourished child has good access to care and food supply. A child will have height and weight measurements that compare very healthy with the standard normal distribution of weights and heights of fit children of the same sex and age. Therefore, the great technique to assess the nutritional status and complete health of a child is to associate the child's development, manifestations with the standard normal distribution of healthy-nurtured children that are related to sufficient growth .

METHODOLOGY

A total of 300 children were taken as the sample from the rural areas of Ambala district, from house to house data collection among under-five children. Data were collected with the help of weighing machine and measuring tape. Diagnosis of PEM was based on the following parameters such as standard height, weight, and head circumference according to the age group.



Semistructure questionnaire contained socioeconomic and demographic information such as question related to age of child, religion, type of family, dietary pattern of family, educational status of mother, occupation of mother, birth order of child through oral interviews of mothers. Data analysis consisted of inferential statistics and descriptive analysis by using nonprobability convenient sampling. Degree of malnutrition was assessed on the basis of Gomez classification. Figure 1 represents the flow diagram of methodology contained in this research.

ANTHROPOMETRIC INDICES

Height, weight, mid arm and head circumference of malnourished children was measured. Gomez classification and biochemical factors deliver the degree of malnutrition among under five year children. PEM. Height was measured in standing position with heels close together with the height board; weight was determined by digital balance and mid arm circumference was measured by placing the measuring tape around the head circumference over the supra orbital and glabella ridges anterior occipital eminence posterior, nearly 2 cm above the ear.



Fig. 1: Schematic Representation of Research Methodology.

RESULTS

Result was found out by applying Gomez classification which is most unique systems for classifying PEM in children, based on percentage of expected weight for age.

Gomez Classification

Weight for age (%) = *Weight of the child* Weight of the normal child in the same age \times 100

90 and 100%: Normal nutritious status

75and 89%: 1stdegree, Mild malnutrition

60-74%: 2nddegree, Moderate malnutrition



N=300

Below 60%: 3rd degree, Severe malnutrition

Table 1 shows that out of 300 cases, 133 cases are found to be normal while 167 cases are of PEM among under-five children.Out of 167 cases of PEM degree of malnutrition was also determined as depicted in Table 2.

Figure 2 indicates that out of 300 children, 44.34% of children havea good nutritional status while 1st, 2nd, and 3rd degree malnutrition were 39.34%, 15.7% and 0.66%, respectively.

Table 3 shows the association of protein energy malnutrition with different seven parameters of sociodemographic variable. According to the finding of study age is one of the associated factor which affect the growth of children because p-value is less than or equal to 0.25. Study conducted in Ethopia also shows that different factors are responsible for the malnutrition.

Table 1: Prevalence of Protein Energy Malnutrition (PEM) Among Under Five Year Children

Sr. no.	Type of Cases	Total number of cases	
			Percentage (%)
1	Normal Cases	133	44.44
2	Cases of PEM	167	55.66

 Table 2: Frequency and Percentage Distribution of Degree of Protein Energy Malnutrition Among

 Under-Five Children.

Sr. no.	Level	Total number of children	
			Percentage (%)
1	Normal Cases	133	44.44
2	1 st degree malnutrition	118	39.9
3	2 nd degree malnutrition	47	15.7
4	3 rd degree malnutrition	2	0.6

DISCUSSION

In the present study, the prevalence of PEM and its relation to the various circumference was determined for the same age, using Gomez classification. The result indicated that out of 300 children only 133 children has a good nutritional status.



Sociodemographic variable	Mean	SD	'F' value	Df	P value
1. Age (in years)					
1-2	75.46	7.4		3,163	
2-3	77.88	7.95			
3-4	76.69	9.33	6.84		0.0031*
Above 4	81.81	6.84			
2. Religion					
Hindu	78.11	8.18			
Muslim	84	1.41			
Sikh	77.96	8.76	0.511		
Christian	0	0	0.511	2,164	0.600 NS
3. Types of family					
Nuclear	76.47	9.17			
Joint	78.79	7.75			
Extended	81.66	5.17	2.20	2,164	0.601NS
4. Dietary Pattern					
Vegetarian	78.96	7.63			
Non vegetarian	76.11	7.63	1.702		0.3382NS
5. Educational status					
of mothers					
Illiterate	80.12	6.53			
Primary	77	8.36			
Secondary	78.98	7.78			
Senior Secondary	77.88	9.05	0 468	4 162	0.759NS
Graduate	77.78	8.35		1,102	
6. Occupation of mother					
Housewife	78.23	8.21			
Employee	78	7.6	—		
Self employeed	71.5	12.02		2,164	
Private employees	0	0	1.319		0.270NS
7. Order of Birth					
First	78.52	8.16			
Second	77.33	8.96			
Third	77.44	7.35	1.25	3,163	0.290NS
Fourth	83.83	3.43	1.25		

*= Significant, **= "t" Test NS =Non-Significant



In the present study, 39.34% of children had first degree, 15.7% had 2nd degree and 0.66% belongs to 3rd degree malnutrition category. The same kind of result was reported by Singh et al. in rural districts of India, among 406 children. The study showed that percentage of malnourished children was 57.4% [20]. At the time of birth, neonates who were very small in size having two times higher risk of being malnourished. The study investigated the risk factor for underweight status among children under 3 years of age in Kerala. The result indicated the significant risk factor for current child underweight status [21]. Mahgoub conducted a study in Botswana and showed that malnutrition is a problem that affect stunting (38.7%), wasting (5.5%), and underweight (15.6%) among children under three years of age[22]. Children of good nutritional status of mother had lower risk of underweight. The present study showed a significant relation with age factor of children for malnutrition. The proportion of stunting and underweight reached a peak level of 81.5% and 45.5%, respectively during 13-24 months of age and then it decreased gradually. Another study also reported prevalence of malnutrition among children within the age group. While other variable such as religion, dietary pattern, order of children, types of family and education status of motherhood are not showing significant relation among children. Different socioeconomic factors lead to the underweight among under-five children. Children are not offered adequate breast milk that also leads to deficient nutrition. A report suggested that the possibility for under nutrition differs from different age groups of children and specially who are living in rural areas are being at a higher risk. Exclusive breastfeeding can also boost good immunity among children. In India, still there is huge gap between mother's awareness regarding exclusive breastfeeding. Delayed initiation of breastfeeding, improper weaning, and deprivation of colostrum is a significant factor for underweight among under-five children. Many mothers breastfeed for 12-24 months, but do not provide exclusive breastfeeding in addition, food not hygienically handled can also lead to the prevalence rate of PEM. Hence incident of diarrhoea and vomiting were common in children. The study showed the difference between rural and urban women's knowledge and attitude about exclusive breastfeeding practices in India, due to difference in age group of mother, education and occupational status of mothers [30]. Women with higher status in the



society have the capability to make decision and helps to develop the proper nutritional status of children.

CONCLUSION

The present study showed that 56% of children were suffering from malnutrition. This result indicated that the majority of population should be concerned about the diet of children from birth to school age group. Hence there is a need to provide health education related to diet in the antenatal period for the mothers, importance of exclusive breastfeeding, and importance of immunization among underfive children. Government of India launched a welfare programme of integrated child development scheme, which provides preschool education, food, and primary healthcare to children under five years of age and their mothers. Another welfare programme, Mid-Day Meal Scheme, was launched to improve the nutritional status of children in classes one through five in government schools. These kind of welfare schemes helps to improve the nutritional level especially for the valuable group of under-five children.



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