

ORIGINAL RESEARCH

Assessment risk factors influencing the morbidity and mortality in children with severe acute malnutrition

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ABSTRACT

Background:Severe acute malnutrition is one of the leading causes of morbidity and mortality in children especially in developing world and a great hurdle in accomplishing the Millennium development. The present study was conducted to assess risk factors influencing the morbidity and mortality in children with severe acute malnutrition.

Materials & Methods: 150 Pediatric patients age ranged 5-60 months of both genders were included. Assessment of blood glucose, respiratory rate, heart rate was performed. The assessment of diarrhea and classification of dehydration was done as per the IMNCI guidelines.

Results: Out of 150, males were 80 and female were 70. Out of 150, age group 2-6 months had 60, 6-24 months had 55 and 24-60 months had 35 cases. Exclusive breastfeeding was seen in 45, 35 and 25, partial in 10, 12 and 8 and not breastfeeding in 5, 8 and 2, hospital stay >7 days seen in 45, 30 and 24 and discharged 54, 51 and 32 in patients with age group 2-6 months, 6-24 months and 24-60 months respectively. The difference was significant ($P < 0.05$).

Conclusion: Days of hospitalization and mode of feeding are factors affecting outcome of the treatment in patients with severe acute malnutrition.

Key words: Acute malnutrition, Exclusive breastfeeding, hospitalization.

Introduction

Severe acute malnutrition is one of the leading causes of morbidity and mortality in children especially in developing world and a great hurdle in accomplishing the Millennium development goal 4 i.e. to reduce the mortality in under-fives by two third.¹ A recent assessment showed that efforts to prevent child death need to be strengthened in order to meet the target. The median under five case fatality for severe acute malnutrition typically ranges from 30-50%.²

Severe malnutrition is defined as weight for height z-score $< -3SD$, bilateral oedema of kwashiorkor, or mid-upper arm circumference (MUAC) < 11.0 cm (if > 65 cm in length). Kwashiorkor occurs in infancy but maximally in the second year following abrupt weaning.³ Marasmus involves inadequate intake of protein and calories, representing the end result of starvation. It occurs in the first year of life due to lack of breast-feeding and use of dilute animal milk. Poverty and famine, ignorance and poor maternal nutrition are among the major contributory factors.⁴

Estimates suggest that the prevalence of severe acute malnutrition (SAM) in children below 5 y of age in India is about 6.4%, accounting for nearly 8.1 million children. It may not be feasible to admit all children with SAM for appropriate management due to lack of infrastructure and resources. However, it is seen that majority of the deaths in children hospitalized with SAM usually occur in first 48 hours of admission.⁵ The present study was conducted to assess risk factors influencing the morbidity and mortality in children with severe acute malnutrition.

Materials & Methods

The present study comprised of 150 Pediatric patients age ranged 5-60 months of both genders. Parental consent was obtained from all.

Patients were assessed for airway and breathing, circulation, coma/ convulsion and severe dehydration. Digital thermometer with range 32-42°C was used to measure the axillary temperature. Assessment of blood glucose, respiratory rate, heart rate was performed. The assessment of diarrhea and classification of dehydration was done as per the IMNCI guidelines. Results thus obtained were assessed statistically. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 150		
Gender	Male	Female
Number	80	70

Table I shows that out of 150, males were 80 and female were 70.

Graph I Clinical profile of the children with SAM

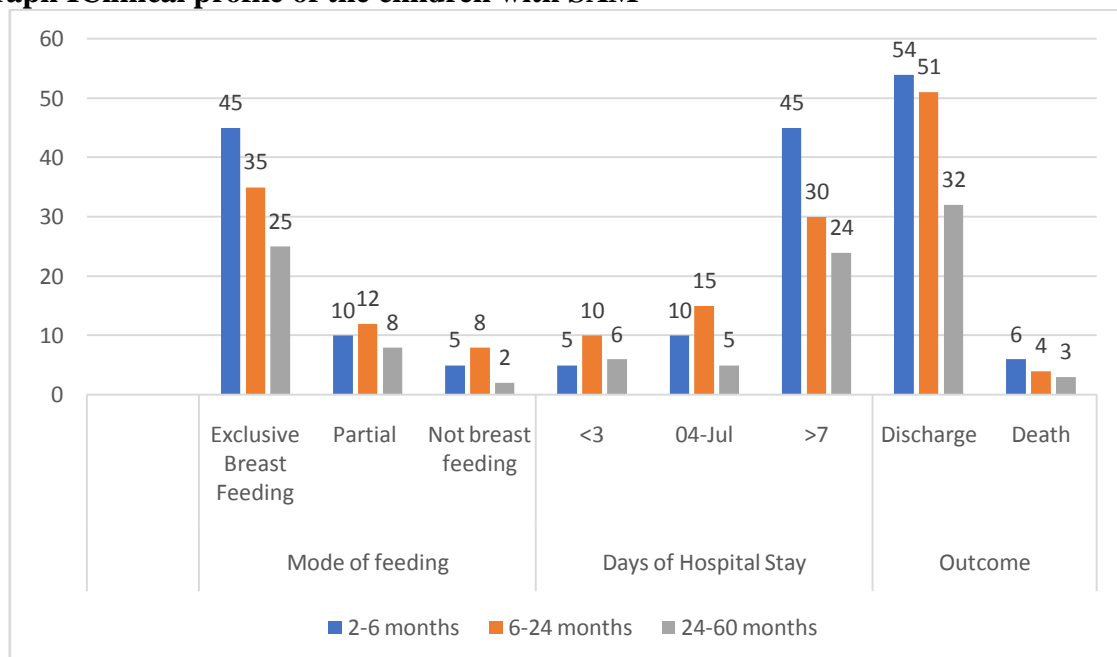


Table II Clinical profile of the children with SAM

Parameters	Variables	2-6 months	6-24 months	24-60 months	P value
Mode of feeding	Exclusive Breast Feeding	45	35	25	0.05
	Partial	10	12	8	
	Not breast feeding	5	8	2	
Days of Hospital Stay	<3	5	10	6	0.04
	4-7	10	15	5	
	>7	45	30	24	
Outcome	Discharge	54	51	32	0.01
	Death	6	4	3	

Table II shows that out of 150, age group 2-6 months had 60, 6-24 months had 55 and 24-60 months had 35 cases. Exclusive breastfeeding was seen in 45, 35 and 25, partial in 10, 12 and 8 and not breastfeeding in 5, 8 and 2, hospital stay >7 days seen in 45, 30 and 24 and discharged 54, 51 and 32 in patients with age group 2-6 months, 6-24 months and 24-60 months respectively. The difference was significant ($P < 0.05$).

Discussion

Globally, malnutrition contributes to about 60% of the 11 million deaths that occur each year among children <-3SD, bilateral oedema of kwashiorkor, or mid-upper arm circumference (MUAC) 65 cm in length).⁶ Kwashiorkor occurs in infancy but maximally in the second year following abrupt weaning. Marasmus involves inadequate intake of protein and calories, representing the end result of starvation. It occurs in the first year of life due to lack of breastfeeding and use of dilute animal milk. Poverty and famine, ignorance and poor maternal nutrition are among the major contributory factors.⁷

The World Health Organization (WHO) gives clear guidelines for the management of children with severe malnutrition, and where standardized management protocols have been followed, mortality has been reduced. However, recent reports suggest that there are problems in initially identifying severely malnourished children at hospital admission.⁸ The WHO defines severe malnutrition requiring hospital admission as weight-for-height z scores (WHZs) of less than or equal to -3 or as less than or equal to 70% of the reference median using US National Center for Health Statistics (NCHS)/WHO reference values (severe wasting) or symmetrical edema involving at least the feet (edematous malnutrition, kwashiorkor).⁹ The present study was conducted to assess risk factors influencing the morbidity and mortality in children with severe acute malnutrition.

In present study, out of 150, males were 80 and female were 70. Modi et al¹⁰ assessed the predictors of morbidity in children with SAM. Of 3704 children screened for SAM, 504 (13.6%) fulfilled the case definition but the final analysis was done on 425 children. The most common co morbidity in these children was diarrhea (63.5%) followed by pneumonia (40%), tuberculosis (5.1%) and HIV in 1%. After multivariate regression analysis, the present study observed shock, hypoglycemia, severe anemia and bacteremia as independent risk factors significantly associated with morbidity & mortality.

We found that out of 150, age group 2-6 months had 60, 6-24 months had 55 and 24-60 months had 35 cases. Exclusive breastfeeding was seen in 45, 35 and 25, partial in 10, 12 and 8 and not breastfeeding in 5, 8 and 2, hospital stay >7 days seen in 45, 30 and 24 and

discharged 54, 51 and 32 in patients with age group 2-6 months, 6-24 months and 24-60 months respectively.

Sunguya et al¹¹ in their study a total of 1121 children with severe malnutrition were admitted. The proportion of male children with malnutrition was higher than that of female children. Non-oedematous malnutrition was more prevalent at MNH (N=504; 64%) than KDH (N=130; 38%). Conversely, oedematous was more prevalence than non-oedematous malnutrition among children admitted at KDH (N=210; 61.7%). More than 75% of all patients with severe PEM were children <2 years old. Thirty-six per cent of all severe PEM cases had malaria in both hospitals. Forty-five per cent of all admitted patients with severe PEM at KDH had diarrhoea. Two hundred twenty-two (28%) and 64 (19%) of the children with severe malnutrition died at MNH and KDH, respectively. Oedematous PEM was associated with a higher case fatality rate than non-oedematous one ($P<0.05$). At MNH, 86% of the patients who died with severe malnutrition had other co-morbidities. More (46%) oedematous malnourished patients with co-infections died at MNH than non-oedematous malnourished patients (19%). At KDH, septicaemia was the leading cause of death (55%) among severely malnourished patients.

Berkley et al¹² found that overall, 4.4% (359) of children included in the study died while in the hospital. Sixteen percent (1282/8190) of admitted children had severe wasting, kwashiorkor ($n=778$), or both. The areas under the receiver operating characteristic curves for predicting inpatient death did not significantly differ. Although sensitivity and specificity for subsequent inpatient death were 46% and 91%, respectively, for MUAC less than or equal to 11.5 cm, 42% and 92% for WHZ less than or equal to -3 , and 47% and 93% for visible severe wasting, the 3 indices identified different sets of children and were independently associated with mortality. Clinical features of malnutrition were significantly more common among children with MUAC less than or equal to 11.5 cm than among those with WHZ less than or equal to -3 .

Conclusion

Authors found that days of hospitalization and mode of feeding are factors affecting outcome of the treatment in patients with severe acute malnutrition.

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