



A STUDY OF CLINICAL PROFILE AND COMPLICATIONS OF SEVERE ACUTE MALNUTRITION IN 6 MONTHS TO 5 YEARS OLD CHILDREN ADMITTED IN A TERTIARY CARE HOSPITAL

Paediatrics

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ABSTRACT

Background: Malnutrition in children is a major problem in developing nations like India. Undernutrition among children < 5 years is a significant contributor to the global disease burden and is a major cause of child mortality worldwide. Despite of significant economic improvement of India, prevalence of malnutrition specifically severe acute malnutrition (SAM) is significantly high. **Objectives:** To study the clinical profile, risk factors and complications of severe acute malnutrition in children aged between 6 months to 5 years old admitted in a tertiary care hospital. **Methods:** A hospital based cross sectional observational study of 100 patients admitted in the Pediatric ward at Gauhati Medical College and Hospital, Guwahati, Assam from 1st June 2021 to 31st May 2022 within the age group of 6 months to 5 years with features of SAM. **Results:** In the present study, most of the cases were of 6 months to 2 years (62%) with male predominance (56%). 92% patients were from rural area, 71% belongs to lower socio-economic status, 68% family were of large size, 40% cases were given prelacteal feed and 74% were deprived of exclusive breast feeding for 6 months. In this study, presenting symptoms were fever (72%), cough and running nose (52%), loose stool (40%), vomiting (42%), anorexia (34%). In the present study, common co morbidities were nutritional anaemia (82%), diarrhoea (40%), pneumonia (36%), vit D deficiency (32%), UTI (28%), Sepsis (18%), hypokalaemia (15%), hypoglycaemia (14%) and vit A deficiency (xerophthalmia) (8%). **Conclusion:** From the present study, It was observed that large family size, maternal illiteracy, inadequate immunization, lack of exclusive breast feeding etc are important risk factors for SAM. If necessary, measures are taken against these risk factors we can prevent SAM among children.

KEYWORDS

SAM, Xerophthalmia, Sepsis, Hypoglycaemia

INTRODUCTION:

Malnutrition in children is a major problem in developing nations like India. Children's age less than 5 years is the critical period for rapid physical growth as well as overall child development. Children suffer from various forms of undernutrition if the nutritional requirement is compromised. Undernutrition among children < 5 years is a significant contributor to the global disease burden and is a major cause of child mortality worldwide. Despite of significant economic improvement of India, prevalence of malnutrition specifically severe acute malnutrition is significantly high. According to recent NFHS-V (2019-2021) report, prevalence of severe acute malnutrition in India is 7.7% among under 5-year-old children. ⁽¹⁾ The average case death rate is around 23.5 percent in SAM, which in oedematous youngsters may reach up to 50%. SAM kills by increasing the case fatality among children with common diseases such as pneumonia and diarrhoea. ⁽²⁾ Each year, 60 percent of the 10.9 million deaths of under five children are caused directly or indirectly by malnutrition. Well over two-thirds of these fatalities are frequently linked to improper feeding habits during first year of life. ⁽³⁾ Acute malnutrition is an unstable disease that develops after a brief period of nutritional deficiency and is frequently made worse by an ongoing infection. Malnutrition risk factors include parental illiteracy, insufficient eating practices, poverty, and large family size. ⁽³⁾ Exclusive breast feeding till the age of 6 months, complimentary feeding start at 6 months of age along with breast feeding continue till 2 years of age are of prime importance for the prevention of malnutrition. ⁽⁶⁾ WHO Criteria for detecting SAM in children older than 6 months are any children with a weight-to-height < -3SD and / or visible severe wasting and / or mid upper arm circumference (MUAC) < 11.5 cm and / or oedema of both feet (other causes of oedema should be ruled out). ⁽¹⁴⁾

Many researchers carried out studies over severe acute malnutrition to know the clinical profile and complications of severe acute malnutrition in different parts of the country. But no such studies were done in this hospital. Under this backdrop, the present study was undertaken to study the clinical profile, risk factors and complications of severe acute malnutrition in children aged between 6 months to 5 years old admitted in a tertiary care hospital.

MATERIAL AND METHODS:

This study was conducted in the department of paediatrics, Gauhati Medical College and Hospital, Assam over a period of one year from 1st June 2021 to 31st May 2022. A total of 100 cases presenting with features of severe acute malnutrition ranging from 6 months to 5 years of age were taken by simple random method and were included in the study after getting informed consent from the parents in local language

(Assamese). Ethical clearance was taken from Institutional Ethics committee of Gauhati Medical College and Hospital, Assam. Cases were selected based on following WHO criteria: weight for height below -3 standard deviation of median WHO growth reference, mid upper arm circumference below 11.5 cm, presence of bipedal oedema, visible severe wasting. Children who do not fulfil this inclusion criteria were excluded from the study. The disease process and the importance of the study were explained in detail to the parents. We explained any questions or doubts to the parents in local language. It was also explained that at any time they can discontinue the study if they want. A detailed history like demographic profile, associated risk factors and presenting complaints, clinical examinations findings including anthropometry were recorded in the pretested proforma for all the cases. The temperature was recorded with the help of digital thermometer placed in the axilla. Weight of the child was measured in Kg by electronic weighing machine, length was measured in cm using infantometer for children below 2 years of age and height was measured in cm with stadiometer for above 2 years of age. Head circumference and mid upper arm circumference were measured in cm with non-stretchable measuring tape. Interpretation was done using WHO Growth Chart. Thorough physical examination of each case was done to assess the child and to detect presence of any complications. After admission, laboratory investigations: RBS, CBC, PBS study for RBC morphology, RE urine, urine CS, RE stool were done. Other additional investigations like chest X-ray, Mantoux test, serum electrolytes, renal function test, blood CS, CSF analysis, vitamin D level etc were done as per the need of the patients. These investigations were done at Pathology, Biochemistry, and Microbiology laboratory in Gauhati Medical College and Hospital.

RESULTS:

Table 1: Shows Socio Demographic Profile Of The SAM Cases (n= 100)

	Parameters	Number of patients	Percentage
Age:	6 months to 2 years	62	62 %
	2 to 3 years	19	19%
	3 to 4 years	14	14%
	4 to 5 years	5	5%
Sex	Male	56	56%
	Female	44	44%
Settings	Rural	92	92%
	Urban	8	8%
Economic status	Upper middle	1	1%
	Lower middle	4	4%
	Upper lower	24	24%

	Lower	71	71%
Educational status of mother	Illiterate	62	62%
	Up to class X	32	32%
	Beyond class X	6	6%
Large family size (>2 child)	Yes	68	68%
	No	32	32%

In regard to gender distribution, 56% patients were males and 44% patients were female and male to female ratio of 1.27:1. Majority of the SAM cases were of 6 months to 2 years (62%) followed by 2 to 3 years group (19%). This study showed that 71% belongs to lower socio-economic status, 62 % mothers were illiterate. (Table 1)

Table 2: Shows Risk Factors Of SAM Cases (n=100)

Parameters	Number of cases	Percentage
Prelactal feed	40	40%
Bottle feed	70	70%
Deprived of exclusive breast feeding	74	74%
Inadequate complimentary feeding	82	82%
Partial immunization	59	59%

The present study showed that 40% cases were given prelactal feed, 74 % were deprived of exclusive breast feeding for 6 months, 70% cases were given bottle feeding and 59% patients were partially immunized. (Table: 2)

Table 3: Shows Presenting features of SAM cases (n=100%)

Parameters	Number of cases	Percentage
Fever	72	72%
Cough and running nose	52	52%
Vomiting	42	42%
Loose stool	40	40%
Anorexia	34	34%

Table 3 shows that presenting symptoms, fever (72%), cough and running nose (52%) and vomiting (42%) were the most common presentation in this study. This was followed by loose stool (40%) and anorexia (34%).

Table 4: Shows Comorbidities Among SAM Cases (n=100)

Comorbidities	Number of cases	Percentage
Nutritional anaemia	82	82%
Diarrhoea	40	40%
Pneumonia	36	36%
UTI	28	28%
Vit D deficiency	28	28%
Sepsis	18	18%
Hypokalaemia	15	15%
Hypothermia	11	11%
Vit A deficiency	8	8%

In the present study, common co morbidities were found nutritional anaemia (82%), diarrhoea (40%), pneumonia (36%), Urinary tract infection (28%), sepsis (18%), hypothermia (11%) and vitamin A deficiency (8%) (Table 4).

DISCUSSION:

In the present study, It was found that maximum number of cases (62%) with severe acute malnutrition were in the age group of 6 months to 24 months. Similar results were observed by many researchers in their studies like Pathak Nripendra Nath et al (2019)⁽⁴⁾ found 68%, Bijoy Kumar Panigrahi et al (2018)⁽⁵⁾ found 63.4%. This may be due to lack of exclusive breast feeding for 6 months, complementary feeding not started at 6 months of age, type and frequency of complementary food given to the child was inadequate. Overall, there was male (56%) preponderance among the cases in our study. This is concordant with the findings in other studies Chaurasiya et al⁽⁶⁾ (2018) male cases were 52%, Anshuman et al(2018)⁽⁶⁾ male cases were 54.86%. The reason could be a greater number of male children were brought to the health care facility than the female children. In this study, 92% children with SAM were from rural area. Other workers like Kedarnath Das et al (2018)⁽¹⁰⁾ and Suman Das et al (2017)⁽¹¹⁾ found 85.3% and 75% of cases were from rural area. In this study, the maximum number of children affected were from rural area probably due to outreach of health facility and lack of awareness about nutritious food among rural population. Further, illiteracy of parents

also a contributing factor. In the present study, majority of SAM children (71%) were belonged to lower and 24% belong to upper lower socio-economic class according to the modified Kuppuswamy classification. This is similar with the results in the study of Anshuman et al⁽¹⁰⁾ 78%. In this study, majority of mothers of SAM cases were illiterate 62% and beyond class X standard 6%. Parental education especially maternal literacy is one of the important determinants of malnutrition. Educated mother will have a greater awareness of nutrition, balanced diet and health status of their children. Several studies done in our country shows such correlation between low maternal education and malnutrition in children. Pathak Nripendra Nath et al (2018)⁽⁴⁾ and Ansuya et al (2018)⁽¹²⁾ found 78% and 76% parents were either illiterate or up to primary school standard respectively. Further, we observed majority of the family of SAM cases (68%) were belong to large family size. This result is comparable with the study of Bahawaluddin Jamro et al⁽¹³⁾ in their study found that 66.7% cases had large family size. In the present study, 74% cases were having history of lack of exclusive breast feeding for 6 months. Kedarnath Das et al (2021)⁽¹⁰⁾ and Pathak Nripendra Nath et al (2018)⁽⁴⁾ found 79.1% and 84% cases were not given exclusive breast feeding for 6 months. The present study showed that 40% of SAM cases were having history of pre lacteal feed. Ansuya et al⁽¹²⁾ (2018) and Madhusudhan et al⁽¹⁵⁾ (2017) found 40% and 34% cases were given prelactal feed. This study showed that 70% SAM children were having history of bottle feed. Kedarnath Das et al⁽¹⁰⁾ and Ansuya et al⁽¹²⁾ in their study found 77% and 72% SAM cases were having history of bottle feed which are concordant with our study. It was observed in this study that majority of mother stopped exclusive breast feeding and started bottle feeding which causes repeated infection and ultimately leads to malnutrition. In the present study, majority of cases were presented with fever (72%), cough and running nose (52%) and vomiting (42%). This result is concordant with Nripendra Nath et al⁽⁴⁾ found fever (68%), cough and running nose (56%), loss of appetite (34%) and vomiting (42%). It was observed in this study that large number of (40%) children suffered from repeated attack of diarrhoea probably due to not continuing exclusive breast feeding for 6 months, early initiation of complementary food before 6 months of age, use of bottle feeding and unhygienic feeding practices. This finding is concordance with the result of Rajkumari et al⁽¹⁶⁾ (2021) 45.2%. The present study showed that 36% SAM children were suffered from pneumonia. This is similar with the results of Anshuman et al⁽⁵⁾ (2018) 34% and Arun Kumar Arya et al⁽¹⁷⁾ (2017) found 26.5%. In the present study it was observed that 18% SAM children had sepsis. This is concordance with the result of the study done by Kedar Nath Das et al⁽¹⁰⁾ 26.7%. Large number of SAM children in the present study suffered from sepsis due to faulty feeding practices, diminished immunity and incomplete vaccination. Majority of the cases of our study(82%) had nutritional anaemia. It is similar with the result of the studies done by Susheel Kumar Saini et al⁽¹⁸⁾ (2022) 86% and Rajkumari et al⁽¹⁶⁾ (2020) found 70%. In our study, vit A deficiency was detected in 8% of SAM children. It is comparable with the study done by Susheel Kumar Saini et al⁽¹⁸⁾ (6%).

CONCLUSION:

From the present study, It was observed that large family size, lower socio economic status, maternal illiteracy, inadequate immunization, prelactal feed, lack of exclusive breast feeding, early or late initiation of complementary feeding, providing inadequate complementary feed, bottle feeding are important risk factors for severe acute malnutrition. To prevent development of SAM, following steps may be taken: strict 2 child policy should be practiced. Literacy rate of parents to be increased, specially maternal literacy. Awareness about the importance of colostrum and exclusive breast feeding for 6 months should be increased among mothers and other family members. Mothers should be educated in regard to complementary feeding. Awareness about the importance of consuming green leafy vegetables and locally available seasonal fruits in the community level to be increased.

Limitations:

One of the limitations of our study was an observational study. Moreover, it was a small study and sample size was small. Furthermore, the study was conducted in a short period. Further research in this topic is needed with greater sample size and longer study period to make any strong recommendation.

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Conflicts Of Interest: None

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