

Research Article

A study on factors associated with malnutrition and risk of infections among malnourished children admitted to McGann teaching hospital, Shivamogga, Karnataka, India

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ABSTRACT

Background: Globally, each year malnutrition is implicated in about 40% of the 11 million deaths of under-five children in developing countries. Under nutrition is still the major problem in our country especially in underserved areas such as urban slums and rural areas. So we undertook this study to assess the factors associated with malnutrition and risk of infections among malnourished children.

Methods: Study design: Analytical cross-sectional study. Duration: January 2013 - December 2013 (1 year). 182 malnourished children admitted to department of paediatrics during the study period. Prestructured-pre tested closed ended questionnaire was used to collect the data. The parents were interviewed; case sheets and other records were searched to get the necessary information.

Results: The study was conducted among 182 under nourished children who admitted to department of paediatrics, in the calendar of 2013. Out of 182 children, 80 (43.96%) were boys and 102 (56.04%) were girls. More than 2/3rd (68.6%) under nourished children were in the age group of 0-3 years. Most common co-morbidity found was respiratory tract infection (44%) followed by acute gastro enteritis (22.5%) and fever (Pyrexia of unknown origine- 22.5%).

Conclusion: Children of relatively younger age, from rural areas and girls are the common victims of malnutrition. Respiratory tract infections and acute gastro-enteritis were the common co-morbid conditions found among malnourished children. Nutrition education has to be imparted to the people regarding consumption of cost effective nutritious diet (Emphasize it in Village health and Nutrition day).

Keywords: Malnutrition, Under nutrition, Acute respiratory tract infections (ARIs)

INTRODUCTION

Malnutrition or Protein Energy Malnutrition (PEM) or Protein Calorie Malnutrition (PCM) is a widespread nutritional disease in the developing countries. We all know that 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. Globally, each year malnutrition is implicated in about 40% of the 11 million deaths of under five children in developing countries. Under nutrition is still the major problem in our country especially in underserved areas such as urban slums and rural areas.¹ Children constitute a large and "vulnerable" or special risk group, as 50% of all deaths were occurring during the first 5 years of life in the developing world. The under five children have to cope with the killer triad of diarrheal diseases, respiratory tract

infections, and malnutrition, resulting in high morbidity and mortality.² Ignoring under nutrition puts the long-term health and development of population at risk. India constituting 48%, 43%, and 20% of children under 5 years of age stunted, underweight, and wasted, respectively. The proportion of children who are severely undernourished is also notable - 24%, severely stunted and 16%, severely underweight.³ Mortality rates of under 5 children is 2.5 times higher among moderately underweight and 5 times higher in severely underweight.⁴ Therefore this study was planned to know the burden of malnutrition, types of malnutrition and association of malnutrition with age, gender and common morbidities like acute respiratory tract infection, Acute Gastro-enteritis and other associated morbidities among malnourished children admitted in department of paediatrics, McGann Teaching Hospital, Shimoga.

METHODS

This cross sectional, observational study was conducted on 182 malnourished (Undernourished) children admitted to department of paediatrics, McGann Teaching Hospital attached to Shimoga Institute of Medical Sciences, Shimoga, during January 2013 to December 2013 (1 year). All the diagnosed malnourished children who admitted to the department during above mentioned 1 year were included in the study. The parents were interviewed; case sheets and other records were searched to get the necessary information. Informed consent of the parent or guardian was taken for each case. Parents or guardians who did not give consent were excluded from the study. The data was analysed in Epi-info software. Proportions and Chi-square tests were used to evaluate the association between variables.

RESULTS

The study was conducted among 182 under nourished children who admitted to department of paediatrics, in the calendar year of 2013. Out of 182 children, 80 (43.96%) were boys and 102 (56.04%) were girls (Table 2). Majority 120 (65.9%) of children with under nutrition had come from rural area (Table 3). More than 2/3rd (68.6%) under nourished children were in the age group of 0-3 years. Nearly half (48.35%) of the undernourished children were in the age group of 1-3 years (Table 1). About 64% of the children had either grade-I (17%) or grade-II (47) malnutrition. Sever Acute Malnutrition (SAM) was seen in around 11% of the total malnourished children (Figure 1), who were admitted in Nutritional Rehabilitation Centre (NRC). Common co-morbidities found in our subjects were respiratory tract infection (44%) followed by acute gastro enteritis (22.5%) and fever (Pyrexia of unknown origine-22.5%) (Figure 2). Acute gastro enteritis and Fever were found more in Girls than boys, in contrast to this, Respiratory tract infection was found more in boys than girls (Table 4). But the difference was not significant, indicates both boys and girls who are suffering from under-nutrition are equally

susceptible for above mentioned co-morbidities. Except grade-I, other types of malnutrition were more associated with girls, it was surprising to observe that 85% of the SAM (Grade-IV) were girls (Table 5). Indicates girls are at greater risk of higher degrees of malnutrition, might be because of negligence towards the girl child in India. All the grades of malnutrition were found more in children from rural areas compared to urban areas. This association was found statistically significant (Table 6).

Table 1: Distribution of participants according to age (months).

Age (months)	Numbers	Percent
Up to 12 months	37	20.33%
13-36 months	88	48.35%
37-60 months	40	21.98%
>60 months	17	9.34%
Total	182	100.00%

Table 2: Gender-wise undernourished children.

Sex	Numbers	Percent
Female	102	56.04%
Male	80	43.96%
Total	182	100.00%

Table 3: Distribution of participants according to place.

Place	Numbers	Percent
Urban	62	34.07%
Rural	120	65.93%
Total	182	100.00%

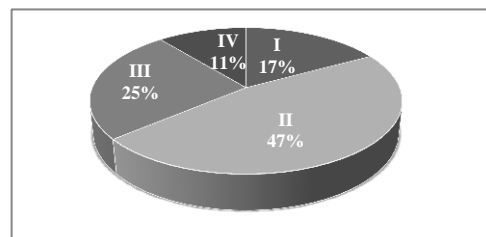


Figure 1: Showing distribution of malnourished children according to IAP classification.

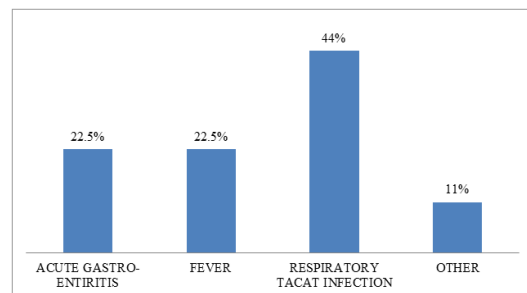


Figure 2: Showing distribution of malnourished children according morbid conditions.

Table 4: Relation between co-morbidities and gender.

Morbidities	Male	Female	Total
Acute gastro-enteritis	14 (17.50%)	27 (26.47%)	41 (22.53%)
Pyrexia of unknown origin	16 (20.00%)	25 (24.51%)	41 (22.53%)
Respiratory tract infections	43 (53.75%)	37 (36.27%)	80 (43.96%)
Others	7 (8.75%)	13 (12.75%)	20 (10.99%)
Total	80	102	182 (100%)

$\chi^2=5.77$, $P > 0.05$, Not significant

Table 5: Relation between gender and grade (IAP) of malnutrition.

Sex	I	II	III	IV	Total
Male	20 (64.52%)	37 (43.53%)	20 (43.48%)	3 (15%)	80 (43.96%)
Female	11 (35.48%)	48 (56.47%)	26 (56.52%)	17 (85.00%)	102 (56.04%)
Total	31	85	46	20	182 (100%)

$\chi^2=12.2$, $P < 0.05$, Significant

Table 6: Relation between place and grade (IAP) of malnutrition.

Grade (IAP)	I	II	III	IV	Total
Urban	13 (41.9%)	21 (24.7%)	19 (41.3%)	9 (45%)	62 (34%)
Rural	18 (58.1%)	64 (75.3%)	27 (58.7%)	11 (55%)	120 (66%)
Total	31	85	46	20	182 (100%)

$\chi^2=8.2$, $P < 0.05$, Significant

DISCUSSION

It is clear from our study that, the prevalence of malnutrition was high in lesser age group, indicates relatively younger children are the common victims of the malnutrition. Similar observations of high prevalence among lower age groups were reported by studies conducted in Chandigarh & Kolkata.⁵⁻⁷ Under nutrition in younger age, especially between 1-3 years is likely to be due to low energy intake, because children are not fed often with enough household food.⁸ About 64% of the children had either grade-I (17%) or grade-II (47%) malnutrition. Severe Acute Malnutrition (SAM) was seen in around 11% of the total malnourished children. A similar observation was found in the study conducted by Veena Algur et al in Karnataka, Bijapur Mohammad Imran, Bangalore.^{5,9} Infections in undernourished children showed that, the relative risk of morbidity due to infections was higher and more consistently seen in children with wasting.⁸ This study clearly shows that girls are at greater risk of higher degrees of malnutrition, might be because of negligence towards the girl child in India. Similar to the results of present study, the study conducted by Garg SK et al. showed that, 57.5 % males and 59% females were malnourished, which was statistically not significant.⁹⁻¹²

CONCLUSION

Children of Relatively younger age, from rural areas and girls are the common victims of malnutrition. Respiratory tract infections and acute gastro-enteritis were the common co-morbid conditions found among malnourished children. Most of the children were in the early stages of malnutrition, a little extra attention and awareness of parents might definitely help to reduce this problem. Nutrition education has to be imparted to the people regarding consumption of cost effective nutritious diet (Emphasize it in Village health and Nutrition days-VHNs). Environmental sanitation has to be promoted in reducing infections and break the vicious cycle of infection leads to under nutrition. Acute respiratory Tract Infections and Acute Gastro-enteritis should be managed as early as possible, as these are the common disease lead to malnutrition.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee of SIMS

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