

Clinicoetiological profile of children with protein energy malnutrition at tertiary care hospital

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Abstract

Background: Undernutrition is a condition in which nutrients are insufficiently consumed, poorly absorbed, or lost excessively. Overindulgence or excessive intake of particular nutrients are the main causes of overnutrition. Protein-calorie malnutrition (PCM), which is caused by a lack of macronutrients like protein, carbs, and fat, is one of the most significant nutritional issues, affecting hundreds of millions of pregnant women, the elderly, and small children in particular.

Methodology: Children with protein energy deficiency between the ages of 6 months and 5 years old participated in this study at the department of paediatrics. A thorough comprehensive examination and history were performed.

Results: The most frequent symptoms in our study were fever 85.34%, vomiting 49.50%, and cough 42.50%. In children decreased feeding was present in 35.29 percent of cases, loose stools were present in 36.28 percent of cases, oedema was present in 28.04 percent of cases, weight loss was present in 17.96% of cases, dyspnea was present in 17.84 percent of cases, abdominal pain was present in 20.16 percent of cases, and convulsions were present in 7.24% of cases. Prevalence of malnutrition in maximum in Grade II.

Keywords: Malnourished, children, protein energy malnutrition

Introduction

Protein Energy Malnutrition (PEM) is a term used to describe a variety of illnesses caused by a relative or absolute lack of calories and/or protein in the diet. With hundreds of millions of young children being impacted, it is the greatest significant risk factor for sickness and death on a global scale ^[1].

Protein Energy Malnutrition alters the body in several ways, including the haematologic profile of the individual. Protein energy deficiency has always been accompanied by low red cell counts that result in anaemia. These low red cell counts might be macrocytic, microcytic hypochromic, or normochromic. Malnutrition-related anaemia may be caused by a number of conditions, including an iron shortage and/or decreased red blood cell formation as a result of decreased lean body mass. Deficits of erythropoietin, vitamins (folic acid, B12), or trace elements (copper, zinc) as well as infections and chronic illnesses have all been linked ^[2].

Children who are malnourished, a hidden emergency, are unable to realize their full physical and intellectual potential, which delays physical growth and motor development and lowers IQs and causes behavioural issues and social skill deficiencies.

Every element of a child's health is impacted by nutrition, including healthy growth and development, physical activity, and reaction to serious disease. The origin, extent, and persistence of the nutritional shortage determine the presence and seriousness of malnutrition [3].

Kwashiorkor is characterised as malnutrition with edoema, and marasmic kwashiorkor as severe wasting in the presence of edoema. Severe wasting is referred to as marasmus. Various etiological factors such as poverty, unhygienic environments, dietetic habits, customs and beliefs are well known to cause nutritional deficient states, morbidity and mortality [4, 5]. These factors vary from place to place and the contribution made by each, ultimately sums up to affect the overall health status of preschool children in a country. Malnutrition is frequently a cause of sickness, and illness is frequently a cause of malnutrition. This study's objective is to study the clinical and etiological characteristics of Protein Energy Malnourishment in children under the age of five.

Methodology

Children under 5 who were visiting the OPD with protein energy deficiency were the subjects of the study in the paediatrics department. The protein energy malnutrition was determined. The history and clinical finding examination was performed and recorded. The investigations was performed when it was necessary. Various sign of nutrient deficiency was overlooked and examined according to the criteria.

Inclusion criteria

Children age less than 5 years having protein energy nutrients were included in the study.

Exclusion criteria

Child more than 5 years of age were excluded.

Having thalassemia or any malformation were not included in the study.

The height was measured using a non-stretchable measuring tape, and the anthropometric measurements, such as weight, were taken while wearing the fewest amount of clothing possible. Gomez is classified according to weight for age. The 50th percentile of the Boston standard serves as the usual reference child in this approach.

Table 1: Degree of malnutrition according to Gomez classification

| Status of Nutritional | Age according to Wt (% of expected) |
|----------------------------|-------------------------------------|
| Normal | >90 |
| 1 st degree PEM | 75-90 |
| 2 nd degree PEM | 60-75 |
| 3 rd degree PEM | <60 |

Weight for age (%) = (child's weight/normal child's weight at the same age) * 100 Table

Results

In the current study 200 children were enrolled, the maximum cases are between the age of 12 years of age in children, after that 6 month to 1 years followed by 2 years to 3 years with 18.65%, followed by 3 years to 4 years of children with 15.50% and last 4years to 5years of age with 18.50% as shown in table 2.

Table 2: Age distribution with Percentage

| Age group (in years) | Number (n) | Percentage (%) |
|----------------------|----------------|----------------|
| 05-1 | 45 | 22.50 |
| 1-2 | 49 | 24.50 |
| 2-3 | 38 | 19.00 |
| 3-4 | 31 | 15.50 |
| 4-5 | 37 | 18.50 |
| Total | 200 | 100.00 |
| Mean \pm S.D. | 25 \pm 12.44 | |

The male and female ratio in the malnutrition child was 1.12:1. The maximum cases are of male child 52.81% as given in Table 3.

Table 3: Male and Female distribution

| Sex | Number (n) | Percentage (%) | Ratio (Male. Female) |
|--------|------------|----------------|----------------------|
| Male | 110 | 55 | 1.12: 1 |
| Female | 90 | 45 | |
| Total | 200 | 100.00 | |

Table 4: Clinical symptoms observed in children

| Symptoms | Number | Percentage |
|-------------------|--------|------------|
| High temperature | 171 | 85.34 |
| Cold and Cough | 85 | 42.50 |
| Dyspnoea | 36 | 17.85 |
| Weight Loss | 37 | 17.93 |
| Loose Stool | 73 | 36.28 |
| Vomiting | 99 | 49.54 |
| Pain Abdomen | 40 | 20.16 |
| Decreased Feeding | 70 | 35.29 |
| Oedema | 56 | 28.04 |
| Convulsion | 15 | 7.24 |
| Grunting | 2 | 1.18 |
| Cyanosis | 0 | 0.00 |

The most frequent symptoms in our study were fever 85.34%, vomiting 49.50%, and cough 42.50%. According to Table 4, decreased feeding was present in 35.29 percent of cases, loose stools were present in 36.28 percent of cases, oedema was present in 28.04 percent of cases, weight loss was present in 17.96% of cases, dyspnea was present in 17.84 percent of cases, abdominal pain was present in 20.16 percent of cases, and convulsions were present in 7.24% of cases.

Table 5: Immunization record of children

| Immunization | Number (n) | Percentage (%) |
|--------------|------------|----------------|
| Complete | 155 | 77.50 |
| Partial | 45 | 22.50 |
| Total | 200 | 100.00 |

In the current study, 77.50% of children had received all recommended vaccinations, whereas 22.50% had received partial immunization as given in Table 5.

Table 6: Socioeconomic Status

| Socioeconomic Class of children | | Number (n) | Percentage (%) |
|---------------------------------|--------------|------------|----------------|
| I | Upper | 6 | 3 |
| II | Upper Middle | 40 | 20 |
| III | Lower Middle | 44 | 22 |
| IV | Upper Lower | 46 | 23 |
| V | Lower | 64 | 32 |
| Total | | 200 | 100.00 |

According to our study, Table 6 shows that class V suffers from protein energy malnutrition the most (32.0%), followed by class IV (23%), class III (22.0%), class II (20%), and class I (3%).

Table 7: Prevalence of PEM among children of 1 to 5 years

| Degree of malnutrition | Frequency | Percentage |
|------------------------|-----------|------------|
| 75-90 Grade I | 45 | 22.50% |
| 60-75 Grade II | 90 | 45% |
| <60 Grade III | 65 | 32.50% |
| Total | 200 | 100% |

According to the Gomez categorization, Table 7 shows the prevalence of malnutrition levels. Grade 3 malnutrition was present in 32.50% of the population. 22.50% had Grade 1 malnutrition and 45% had Grade 2 malnutrition.

Discussion

Particularly in lower- and middle-income countries, the condition of children's nutrition is particularly low. According to UNICEF data from 2018, although though these nations only account for half of the world's under-five population, they are home to over two thirds of stunted children and nearly three quarters of wasting children^[6]. The most recent statistics on the state of the nation's health were produced by the National Family Health Survey IV (NFHS IV). It's hardly heartening to see how poorly nourished Indian youngsters are. According to this poll, 21% of India's under-five-year-old children are wasted, 36% of underweight children are stunted and 38% are stunted^[7].

The nutritional status of children is a good predictor of the community's overall nutritional profile. Children are especially affected by protein-energy malnutrition because they consume less protein. Diarrhoea is the most typical co-morbidity^[8]. However, a number of additional ailments, including as severe anaemia, bronchopneumonia, TB rickets, and keratomalacia, have been linked to PEM. These co-morbidities burden children who are already malnourished, may extend initial hospital admissions for PEM, and may raise the risk of death. More than one third of children worldwide suffer from protein-energy malnutrition.

Morbidity is significantly predicted by age. The majority (24.5%) of the subjects in the current study, which covered children aged between six months and five years, were infants and toddlers. When compared to earlier studies conducted by S. Chakraborty and Arun Kumar Arya, we find that protein-energy malnutrition is more prevalent in children aged one to two, with respective prevalence rates of 80.9% and 43%. In the current investigation, the patient sex distribution was 55% male and 45% female which is comparable to the study conducted by Arun Kumar Arya^[9], which revealed that 39% of women and 59% of men were affected. Additionally, Wammanand RD's study demonstrates that males are more likely than girls (62.5%) to suffer from protein energy deficiency^[10, 11].

In our study, the most frequent symptoms were fever (85.34%), vomiting (49.50%) and cough (42.50%). which is comparable to other studies conducted by Choudhary, M, which reveal a 53% fever, 38% vomiting, and 35% cough. Additionally, according to a study by

Chaibi A, fever, diarrhoea, weight loss and cough were the four most typical presenting symptoms^[12].

Malnutrition in Grade 3 affected 32.50% of the population in our study. According to the Gomez classification, 22.50% had Grade 1 malnutrition and 45% had Grade 2 malnutrition.

In order to allow more SAM children to be managed at home over the coming years, the Indian government is currently working to strengthen the Integrated Child Development (ICDS) programme, develop national guidelines for community-based management of severe acute malnutrition in India (CMAM), and permit the controlled use of ready-to-use therapeutic food (RUTF) in a number of states. However, it would be challenging to oversee the domiciliary care, especially in rural areas, in a large country like India where there is a shortage of community health workers. For this reason, it is crucial to keep NRCs in operation.

Conclusion

Children between the ages of 1-2 years were the most affected (23.70%). With a male to female ratio of 1.12:1, males were heavier than females. The most frequent initial symptoms were fever, vomiting, and loose stools, and Grade II malnutrition is the most prevalent.

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