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A study on clinical profile of children with protein energy malnutrition

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Abstract

Undernutrition is a condition in which there is inadequate consumption, poor absorption or excessive loss of nutrients. Overnutrition is caused by overindulgence or excessive intake of specific nutrients. Deficiency in macronutrients such as protein, carbohydrates and fat provoke protein-calorie malnutrition (PCM), and when combined with micronutrient deficiencies, they are among the most important nutritional problems with hundreds of millions of pregnant women, elderly and young children particularly affected. This study was carried out in the department of paediatrics, in children between 6 to 60 months of age with protein energy malnutrition. WHO criteria was used to define protein energy malnutrition. Detailed history and systemic examination was done. In our study, fever 86.26%, vomiting 53.55% cough 45.50%, were the most common symptoms. Decreased feeding was present in 36.49% of cases, loose stool present in 35.07% of cases, oedema present in 27.01% weight loss was present in (18.96%) of cases, dyspnea were present in 17.54% of cases, pain abdomen was present in 16.11% and convulsions present in 7.11% of cases.

Keywords: Protein energy malnutrition, undernutrition, children

Introduction

Children are nature's gift and the fountain of life. They are our future and are supremely important asset of nation. The term 'Nutrition' is derived from a Latin word nutritic, meaning nourishment. Mal means any deviation from normal phenomenon. Malnutrition is defined as any deviation from normal nutrition[1].Globally, each year malnutrition is implicated in about 40% of the 11 million deaths of under five children in developing countries and lack of exclusive breast-feeding in infancy causes an additional 1.5 million deaths. Despite the spectacular increase in the food grain production in recent years the problem of chronic malnutrition continues extensively, especially among children of below 6 years old as they are caught in a relentless sequence of ignorance, poverty, inadequate food intake, disease and early death. Undernutrition is still the major problem in our country especially in underserved areas such as urban slums[2].

Protein-energy malnutrition (PEM) may be present at any time during the life cycle, but it is more common in the extreme ages that is, during infancy/childhood and in the elderly. The present review will be restricted mostly to the condition present during infancy and childhood. Protein energy malnutrition in children (PEM) is a pathologic depletion of the body's lean tissues caused by starvation, or a combination of starvation and catabolic stress[3].

Undernutrition is a condition in which there is inadequate consumption, poor absorption or excessive loss of nutrients. Overnutrition is caused by overindulgence or excessive intake of specific nutrients. Deficiency in macronutrients such as protein, carbohydrates and fat provoke protein-calorie malnutrition (PCM) and when combined with micronutrient

deficiencies, they are among the most important nutritional problems with hundreds of millions of pregnant women, elderly and young children particularly affected. Malnutrition is one of the most important underlying causes of child mortality in developing countries, particularly during the first 5 years of life nearly one-third of children in the developing world are malnourished[4].

Nutritional status affects every aspect of a child's health, including normal growth and development, physical activity, and response to serious illness. The establishment and severity of malnutrition depends on the cause, intensity and duration of the nutritional deficiency. Nearly one-third of children in the developing world are malnourished. It is important to reflect on the thoughts of Joaquin Cravioto, a prominent Mexican nutritionist: "The basic origin of malnutrition is to be found in the malfunctioning of society as a whole and the accompanying injustices". Epidemiological and experimental observations have proven that malnourished children are more susceptible to infectious disease; therefore, PCM is considered a strong risk factor for higher morbidity and mortality rates in infectious disease. In children under 5 years of age, malnutrition is responsible, directly or indirectly, for 54% of the 10.8 million deaths per year and contributes to every second death (53%) associated with infectious disease among this age group in developing countries[5, 6].

Methodology

This study was carried out in the department of paediatrics, in children between 6 to 60 months of age with protein energy malnutrition. WHO criteria was used to define protein energy malnutrition. Detailed history and systemic examination was done. The clinical signs of micronutrient deficiency such as bitot's spots, xerophthalmia, keratomalacia and corneal opacities in vitamin A deficiency, glossitis, angular stomatitis, seborrheic dermatitis in vitamin B deficiency, anorexia, pallor, irritability, bleeding from gums and conjunctive in vitamin C deficiency, deformities in forearm, bow legs (genu varum) or knock knees (genu valgum), craniotabes, poor growth in height and weight, frontal bossing of the skull, swelling of the wrist and knees in vitamin D deficiency. Poor physical growth, delayed sexual maturation anaemia, anorexia, diarrhea hair loss dermatitis impaired immune response, poor wound healing in Zinc deficiency was assessed. We looked for clinical evidence of associated infections like acute gastroenteritis, acute respiratory infections, meningitis, sepsis, tuberculosis malaria, measles, skin infections. Investgations was done as and when necessary.

Detailed history, all the clinical findings, investigations was recorded in the pre designed proforma.

Inclusion criteria

- All the children of 6 months to 60 months having protein energy malnutrition according to WHO criteria.

Exclusion criteria

- Children of age < 6 months and >60 months
- Children suspected to have congenital malformation
- Children with genetic disorder including thalassemia.
- Patient party not giving consent for examination.

Ethical clearance

Necessary ethical clearances was obtained from the Institutional Ethics Committee (H), Assam Medical College & Hospital, Dibrugarh.

Case definition

WHO recommendation of malnutrition will be used as case definition. WHO recommends the use of z scores or standard deviation scores (SDS) for evaluating anthropometric data.

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$$\text{SD score} = \frac{\text{Observed value} - \text{Median reference value}}{\text{Standard deviation of reference population}}$$

A score of -2 to -3 indicates moderate malnutrition and a score of less than -3SDS indicates severe malnutrition.The assessment of nutritional status was done according to weight for height (or length), height (or length) for age and presence of edema.

Results

Table 1: Age Distribution

Age Group (*in months*)	**Number (*n*)**	**Percentage (*%*)**
6-12	48	22.75
13-23	50	23.70
24-35	40	18.96
36-47	35	16.59
48-60	38	18.01
TOTAL	211	100.00
Mean ± S.D.	27.33 ± 15.69 months	

In present study majority of cases (23.70%) between 13 to 23 months of age, followed by 6monts to 12 months with 22.75%, followed by 24 to 35 months with 18.96%, followed by 48 to 60 months with 18.01%, followed by 36 to 47 months with 16.59%.

Table 2: Sex Distribution

Sex	**Number (*n*)**	**Percentage (*%*)**	**Ratio (*Male. Female*)**
Male	111	52.61	1.11: 1
Female	100	47.39	
TOTAL	211	100.00	

In the present study, majority of cases 52.61% were males. Male to female ratio was 1.11: 1.

Table 3: Symptoms at Admission

Symptoms	**Number *(n)***	**Percentage *(%)***
Fever	182	86.26
Cough	96	45.50
Dyspnoea	37	17.54
Pain Abdomen	34	16.11
Decreased Feeding	77	36.49
Grunting	3	1.42
Cyanosis	0	0.00
Convulsion	15	7.11
Weight Loss	40	18.96
Loose Stool	74	35.07
Vomiting	113	53.55
Oedema	57	27.01

In our study, fever 86.26%, vomiting 53.55% cough 45.50%, were the most common symptoms. Decreased feeding was present in 36.49% of cases, loose stool present in 35.07% of cases, oedema present in 27.01% weight loss was present in (18.96%) of cases, dyspnea

were present in 17.54% of cases, pain abdomen was present in 16.11% and convulsions present in 7.11% of cases.

Table 4: Feeding Pattern

Feeding Pattern	Number (*n*)	Percentage (*%*)
Solid food only, No B/F or top milk	89	42.18
Top milk + solid food, No breast feed	41	19.43
Breast feed + Top milk + solid food	46	21.80
Breast feeding + solid food	20	9.48
Breast feeding + top milk	5	2.37
Exclusive breast feeding	6	2.84
Breast feeding not started at all	2	0.95

In present study, 42.18% children's are only taking solid food, 21.8% children's were taking only Breast feed, Top milk, solid food.19.43% children's were taking Top milk, solid food, No breast feed.9.48% children's were taking Breast feeding, solid food. 2.84% children's were on exclusive breast feeding.2.37% children's were on Breast feeding, top milk and Breast feeding not started at all in 0.95% children's.

Table 5: Immunization History

Immunization History	Number (*n*)	Percentage (*%*)
Complete	164	77.73
Partial	47	22.27
TOTAL	211	100.00

In present study, 77.73% childrens were completely immunized and 22.27% childrens were partially immunized.

Table 6: Socioeconomic Status

Socioeconomic Class		Number (*n*)	Percentage (*%*)
I	Upper	5	2.37
II	Upper Middle	52	24.64
III	Lower Middle	50	23.70
IV	Upper Lower	35	16.59
V	Lower	69	32.70
TOTAL		211	100.00

In our study, protein energy malnutrition affects most with class v with 32.7%, followed by class II with 24.64%, class III with 23.7%, class IV with 16.59% and lowest with class I with 2.37%.

Discussion

Age is an important predictor of morbidity. In the present study, conducted between the age group of 6 months to five years, majority (23.70%) were 1-2 year of age. When we compare with other studies done by S. Chakraborthy[7] and Arun Kumar Arya[8] in them protein energy malnutrition is more common in 1 to 2 year age group with 80.9% and 43% respectively.

In present study52.61% patients were males and 47.39% were females with sex distribution. Which is similar to the study done by Arun kumar Arya which shows 59% were males and 39% were females affected. And study done by Wammanand RD[9] also shows, protein energy malnutrition affects males (62.5%) compared to females.

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In our study fever, vomiting, loose stool are more common.fever-86%, vomiting 53.55-% and cough 45% which is comparable to other studies done by Choudhary, M[10] which shows fever of 53% vomiting 38% and cough 35%.And In the study done by Chaibi A which shows fever 53.6%, diarrhea 40.8%, weight loss 58.1%, and cough33% were the most common presenting symptoms[11].

In present study, the protein energy malnutrition affects the class IV and V socio economic status the most (49.29%).Similar study done by Mangala, S[12], also shows the more prevalence of protein energy malnutrition in class IV and class V (54.5%).

In present study, the children with protein energy malnutrition grade I (63.98%) is more commonly affected. The similar study done by Mangala S[12] also shows the protein energy malnutrition grade I (26.8%) is more commonly affected.

Conclusion

- The most affected children belonged to the age group of 12-23 months (23.70%).Male's outweighed females with male to female ratio of 1.11; 1.
- Fever, vomiting, loose stool were the most common presenting symptoms.fever-86%, vomiting 53.55-% and cough 45%.

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