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Clinical Profile and Outcome of Severe Acute Malnutrition Patients Admitted in a Secondary Level Hospital of Bangladesh

Ashutosh Singha[1*], Sharadindu Kanti Sinha[2], Md. Anamul Haque Khan[3], Purabi Mazumder[4]

[1]MD, Pediatrics, Senior Consultant, Pediatrics, 250 Bed District Sadar Hospital, Sunamganj, Bangladesh
[2]MBBS, M. Phil in Pharmacology, Assistant Professor, Department of Pharmacology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
[3]DCH, Pediatrics, Junior Consultant, Pediatrics, 250 bed District Sadar Hospital, Sunamganj, Bangladesh
[4]MD, Pediatrics, Resident Physician, Pediatrics Outdoor, 250 District Sadar Hospital, Sunamganj, Bangladesh

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***Corresponding author:** Ashutosh Singha
MD, Pediatrics, Senior Consultant, Pediatrics, 250 Bed District Sadar Hospital, Sunamganj, Bangladesh

Abstract **Original Research Article**

Background: Severe Acute Malnutrition (SAM) possess a significant global health challenge, particularly in low- and middle-income countries, contributing to high rates of morbidity and mortality among children under five years old. ***Objective:*** This study aimed to assess the Clinical Profile and Outcome of Severe Acute Malnutrition Patients attending a Secondary Level District Hospital in Bangladesh. ***Method:*** Conducted from July 2022 to Jun 2023, this prospective cross-sectional study included 62 children aged 1 to 59 months admitted with SAM. Written permission was obtained from guardians, and data were collected using a structured questionnaire. Demographic characteristics, anthropometric measurements, laboratory findings, and treatment outcomes were analyzed. ***Results:*** The study revealed that infants aged 12 to 24 months comprised the majority (43.5%) of the sample, with the significant proportion falling within the 1 to 5-months range (29%). Males slightly outnumbered females, constituting 56.45% of the population, while 77.42% of participants hailed from rural areas. Common health issues included cough (38.7%), anorexia (20.96%), acute watery diarrhoea (11.29%), and edema (17.74%). Anemia was the predominant complication affecting 58.06% of individuals, followed by pneumonia (54.55%) and urinary tract infections (9.67%), septicemia (5%). The majority (54.55%) of individuals had a hospital stay exceeding 15 days, and only a minority (41.93%) adhered to follow-up appointments post-hospitalization. Regarding weight gain outcomes, 45.16% exhibited good weight gain, 37.09% medium, and 17.74% poor. ***Conclusion:*** The study highlights significant health challenges among infants aged 1 to 6 months, with predominant cases in the 12 to 24 months range. Common issues include fever, acute respiratory infections, with pneumonia being the major complication. Severe Acute Malnutrition (SAM) often coexists with pneumonia, emphasizing the need for comprehensive management. Despite notable health concerns, a substantial portion of patients experience poor follow-up adherence and varying weight gain outcomes. These findings stress the urgency of tailored interventions to address the multifaceted health needs of the population, particularly in rural areas, for better outcomes and improved healthcare delivery.

Keywords: Severe Acute Malnutrition (SAM), Clinical Profile, Pneumonia.

INTRODUCTION

Severe Acute Malnutrition (SAM) represents a significant global health challenge, particularly in low- and middle-income countries, where it contributes to high rates of morbidity and mortality among children under five years. Understanding the clinical profile and outcomes of SAM patients is essential for developing effective management strategies and improving health outcomes in these vulnerable populations [1-3].

SAM is a complex and life-threatening condition characterized by severe deficits in nutritional status, often accompanied by medical complications such as infections and metabolic disturbances. Children affected by SAM face an increased risk of mortality and long-term health consequences, making it a critical priority for public health interventions worldwide. Despite efforts to address malnutrition through various interventions, SAM continues to pose a significant burden on healthcare systems in resource-limited settings, necessitating further research to improve clinical management and outcomes [5-8].

The clinical presentation of SAM can vary widely depending on factors such as age, underlying medical conditions, and the presence of comorbidities. Common features of SAM include severe wasting, stunting, edema, and compromised immune function, all of which contribute to increased susceptibility to infections and other complications. Understanding the clinical profile of SAM patients is crucial for early identification, accurate diagnosis, and timely intervention to prevent adverse outcomes.

While numerous studies have investigated the clinical characteristics and outcomes of SAM in various settings, there remains a need for context-specific research to inform tailored interventions and improve patient care [9-12]. This study aimed to address this gap by examining the clinical profile and outcomes of SAM patients in secondary level district hospital. By analyzing factors such as demographic characteristics, anthropometric measurements, laboratory findings, and treatment outcomes, this study was undertaken to gain insights into the epidemiology and management of SAM in our setting. Through a comprehensive analysis of SAM patients' clinical profiles and outcomes this study also seek to inform evidence-based strategies for improving the care and management of malnourished children in our healthcare system.

METHODS

This prospective cross-sectional study was conducted at 250-Beded District Hospital, Sunamganj from July 2022 to Jun 2023. Total one hundred and two (102) patients were admitted in the hospital during that period, among them ten patients referred to higher canter due to various complications, seven patient was defaulter of treatment. Sixty-two children admitted with SAM aged 1 month to 59 months were included in this study who fulfil the inclusion criteria. Inclusion criteria were age 1 month to 59 months with any one of the following: Weight for height Z score less than - 3SD, gross visible wasting, bipedal edema. Exclusion criteria included secondary cause of SAM, congenital anomaly responsible for difficulty in feeding. Written permission was taken from guardians of the patient for the study. A structured questionnaire was used to collect the data. Outcome variables were rate of weight gain, rate of cure, percentage of death, average duration of hospital stay, percentage of SAM patients. Discharge criteria were- weight for height Z score equal/more than -2SD or weight gaining at a rate of 5gm or more per day, completion of treatment for all medical conditions, EPI vaccinations updated or rescheduled. The data were populated in an Xcel spreadsheet and analyzed.

Procedure entailed all patients attending at pediatrics outdoor being screened with mid upper arm circumference (MUAC) tape. Patients with MUAC less than 115mm who fulfilled SAM admission criteria were admitted to SAM block of pediatrics ward. After admission proper history was taken and physical examination was done, anthropometric measurements were done, and Z scores were calculated. Detailed history was taken with preformed questionnaire. Blood glucose was measured with a glucometer immediately after admission and treatment was initiated accordingly. Complete blood Count, urine and stool for routine and microscopic examination, CXR, MT were done. Treatment was started with standard treatment protocol according to WHO and national guideline. Feeding was started through nasogastric tube with F-75 for stabilization phase. Ampicillin and gentamicin injection were started to treat hidden or overt infection. If the condition deteriorated or not improved after 3 days of antibiotics administration, antibiotic therapy switched over to inj. ceftriaxone. The weight of the baby was measured daily with electronic weighing scale with precision rate up to 5 grams. Follow-up was done daily to determine any adverse effect or complications. Counseling was done to the attendants of the patient about the nature of the disease. They were also taught the methods of making nutritious food for their baby at home. When edema disappeared and most of the allocated food can be completed by patient, diet changed to F 100. This transition of diet continued for 2 days. On the third day of transition, free feeding started, and the patient were offered to eat as much food as the patient can eat. The patient was discharged when weight for height Z score reached more than -2 SD or gaining weight at a rate of 5gm/day or more. During discharge, patient's guardians were advised to attend follow-up visit after one week and one month. Data were recorded in preformed questionnaire form by the investigator. Data analysis and processing were done with the help of computer program SPSS and Microsoft excel.

RESULTS

Among the admitted patients, 29% children were in the age group of below 6 months, 43.5% were in the age group of 6 to 12 months and 27.5% children were in the age of 13 months to 59 months. In terms of gender, males slightly outnumber females, constituting 56.45% and 43.55% of the population respectively. Regarding residential status, the majority of participants hailed from rural areas, representing 77.42% of the cohort, while urban residents make up the remaining 22.58%.

Table-I: Demographic Status of the study group

Age group	N	%
1 Months -5Months	18	29%
6 Months- 12 Months	27	43.5%

13 Months-59 Months	17	27.5%
Gender	N	%
Male	35	56.45%
Female	27	43.55%
Residential status	N	%
Rural	48	77.42%
Urban	14	22.58%

Table-II: Educational status of mother

Level of educational	N	%
Illiterate	28	45.13
Up to primary level	21	33.87
Post primary	13	21.0

40.3% mother of admitted patient complete primary education, 38.48% mother complete various level in secondary school, 21% mother were illiterate and 0.02% mother complete secondary level.

Table-III: Profession of father

Profession	N	%
Day laborer	24	38.73
Farmer (small scale)	18	29.03
Garments worker	3	4.83
Other job	17	27.41

Table-IV: Presenting symptoms

Symptoms	**%**
Cough	38.7%
Fever	13.8%
AWD	11.29%
Anorexia	20.96%
Not thriving well	14.5%
Edema	17.74%
Skin lesion	3%

Chief presenting symptoms of admitted children were cough (38.7%), fever (13.8%), AWD (11.29%), edema (17.74%), not thriving well (14.5%) anorexia (20.96%), skin lesion (3%).

Table-V: Immunization status

Level of immunization	**N**	**%**
Completed as per age	20	32%
Partially completed	34	55%
Not started immunization	8	12.9%

Among admitted children only 32% were completed immunization as per age, 12.9% children not started immunization, 55% children were partially immunized or not up to date as per age.

Table-VI: Age of starting complementary feeding

Age	**N**	**%**
1 month	11	17.74%
2-3 months	8	12.91%
4-5 months	18	29.04%
6 months	15	24.19%
After 6 months	10	16.12%

Complementary feeding was started at one month of age in 17.74% children, at two to three months of age in 15.84% children, at four to five months of age in 19.83% children, at six months in 12.85% children and in 33.74% children started after 6 months.

Table-VII: Complication of the study group

Complications	**N**	**%**
Pneumonia	**18**	**54.55%**
Anemia	**36**	**58.06%**
UTI	**6**	**9.67%**
Tuberculosis	**3**	**4.83%**
Developmental delay	**1**	**3.22%**
Septicemia	**5**	**8.06%**

Among the study group pneumonia emerged as the predominant complication affecting 54.55% of individuals, anemia was also notable affecting 58.06% children, urinary tract infection (UTI) was identified in 9.67% of cases, tuberculosis was diagnosed in three children (4.83%), developmental delay was noticed in 3.22% children, septicemia was detected in 12.58% children, acute gastroenteritis was developed in 18.18% children. Average duration of hospital stay was 14 days. Percentage of SAM patient was.

Table-VIII: Nature of weight gain

Weight gaining rate	**N**	**%**
Good ≥10gm/day	28	45.16%
Moderate 5-10gm/day	23	37.09%
Poor < 5gm/day	11	17.74%

Regarding weight gain outcomes 45.16% children exhibited good weight gain, indicating positive response to treatment and nutritional support. However, a larger proportion (37.09%) experienced medium weight gain, suggesting some progress but potentially indicating room for improvement in nutritional management. Additionally, 17.74% showed poor weight gain, highlighting the persistence of other factors hindering recovery despite medical intervention.

Table IX: Follow-up at 7 and 30 days

Follow-up	**N**	**%**
1st follow-up (after 7 day)	26	41.93
2nd follow-up (after 30 days)	24	38.7

In terms of follow-up status within 7 days post-hospitalization 41.93% of individuals adhered to follow-up appointments, while the majority (58.07%) did not. This discrepancy may pose challenges in monitoring recovery progress and ensuring continuity of care. However, poor weight- gained group showed substantial improvement in weight on 1st and 2nd follow-up visit which indicate success of counselling. Total 102 patient admitted during that period, out of which 10 patients were referred to higher center for various complications,

7 patients were defaulter of treatment and discharged before fulfilling discharging criteria, 7 patients died. Cause of death are septicemia in 5 cases, diarrhea in 2 cases.

DISCUSSION

This study revealed that 29% of patients were less than 6 months old which underscores the early commencement of complementary feeding with poor breast-feeding practices. Majid at al. in their study found 19.3% children are in the age range of 1-6 months which is slightly lower than current study Male children (56.45%) were slightly outnumbered female (43.55). Additionally, most children were from rural (77.42%) background and lower socio-economic class [11].

Educational status of mother revealed that 45.13% mother10 were illiterate, 33.87% mother did not cross primary level. Islam *at al.* also found association between SAM and maternal education. Fever is a common complaint in both cohorts, indicating a high likelihood of underlying infections or inflammatory responses. Malnutrition appears to be a significant concern in both studies, evidenced by high rates of stunted growth and anorexia [12, 10-11]. However, the specific complications differ, with one study emphasizing respiratory issues such as pneumonia and acute respiratory infections, while the other underscores the prevalence of anemia and urinary tract infections [8-9]. These differences may reflect varying environmental factors, healthcare access, or population characteristics.

Clinical diagnoses further elucidate the health profiles of the study population which was relevant to our study. This suggests multifaceted health challenges requiring comprehensive management strategies.

Hospitalization patterns and treatment outcomes shed light on the severity of illness and response to medical intervention. Prolonged hospital stays are common in two cohorts, [5-6] indicating the complexity of cases and the need for extensive medical management. However, adherence to follow-up appointments varies significantly between the two studies, posing challenges in post-hospitalization monitoring and continuity of care. Despite differences in follow-up rates, one report varying degrees of weight gain outcomes post-treatment, indicating the effectiveness of interventions but also the persistence of nutritional challenges in some individuals [8].

CONCLUSION

In conclusion, the demographic profile of the studied population indicates a predominant representation of infants aged 1 to 6 months, with a slightly higher proportion of males and a majority residing in rural areas. Health assessments reveal issues such as fever, anorexia, and acute respiratory infections, reflecting significant health challenges within the community. Pneumonia emerges as a prominent complication, often accompanied by severe acute malnutrition, underlining the critical need for comprehensive healthcare interventions. Despite prolonged hospitalizations and varied treatment outcomes, the adherence to post-hospitalization follow-up appointments is notably low, posing challenges in ensuring continued care and monitoring of recovery progress. These findings underscore the complex interplay of nutritional, respiratory, and socioeconomic factors impacting the health outcomes of the studied population, emphasizing the necessity for tailored and sustained healthcare interventions to address their multifaceted needs effectively.

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