Original Article

The Profile of Severe Acute Malnutrition in Infants below 6 Months versus 6-60 Months of Age Children

Iftikhar Ahmad, Imran Qaisar and Abdul Rehman

ABSTRACT

Objective: To compare the clinical and laboratory findings, the comorbid conditions and the outcome in children aged < 6 months versus those aged 6 to 60 months with SAM.

Study Design: Cohort study

Place and Duration of Study: This study was conducted at the Pediatrics Unit 2, Bahawal Victoria Hospital, Bahawalpur from April 2018 to November 2018.

Materials and Methods: This cohort study was conducted on children, aged 1-60 months, having WHO criteria of SAM.

Results: Out of a total of 62 cases, 29.0% were less than 6 months of age whereas 71.0% were 6 to 60 months. There were a total of 56.5% male and 43.5% female. Only 14.5% children were exclusively breast fed. Out of 62 cases, 56 (90.3%) recovered well while 2 (3.2%) deaths were reported. The raised blood urea level and leukocytosis turned out to be statistically significant in children < 6 months of age while anemia (p = 0.017) was noted to be statistically significant in 6 to 60 months age group.

Conclusion: Lack of breastfeeding was found to be very high in children with SAM. The raised blood urea levels as well as the leukocytosis were found to be significantly more common in children with SAM who were aged less than 6 months while anemia was significantly more common in children aged 6 to 60 months.

Key Words: Sever acute malnutrition, anemia, leukocytosis, raised blood urea level.

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INTRODUCTION

Malnutrition is said to be underreported and not addressed properly in a developing country like Pakistan. Globally, one out of every four child is estimated to be stunted due to malnutrition in countries which are underdeveloped. In Africa, the situation is even more worse where two out of every five children experience malnutrition. In developing countries, malnutrition is estimated to contribute more than 50% to mortality in children who are under 5 years of age.[1,2]

Severe acute malnutrition (SAM) is defined as the presence of one or more than one of the following three signs in children 6-60 months of age:

1- Edema of both feet
2- Weight for height/length less than -3SD
3- Mid-upper arm circumference less than 115 mm

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For infants less than 6 months of age the presence of one or more than one of the above mentioned signs except third one is used to label SAM.[3]

In children who are reported with SAM along with diarrhea, studies report a high rate of mortality which is said to be in between 67 to 71%. Dehydration coupled with imbalance of electrolytes is the most frequent reason of deaths in such cases. Some studies have pointed out sepsis, pneumonia and malaria as the other major causes of mortality in SAM.[4-7]

Being a developing country, Pakistan has a high mortality rate under 5 years of age and there is very little local studies available about SAM especially in infants < 6 months of age. The objective of the study was to compare the clinical and laboratory findings, the comorbid conditions and the outcome in children aged < 6 months versus to those aged 6 to 60 months with SAM.

MATERIALS AND METHODS

This cohort study was conducted from April 2018 to November 2018, on children, aged 1-60 months, having WHO criteria of SAM admitting in Pediatrics unit 2, Bahawal Victoria Hospital, Bahawalpur. This study was approved by local ethical committee. The verbal consent was taken from the parents/guardians of the enrolled cases. Children whose parents/guardians refused to give consent or left the ward before

completion of investigations were excluded from the study. The relevant history was taken from the parents/guardians and clinical examination was done by one of the authors. The relevant investigations were done in the Pathology/Radiology department of the Bahawal Victoria Hospital/ Quaid e Azam Medical College Bahawalpur. The children were managed according to WHO guidelines.[3]

The level of Hemoglobin (Hb) < 11 gm/dl was considered as anemia in children in all age groups.[8,9] Leukocyte Count (TLC) < 4000 cells/cu mm was considered to be leukopenia and > 16000 cells/cu mm as leukocytosis. The random Blood Sugar (RBS) < 54 mg% was considered as hypoglycemia according to WHO SAM guidelines. The blood urea > 40 mg/dl was taken as high while serum creatinine > 0.90 mg/dl was taken as high (deranged). Hyponatremia was labeled when serum sodium was <135mEq/l whereas hypokalemia was declared with serum potassium < 3.5 mEq/l. Urinary tract infection was diagnosed by doing complete urine report as well as culture.

The clinical profile and laboratory findings, the comorbid conditions at the time of admission as well as outcome during hospital stay of SAM infants < 6 months were compared with those of children aged 6 to 60 months with SAM.

SPSS version 20 was used for data entry and statistical analysis. The continuous variables were presented with confidence interval (95% CI). Chi Square test was applied to compare qualitative data and p value of less than or equal to 0.05 was considered as statistically significant.

RESULTS

Out of a total of 62 cases, 18 (29.0%) were less than 6 months of age whereas 44 (71.0%) were 6 to 60 months. There were a total of 35 (56.5%) male and 27 (43.5%) female. Only 9 (14.5%) children were exclusively breast fed. Diarrhea was found in 38 (61.3%), pneumonia 35 (56.5%) and urinary tract infection 9 (14.5%). Anemia was noted to be present in 47 (75.8%), hyponatremia 38 (61.3%), deranged creatinine 7(11.3%), leukocytosis 20 (32.3%) and raised blood urea in 19 (30.6%) cases.

Out of 62 cases, 56 (90.3%) recovered well and got discharged while 4 cases left against medical advice. Two deaths (3.2%) were reported (one in 6-60 months and other in infants less than 6 months of age groups). Mean weight gain of the cases was 10.7 grams per kg per day with a standard deviation of 6.2 whereas mean duration of hospital stay was noted as 8.3 days ranging from 3 to 42 days.

When both groups were compared as shown in Table No.1, raised blood urea (p = 0.001) and leukocytosis (p = 0.012) turned out to be statistically significant in children < 6 months of age while anemia (p = 0.017) was noted to be statistically significant in 6 to 60 months age group. All other variables were noted to be insignificant between the two study groups.

Table No.1: Comparison of Clinical Profile and Laboratory Findings of SAM in between both study groups

Characte-ristics	Age group <6 months (n=18)	Age group 6-60 months (n=44)	Total cases (n=62)	P Value
Male	10 (55.6%)	25 (56.8%)	35 (56.4%)	0.927
Exclusively breast fed	3 (16.7%)	6 (13.6%)	9 (14.5%)	0.758
Pneumonia	7 (38.9%)	28 (63.6%)	35 (56.4%)	0.074
Diarrhea	11 (61.1%)	27 (61.4%)	38 (61.3%)	0.985
Urinary tract infection	4 (22.2%)	5 (11.4%)	9 (14.5%)	0.271
Malaria	1(5.5%)	4 (9.1%)	5 (8.1%)	0.6426
Tuberculosis	0 (0%)	1(2.3%)	1(1.5%)	0.519
Anemia	10 (55.6%)	37 (84.1%)	47(75.8%)	0.017
Leukopenia	3 (16.7%)	10 (22.7%)	13 (21%)	0.595
Leukocytosis	10 (55.6%)	10 (22.7%)	20 (32.3%)	0.012
Raised blood urea	11 (61.7%)	8 (18.2%)	19 (30.6%)	0.001
Deranged Creatinine	2 (11.2%)	5 (11.4%)	7 (11.3%)	0.977
Hypoglycemia	4 (22.2%)	11 (25.0%)	15 (24.2%)	0.817
Hyponatremia	11 (61.1%)	27 (61.4%)	38 (61.3%)	0.985
Hypokalemia	7 (38.9%)	15 (34.1%)	22 (35.5%)	0.720
Mortality during hospital stay	1 (5.6%)	1 (2.3%)	2 (3.2%)	0.507
Left against medical advice	1 (5.6%)	3 (6.8%)	4 (6.4%)	0.854
Recovered well and got discharged	16 (88.9%)	40 (90.9%)	56 (90.3%)	0.807

DISCUSSION

SAM is a serious public health issue globally. Researchers around the world have been more focused related to SAM's management in the children who are from 6 to 60 months of age but recently more evidence is forming an opinion that SAM also affects infants who are less than 6 months of age. In the present study, we found that there were 29% infants with SAM aged less than 6 months. Ali SM et al in 2017 found 24% infants with SAM in the age group of < 6 months in the 2 year study.[10] In another recent study,[11] the prevalence of this age group was found to be 10% that is lesser than the present work. Main factor contributing to SAM

in children less than 6 months could be low number of infants being exclusively breast fed. We also found only 14.5% children on exclusive breastfeeding in the current study. Ali SM et al also had found only 7% children having exclusive breastfeeding from India.[10]

Comorbid conditions affiliating SAM are known to be the main challenge confronting management. Comorbid conditions also contribute significantly in treatment failure and prolonge duration of hospital stays.[1,10,11] Major focus on comorbid conditions while managing SAM improves treatment outcome as has been suggested previously.[12,13]

We found diarrhea in 38 (61.3%), pneumonia 35 (56.4%) and urinary tract infection 9 (14.5%). Diarrhea, pneumonia and UTI, all have been found to be predominantly present in children with SAM who are aged 1 to 60 months[10] previously as well but nor many publications have documented much about these comorbidities. We found leukocytosis as well a raised level of blood urea significantly more common in infants who were aged less than 6 months. A similar finding has been observed previously[10] but not much material was found for comparison of these conditions in the past literature. These relations may be described on the fact that SAM in infants < 6 months of age have more probability of infections along with dehydration. This arises the point that young infants with SAM should be given extra attention for detection and management of any subclinical infection in this particular age group.

We found anemia as significant underlying morbidity in children who were aged 6 to 60 months. Anemia has been known to be the most common comorbidity accompanying children with SAM in a recent study while the same study stated that those children who are presented without anemia are more likely (more than 3 times) to have positive outcomes when coming with SAM.[1] Children in the studied age group have good outcome if treated properly during their stays.[14-17] We found 90.3% children in the present study who recovered well.

We found a mean weight gain of 10.7 grams per kg per day that is highly acceptable in terms of international standards (more than 8 grams per kg bodyweight per day).[18,19]

Infants who are aged less than 6 months with SAM have been found neglected for much data as not many studies are witnessed in this age group.[20] Management of infants who are aged less than 6 months with SAM vary in comparison to those who are aged 6 to 60 months so we need to effectively apply WHO protocol while managing such cases to reduce the burden of SAM in our population.

CONCLUSION

Lack of breastfeeding was found to be very high in children with SAM. a raised level of blood urea as well as leukocytosis were found to be significantly more common in children with SAM who were aged less than 6 months while Anemia was significantly more common in children aged 6 to 60 months.

Author's Contribution:

Concept & Design of Study:	Iftikhar Ahmad
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Revisiting Critically:	Iftikhar Ahmad, Imran Qaisar
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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