

Research Article

Prevalence of protein energy malnutrition among 1-5 years of children in Bellary taluk

Goudappa R. Patil^{1*}, Divyarani D.C.²

¹Department of Pediatrics, ESIC Medical College, Kalaburagi, Karnataka, India

²Department of Pediatrics, Adichunchanagiri Institute of medical sciences, BG Nagara, Karnataka, India

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*Correspondence:

Dr. Goudappa R. Patil,

E-mail: ramspasm@gmail.com

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ABSTRACT

Background: Malnutrition is a major health problem, especially in developing countries. It affects almost 800 million people. Prevalence rates vary among different continents of the world. PEM is undoubtedly the most serious nutritional problem affecting several thousand young children in India.

Methods: A cross sectional study was carried out among 180 children of age group 1-5 years to find prevalence of PEM. Ethical clearance was obtained and permission from respective authorities was also taken. The instrument used is a predesigned and pretested semi structured questionnaire. Physical measurements such as height and weight measured using standard methods.

Results: The prevalence of Protein energy malnutrition is 67.7% (122). The prevalence of PEM is high among rural children (71.1%) compared to urban children (64.4%) and this difference is found to be statistically significant.

Conclusions: Many preventable variables are found to be significant associates of protein energy malnutrition.

Keywords: PEM, Malnutrition, Prevalence, Urban & rural

INTRODUCTION

Lack of nutritious food, poor hygiene and sanitary practice in the household, poverty, illiteracy among mothers and lack of health care only aggravate the problem. Since in rural India these attributes are wide spread, the process of recovering from poor nutritional status in later life is more difficult for these children. Child nutrition is positively influenced by urbanization, female literacy, access to health care, safe water and sanitation.¹ Almost any 'summary index' of the child development indicators would place India at the bottom level of this list.²

Three quarters of the children who die world wide of causes related to malnutrition are described by nutritionists as mildly to moderately malnourished and thus betray outward signs of problem to a casual

observer. Of the 12 million under 5 children who die each year in developing countries the deaths of over 6 million are either directly or indirectly related to malnutrition. Malnourished children are much more likely to die as a result of common childhood disease than those who are adequately nourished. Illness is frequently a consequence of malnutrition and malnutrition is also commonly the result of illness.

Most developing countries have experienced significant decreases in child mortality rates over the last three decades. As greater number of children survive, it becomes critical to pay closer attention to the strong relationship between nutritional status and children's ability to achieve optimal physical growth and psychological development. The effect of what happens during the prenatal period and early months and years of life can last a lifetime.³

In India, since Independence the infant mortality and death rate have come down to one third and half respectively. Unfortunately malnutrition, which is not much talked about, has come down only by one fifth. This is when the agricultural production has increased many fold and granaries are having the problem of storing food grains.⁴

The term "Protein-energy malnutrition is used to describe a broad array of clinical conditions ranging from mild malnutrition manifesting itself in poor growth to serious type of Kwashiorkor and Marasmus, which have high fatality rate. School children are at risk of becoming severely malnourished.⁵ Prevalence rate vary among different continents of the world. More than 70% of children with Protein-energy malnutrition live in Asia, 26% in Africa, and 4% in Latin America and the Caribbean.⁶

Protein-energy malnutrition is undoubtedly the most serious nutritional problem affecting several thousand young children in India. Inadequate food, ignorance, undesirable social practices tend to impede child's early growth. Lack of spacing and large number of siblings are the order of the day amongst low income groups and in rural areas. The present study, therefore, will be undertaken to assess the prevalence of Protein-energy malnutrition in our area.

METHODS

The study was conducted in rural and urban areas of Bellary. Rural areas included village and urban areas included wards. Bellary is a district in northern part of Karnataka state and is around 340 kms away from Bengaluru, capital city of Karnataka. The study population consisted of children of age group 1 – 5 years among households of urban and rural areas of Bellary Taluk.

Exclusion criteria

1. Those not willing to participate in the study.
2. Locked houses at the time of data collection

Sample size is based on level of precision; precision consists of significance level and allowable error. In this study 5% significance and 20% allowable error is considered. According to a study conducted in Chandigarh, the prevalence of PEM was 51.6%.⁷ So the prevalence of 51.6% was taken and the sample size was estimated.

Since the study aims to compare prevalence in urban and rural, 90 each subjects were taken from urban and rural area. So the total sample size was 180.

Method of sampling

Multistage and stratified random sampling

Bellary taluk has urban and rural areas. Urban area includes wards and rural area includes villages.

1. First Bellary taluk was stratified into wards (Urban strata) and villages (rural strata).
2. From rural stratum, village and from urban stratum, ward was selected by simple random sampling using a random table.
3. Further, from each selected village and ward, house to house visit was made and parents/guardians of children aged 1-5 years were interviewed.
4. If required number of children of age group 1 – 5 years was not enough in a selected village or ward, next village or ward was selected and similar procedure was followed.
5. Totally two villages and three wards were chosen for the study.

The questionnaire was presented in the Department for critical review, following which necessary changes were made in the Questionnaire.

Data was collected using Pre tested semi structured Questionnaire by interview technique. The parents of children of age group 1-5 years were informed about the study and each question was explained to gather the data, & simultaneously height, weight, head circumference, chest circumference and mid arm circumference was measured.

The data was analysed in SPSS 15.0 using statistical tests like proportion and chi-square test

The protocol designed for the present study was submitted to the Ethical committee, VIMS, Bellary. Ethical clearance certificate was issued by the institution. Informed written consent was taken by parents/guardians of children.

RESULTS

The age of the study subjects ranged from 12 to 60 months, maximum numbers of children are in the age group of 1-2 years (30.0%) and as well as in the age group 2-3 years (26.7%) which together constituted about 56.7% of study subjects. It was observed that 25.6% of study subjects belong to age 3-4 years and 17.8% belong to the age 4-5 years.

Study subjects included were both boys and girls, boys constituted 43.3% (78) and girls 56.7% (102). There is no much difference in age for 1 – 3 years between boys and girls.

Study subjects included from both urban and rural areas. Each area constituted 50% i.e. urban-50 % (90) and rural-50% (90).

The prevalence of Protein energy malnutrition is 67.7% (122). The prevalence of PEM is high among rural children (71.1%) compared to urban children (64.4%) and this difference is found to be statistically significant.

Table 1: Overall prevalence of protein energy malnutrition among study subjects.

Protein energy malnutrition	Urban	Rural	Total
Present	58 (64.4%)	64 (71.1%)	122 (67.7%)
Absent	32 (35.6%)	26 (28.9%)	58 (32.3%)
Total	90 (100%)	90 (100%)	180 (100%)

Chi-square test-11.92; df-1; p value-0.03

36% of study subjects have Grade I PEM followed by Grade II (24.6%), Grade III (21.4%) and Grade IV (18.0%). Among urban children Grade I (43.1%) is common whereas among rural children, Grade II and III are common. 20.3% of rural children have Grade IV PEM compared to 15.6% of urban children. But this difference was not statistically significant.

Among urban children, Grade I is high in girls (23.4%), Grade II is high in boys (13.7%), Grade III (8.6%) is high in boys and no difference in Grade IV. Among rural children, Grade II is high in boys (15.5%); Grade III (13.7%) is high in boys and no difference in Grade I and Grade IV.

Table 2: Grading of protein energy malnutrition among study subjects.

PEM grading	Urban	Rural	Total
Grade I	25 (43.1%)	19 (29.6%)	44 (36.0%)
Grade II	14 (24.1%)	16 (25.0%)	30 (24.6%)
Grade III	10 (17.2%)	16 (25.0%)	26 (21.4%)
Grade IV	09 (15.6%)	13 (20.3%)	22 (18.0%)
Total	58 (100%)	64 (100%)	122 (100%)

DISCUSSION

A study was conducted to know the prevalence of protein energy malnutrition among 1-5 years of children residing in urban and rural area of Bellary Taluk and along with this objective this study throws light upon determinants of protein energy malnutrition.

The age of the study subjects ranged from 12 to 60 months, maximum numbers of students were in the age group of 1-3 years which constituted about 56.7% of study subjects. It was observed that 25.6% of study subjects belong to age 3-4 years and 17.8% belong to the age 4-5 years. Similar age distribution was found in a study conducted by S chakraboty et al in Rajasthan, India.

Study subjects included were both boys and girls, boys constituted 43.3% (78) and girls 56.7% (102). The proportion of females was higher which is comparable to a study by Bhatia et al.⁹

The prevalence of protein energy malnutrition among 12-60 months age group of children in Bellary Taluk is found to be 67.7% taking the criteria of IAP classification of Protein energy malnutrition. A study done by swami et al on nutritional status of preschool children in Chandigarh was my reference study with a prevalence of PEM to be 51.6%.

The present study revealed that the combined prevalence of PEM is 67.7%. The prevalence of PEM in urban area is 64.4% and in rural area is 71.1%. This shows that prevalence is high in rural area compared to urban area. Comparing the results of this study with other studies in India revealed that the prevalence of PEM is consistent with other studies.^{8,10}

In the present study, 36% of study subjects have Grade I PEM followed by Grade II (24.6%), Grade III (21.4%) and Grade IV (18.0%). Among urban children Grade I (43.1%) is common whereas among rural children, Grade II and III are common. 20.3% of rural children have Grade IV PEM compared to 15.6% of urban children. But this difference was not statistically significant. Grade I PEM (27.7%) & Grade III (16.6%) is more common in 3-4 year age group, Grade II PEM (22.2%) is high in 4-5 year age group whereas Grade IV is more in 2-3 year age group.

In rural children, Grade I, Grade II, Grade III and Grade IV are high in 1-2 year and 4-5 years respectively. Among urban children, Grade I is high in girls (23.4%), Grade II is high in boys (13.7%), Grade III (8.6%) is high in boys and no difference in Grade IV. Among rural children, Grade II is high in boys (15.5%); Grade III (13.7%) is high in boys and no difference in Grade I and Grade IV.

In a study conducted in Rajasthan⁸, prevalence of PEM was observed to be 67%, however it was found to be significantly higher (80.9%) in the age group of 1-3 years as compared to other age groups. This age group also exhibited significantly higher prevalence ($\chi^2 = 14.67$, $p < 0.05$) of Grade I, II, III PEM. Sen et al also reported a higher prevalence in the age group of 1-3 years.¹¹ It was found that in Rajasthan study female had an overall higher prevalence of PEM (70.6%) as also Grade I PEM

(36.6%) in comparison to males who had overall higher prevalence of PEM and Grade I PEM as 62.6 and 19.7% respectively. Contradictory results were reported by Srivastava (1985) as overall higher prevalence among males.¹² However, Grade II, III, and IV PEM was found to be significantly higher ($x^2 = 1.41$, $p < 0.05$) in males (27.4, 10.9 and 4.3% respectively) than in females (23.8, 7.3 and 2.7% respectively) in Rajasthan study.

CONCLUSION

The burden of PEM was very high and therefore, any intervention to prevent and solve the problem of PEM should focus on these high risk groups.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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