Clinical Profile and Outcomes of Children Aged 6 to 59 Months Admitted to a Tertiary Care Hospital with Severe Acute Malnutrition

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ABSTRACT

Objective: The present study was conducted with the objective of determining the prevalence of SAM and the clinical profile associated with SAM like risk factors, co-morbid conditions, type of SAM and to find out the outcome of SAM after hospitalization and treatment.

Study Design: Hospital based prospective observational study

Place and Duration of Study: This study was conducted at the department of Pediatrics, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan from July 2019 to June 2020.

Materials and Methods: 50 SAM children of aged 6 months to 59 months were included into the study after meeting the inclusion criteria. Historical, clinical and laboratory data were recorded in a predesigned proforma. Data were analyzed using appropriate statistical method.

Results: The prevalence of severe acute malnutrition is 2.7%.The mean age of study population is 21.86 ± 14.85 months.68%were male and 32% were female out of the 50 SAM children. No edematous SAM were more (56%) than the edematous SAM (44%).Highest incidence of SAM were in the age group of 6 -24 months (68%).Almost all the cases (96%) belonged to low SES.78% mothers were either illiterate or primary school educated. EBF up to 6 months of age were only in 16% of cases. Major clinical presentation was diarrhea (70%), fever (68%), anorexia (66%), ARI (56%), vomiting (38%), eye problems (38%).Comorbid conditions associated with SAM were anemia (86%), pneumonia (42%), worm infestation (40%) followed by UTI (38%) & tuberculosis (16%). Recovery rate is 54%. Mean hospital stay is 10.28± 5.84 days. 2 children (4%) died during hospital stay.

Conclusion: Severe acute malnutrition is the most severe life threatening form of malnutrition which requires urgent attention. Timely identification and intervention of various risk factors, clinical and comorbid condition is likely to break the vicious cycle of under nutrition, infection and SAM and thereby improve outcome.

Key Words: Severe acute malnutrition, female literacy, socio-economic status, wasting

INTRODUCTION

Malnutrition in children is the most serious health problem affecting globally till twenty first century with much more prevalent in the developing countries including Pakistan. Many children die every day directly or indirectly from malnutrition. With proper attention and nutritional therapy most of these deaths can be prevented.[1]

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Severeacute malnutrition (SAM) is an unique type of severe malnutrition. It is the most severe and life threatening form of malnutrition in children and is responsible for high morbidity and mortality among malnourishedchildren.[2] Globally approximately 19 million children under five years of age suffered from SAM in 2015.[3] The World Health Organization (WHO) has recommended this special classification for identifying and managing children with life threatening malnutrition. Severe acute malnutrition is defined as presence of any of the following I) weight for height/length below-3 standard deviation (SD or Z score) of the median WHO growth reference ii) presence of bipedal nutritional edema or iii) mid upper arm circumference below 115 mm in the age group of 6 months to 59 months.[4] A vast majority (over90%) of children with SAM is located in south and southeast Asia and Sub Saharan Africa. India has the greatest population of severely malnourished children in the world and accounts for over 20% of under-five childhood death every year and around 2.1 million children in this country do not survive to celebrate their

first birthday.[5]According to National Family Health Survey 4 (NFHS-4, 2015 -2016) report, in Pakistan, 7.4% of malnourished children are severely wasted (weight for height < -3 SD)and in Sindh, 6.2% of under five children are severelywasted.[6] Since wasting denotes acute malnutrition, these children are said to have severe acute malnutrition. Better clinical characterization, triage and appropriate treatment of complications on admission along with nutritional therapy and targeted supportive treatment as outlined in the WHO protocol is associated with improved outcome.[7]Clinical profile of severe acute malnutrition is different from place to place or region to region. As the underlying clinical factors, co morbidities and health system infrastructure differ in places and countries, understanding of the child health profile in different places will help to enable proper targeting and prioritizing of intervention and resource allocation.[8]There is wide a variation of spectrum of nutritional disorders in this southern Assam, India, a geographically landlocked region with population of diverse ethnicity, multilingualism, religion and cultural practices with the rest of the country.

Inspite of significant economic improvement of Pakistan, prevalence of malnutrition specifically severe acute malnutrition is significantly high. According to NFHS-4(2015 -2016) report, 7.4% of malnourished children are severely wasted in is 6.2%.Clinical profile of acute severe malnutrition (SAM) is different from place to place. Understanding of child health profile in different geographical area will help to prioritize intervention and resource allocation.

MATERIALS AND METHODS

This hospital based prospective study was carried out in the department of Pediatrics, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan from July 2019 to June 2020. A total of 50 children of age 6 months to59 months admitted in the department for severe acute malnutrition related complaints were included for study. The geographical locations of the study population were Barak Valley, Assam and neighboring states. The children were enrolled for the study after satisfying the following inclusion and exclusion criteria. Inclusion Criteria: (i) Wt for ht/length< - 3 SD or Z score of median WHO growth reference. (ii) MUAC < 11.5 cm (iii) Nutritional edema of feet. Exclusion Criteria: (i) Children with non nutritional causes of SAM. (ii) Children with congenital anomalies, mental retardation, cerebral palsy, chronic renal diseases, congenital chronic hemolytic anemia. Informed consent of parents was taken before inclusion to the study. Details clinical and laboratory parameters were recorded in a pre designed proforma. Anthropometry was done with electronic weighing machine with sensitivity of ±10 gm, infant meter and stadiometer, narrow flexible no stretchable measuring tape. Z score was calculated using WHO MGRS standard deviation chart.9 Laboratory tests like blood sugar(R), hemoglobin level, serum electrolytes, TC, DLC, X-Ray chest, mantoux test, stool and urine for routine and culture were routinely done. Other specific tests were done whenever necessary. Therapeutic management of all the cases was done according to the protocol of WHO.[1,10]

Discharge criteria. SAM cases were discharged when they met the following criteria.

1. Satisfactory weight gain i.e. >15% of admission weight.
2. Edema resolved.
3. Return of good appetite.
4. Medical complications treated.

Statistical Analysis: Statistical analysis of data was done using Statistical Package for Social Sciences (SPSS 16.0 version).

RESULTS

Prevalence of SAM. The overall prevalence of severe acute malnutrition in our study population is2.7%.Socio demographic profile, baseline characteristics, Clinical profile and outcome are shown in Table 1, 2, 3.

Table No.1: Distribution of patients according to baseline characteristics (n = 50)

1. Gender	*n* (%)
Male	34(68)
Female	16(32)
2. Age in months (mean)	
6 -12(9.2)	18 (36)
13 -24 (16.3)	16 (32)
25 -36 (33.8)	8 (16)
37 -48 (45.7)	8 (16)
49 -59	
3. Religion	
Hindu	21(42)
Islam	28(56)
Christian	1 (2)
4.Socio economic	*n* (%)
Status	
Lower	10(20)
Upper lower	38(76)
Middle	2 (4)
Upper	0 (0)
5.Parental literacy	
Illiterate/upto Primary.	
Mother	39(78)
Father	20(40)
Upto high school	11(22)
Mother	30(60)
Father	

Table No.2: Distribution of patients according to Clinical profile (n = 50)

1.Risk factors *n*(%)	2.Type*n* (%)	3.Clinical Presentation *n*(%)	4.Co-morbity *n*(%)
Low SES 48(96) No EBF 42(84) Low maternal education 39(78) Delayed & thin complementary feed 35(70) Incomplete immunization 35(70)	Non edematous 31(62) Edematous 19(38)	Diarrhoea 35(70) Fever 34(68) Anorexia 33(66) ARI 28(56) Vomiting 19(38) Eye problem 19(38) Hypoglycemia 7(14)	Anemia 43(86) Pneumonia 21(42) Worm infestation 20(40) UTI 19(38) TB 8(16)

Table No.3: Outcome

Recovery (Wt gain >15% of admission wt) *n*(%)	Non respondent (Wt gain <10gm/kg/day *n*(%)	Average Wt gain gm/kg/day	Defaulters *n*(%)	Duration of hospital stay. *days* (mean)	Death *n*(%)
27(54)	15(30)	7.5	6(12)	10.28 ±5.84	2(4)

DISCUSSION

The prevalence of SAM in our study is 2.7% which is lower than the national prevalence (7.9%, NFHS-3). Similar prevalence was reported by A S Bhadoria11 from northern India and H D Shewade[12] from Puducherry as2.2% and 3.6% respectively. Prevalence of SAM varies widely across the Indian states.

We observed that male children with SAM were almost twice as that of female (68% vs 32%).Similar findings were observed by few workers.[13,14] However, studies by M B Sing[15] and S Rao[16]found higher prevalence of SAM among girls. Higher prevalence in males in our study may be due to more importance given to male child for medical care because of societal attitude.

Though our study population is from the Hindu majority area, more number of SAM (56%) is seen amongst Muslim children. We could not correlate any association of prevalence of SAM with religion. This may because of small sample size and needs further socio- demographic studies.

The mean age of the study population is 21.86 ±14.85 months. Two third (68%) of the total cases belong to the age group of 6 -24 months. Similar results also reported by Aguaya et al in studies in Jharkhand where77.7% of SAM patients were below 2 years of age.[17]

More number of cases in our study is seen between6-12 months. This may be due to late introduction of complementary feeds, inadequate (thin) food, less birth spacing.

Almost all the SAM cases in our study (96%) belong to lower socio-economic class (Kuppuswamy scale IV and V). No cases belong to upper S E class. This indicates the unavailability of food, poor purchasing power, lack of nutrition knowledge in a deprived community. Similar observation was made in other study also.[18]

78% of mothers and 40% fathers of SAM children were either illiterate or had only primary school education.

Only 28% mothers were high school educated. Parental education specially women literacy is the most important determinants of malnutrition. Educated mother will have a greater awareness of nutrition, balanced diet and health of their children. Several studies from Bangladesh and India[19,20] observed such correlation between low parental education and malnutrition in children.

84% of the SAM children did not receive exclusive breast feeding up to 6 months of age. Similarly 35(70%) children had delayed start of complementary feeding with thin or watery food. These two-non EBF and improper complementary feeding caused SAM in majority of cases below 2 years of age. Similar observations were made by K Mishra et al in their study.[21]Other risk factors observed like low maternal education, incomplete immunization were 78 and 70% respectively. Out of 50SAM cases, non edematous SAM was more (62%) than edematous SAM in our study.

Diarrhoea (70%) and fever (68%) were the most common clinical presentation followed by anorexia (66%), ARI (56%), vomiting (38%), eye problems(38%) and hypoglycemia 14% of SAM cases. Similar findings were reported by R Kumar et al[22] in their study.

Among the co-morbid conditions, 43 children(86%) had anemia of varying grades. Prevalence of otherco-morbid conditions were pneumonia (42%), worm infestations (40%), UTI (38%) & tuberculosis (16%). These findings are consistent with previous reports.[23] On analysis of outcome of SAM cases in this study, it is found that 54% recovered (wt gain >15% of admission wt) and 30% did not respond (wt gain < 10gm/kg/day) to treatment. Average weight gain and mean duration of hospital stay were 7.5 gm/kg/day and 10.28± 5.84 days. Six children (12%) defaulted & 2(4%) died during hospital stay. In a similar study by K Sing, N Badgaiyan and K P Kushwaha in Uttar Pradesh in2010, they reported average weight gain as 7.3 gm/kg/day, average hospital stay of 13.2 days, recovery rate of46.8% and discharge without recovery as 53.2% in theirstudy.[24]

CONCLUSION

Severe acute malnutrition is the most severe and life threatening form of malnutrition which require surgent attention. Timely identification and intervention of various risk factors, clinical and co-morbid conditions is likely to break the viscious cycle of under nutrition, infection and SAM and thereby improve outcome.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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