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Clinico-Etiological Profile and Outcome of Severe Acute Malnutrition & Measures to Prevent

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ABSTRACT

Background: Malnutrition is India's silent crisis. Child under nutrition remains one of the major health issues and the leading contributor to under 5 morbidity and mortality in the world. The present study was undertaken to assess the Clinico-etiological profile and the outcome of patients with SAM. **Methods**: In this retrospective study, a total of 46 children aged between 6 to 60 months admitted to paediatric ward with a diagnosis of SAM (as per WHO definition) were included. Variables recorded were anthropometry, clinical presentation, laboratory tests, epidemiological factor, and risk factors. **Results**: Mean age of admitted children was 18.26±5.44 months with female predominance(60.9%) and mostly partially immunised (84.8%) and belonged to lower socio-economic scale (45.7%).Majority of patients with SAM didn't follow exclusive breast feeding and complimentary feeding practices. Early introduction of over diluted cow milk seen in most of the patients. Acute respiratory infection was the most common comorbidity found in 27(58.6%) children. Out of 46 children, 34 recovered (73.9%), 11 (23.9%) were defaulter and 1 child was died during the study period. In maximum cases duration of hospital stay was 7 to 15 days (28; 60.8%). **Conclusion**: Most of the studies highlight clinical manifestations of SAM. Risk factors isolated were not following Breast feeding practices, inappropriate complimentary feeding, incomplete immunisation, and anaemia. Ideal method to prevent patients to land up into SAM will be tackle risk factors. This can be done methodically by increasing maternal awareness. This should be mandatorily practiced by paediatrician at the time of discharge and regular immunisation visits.

Key Words: *Severe acute malnutrition; Clinico-etiological; Anaemia; National Family Health Survey*

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INTRODUCTION

Malnutrition is India's Silent crisis. It is a general term and often refers to undernutrition resulting from inadequate consumption, poor absorption, or excessive loss of nutrients, but the term also encompasses over nutrition [1]. Malnutrition in children is widely prevalent in developing countries including India (15.8%). It is one of the leading causes of morbidity and mortality in children throughout the world [2].

Severe acute malnutrition (SAM) is a unique type of malnutrition and is different from severe underweight and severe stunting. It is a medicosocial disorder. Lack of exclusive breastfeeding, late introduction of complementary feeds, feeding diluted feeds containing less amount of nutrients, repeated enteric and respiratory tract infections, ignorance, and poverty are some of the factors responsible for SAM [3]. Worldwide, the prevalence of SAM is 1–2% in developing and in least developed countries [4]. Mortality in SAM children is 9 times higher than nourished children and continues to be an important major mortality factor [5].However, in India, SAM continues to be a significant public health issue. As per National Family Health Survey-4 (NFHS-4), nearly 8.1 million children aged <5 years (6.4%) suffer from SAM [6]. SAM increases mortality, morbidity, impairs physical and mental capabilities of child so require urgent attention with nutritional rehabilitation.

Although the prevalence of SAM varies across states like Madhya Pradesh recording the highest rate (55%) and Kerala among the lowest (27%) [7]. This is believed to be due to a combination of socio-economic and societal factors including poverty, food insecurity, gender inequality, disease and poor access to health and developmental services [7,8]. Recovery rates in inpatient facilities to treat SAM children (NRCs) varied from state-to-state ranging from 37.1% to 65% [9].In Maharashtra, over 6 lakh children are malnourished and of this number, 4.5 lakh fall under the SAM category. The WHO criteria to identify SAM in infants more than 6 months and within 60 months of age are, weight for height less than -3SD and/or visible severe wasting and/or, mid upper Arm circumference (MUAC) < 11.5 cm and/or edema of both

feet. The present study was undertaken to assess the clinico-etiological profile and the outcome of patients with SAM and measures to prevent it.

Materials and Methods

This was a retrospective data of SAM children admitted to tertiary care centre. Institutional ethical clearance was obtained before undertaking this study. Data of the children fulfilling the WHO criteria for SAM, between the age group of 6 months to 60 months, were included in the study. Children with surgical causes for SAM were excluded like short bowelsyndrome. The WHO criteria to identify SAM in infants more than 6 months and within 59 months of age are, weight-forheight less than -3SD and /or, visible severe wasting and/or, Mid Upper Arm Circumference (MUAC)<11.5 cm and/or edema of both feet. The criteria to identify SAM in infants less than 6 months of age are, edema of both feet and/or weight for length less than -3SD (in infants with length more than 45 cm) and /Or visible severe wasting in infants with less than 45 cms[10].

The data were collected for the analysis like age, sex, criteria for admission, associated medical complications, type of feeding, immunisation status, anthropometry, clinical presentation, laboratory tests, epidemiological factor, and risk factors, duration of stay in the hospital, discharges, discharges against medical advice, readmissions, referrals, and death.

Statistical Analysis

The data were collected and entered in Microsoft Excel sheet and then statistically analysed using SPSS Version 20.0. Continuous variables were expressed as mean ± SD and categorical variables were summarized as frequencies and percentages.

Results

In this retrospective study, a total of 46 children aged between 6 to 60 months admitted to paediatric ward with a diagnosis of SAM (as per WHO definition) were included. Maximum i.e., 50% of cases were from the age group of 1 to 2 years with female predominance (60.9%).The majority of cases parents belonged to lower or lower middle socio-economic class and most of the cases partially immunised (84.8%) as shown in table 1.

Table 1: Socio-demographic profile of children, Immunisation status and maternal age

Socio- demographic data		Frequency	Percentage
Age group	6 to 12 months	12	26.1
	1 to 2 years	23	50.0
	3 to 5 years	11	23.9
Gender	Male	18	39.1
	Female	28	60.9
Socio-economic status	Lower	21	45.7
	Lower middle	13	28.3
	Lower upper	08	17.4
	Upper	04	8.7
Immunisation status	Completed	06	13.0
	Partially immunised	39	84.8
	Non-immunised	01	2.2
Maternal age (years)	<20	07	15.2
	21 to 30 years	29	63.0
	>30 years	10	21.7

Maximum children (58.7%) were exclusively breast fed more than 6 months while in 41.3% of children exclusive breast feeding was practiced less than 6 months, (Table 2).

Table 2: Duration of exclusive breastfeeding

Exclusive breastfeeding	No. of patients	Percentage
Less than 6 months	19	41.3
More than 6 months	27	58.7
Total	46	100

In majority of children complementary feeding was started at age less than 6 months (54.3%) followed by 6 to 12 months (32.6%) and bottle feeding was the commonest method of feeding (45.7%). Diluted cow milk was the most common complementary feeding given as shown in table 3.

Table 3: Age of starting complementary feeding, method of feeding and complementary feeding given.

Complementary feeding		No. of patients	Percentage
Age of starting complementary feeding	Less than 6 months	25	54.3
	6 to 12 months	15	32.6
	More than 12 months	06	13.0
Method of feeding	Katori spoon	13	28.3
	Bottle feeding	21	45.7
	Both	12	26.1
Complementary feeding given	Diluted cow milk	36	78.3
	Mashed Biscuits	10	21.7

Out of 46 children, 29 (63%) had weight more than 2.5 kgs as depicted in figure 1.

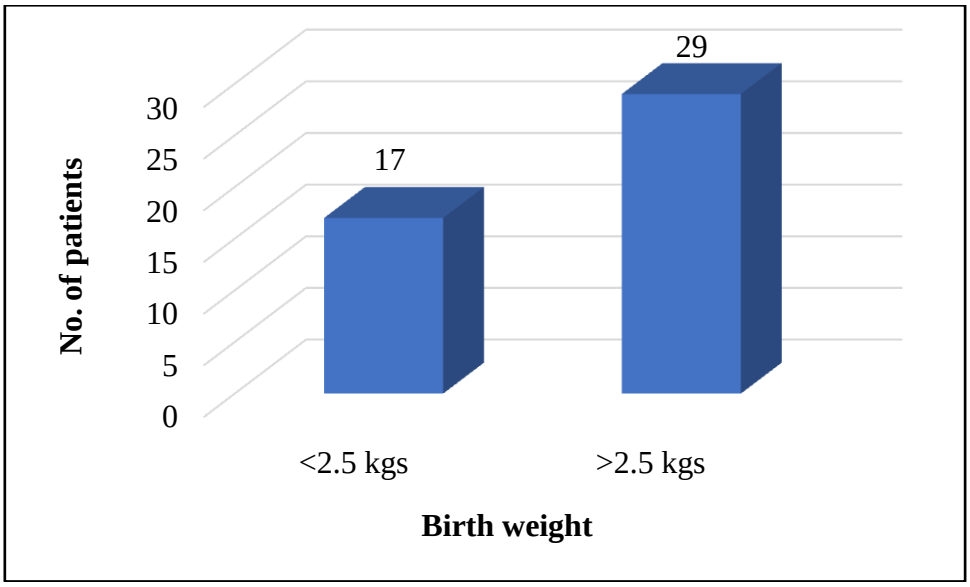

Figure 1: Birth weight

Acute respiratory infection was the most common comorbidity found in 27 children (58.6%). Out of 46 children, 34 recovered (73.9%), 11 (23.9%) were defaulter and 1 child was died during the study period. In maximum cases duration of hospital stay was 7 to 15 days (28; 60.8%) as depicted in figure 2.

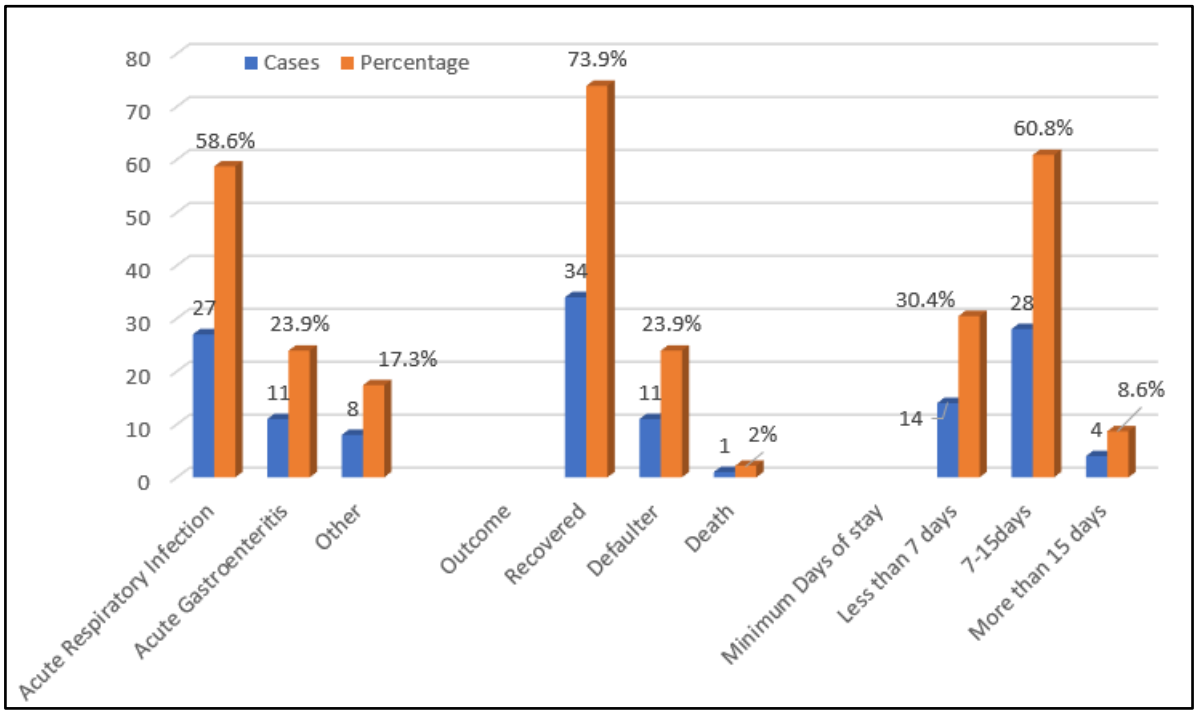

Figure 2: Comorbidities and outcomes

DISCUSSION

Nutrition is vital for individual growth and the focal point of health and well-being. Preschool children are mainly a nutritionally vulnerable segment of the population. Nutrition during the first five years has an impact not only on growth and development in the growing age group, but also acts as a determinant of nutritional status in adolescent and adult life. SAM is a preventable and treatable cause of childhood mortality and morbidity [11]. In the present study, a maximum number of children (approximately 76.1%) were less than two years which is comparable with the previous studies [12, 13]. In the first two years of life, rapid growth and development occur and demands of substrates for energy and building of tissues also rise, thus leading to deficiency of energy, protein and micronutrients often leading to malnutrition. Also, growth and nutritional requirement are maximum during the younger age group. In the current study, females were more than males (60.9% versus 39.1%) with a ratio of 1.55:1. A higher number of female patients was also found by Sharma et al [14], and Shah et al [15]. All these studies were community-based studies. They postulated that due to ritual and social norms, parents give more importance and seek medical advice more often for the male child. Socio-economic position of the family is a strong determinant of health and nutrition. We found in majority of cases parents belonged to lower or lower middle socio-economic class which is correlated with the other studies [7, 11, 13]. This indicates that poor purchasing power, unavailability of food, improper distributions make the children vulnerable to malnutrition in a deprived community. Out of 46 cases, 6 (13%) were completely immunized whereas 39 (84.85) were partially immunized and only 1 (2.2%) was unimmunized which is comparable with the study done by Najar BA et al [11] and Choudhary et al [13].

In the current study, maximum children (58.7%) were exclusively breast fed more than 6 months while in 41.3% of children exclusive breast feeding was practiced less than 6 months. In majority of children complementary feeding was started at age less than 6 months (54.3%) followed by 6 to 12 months (32.6%) and bottle feeding was the commonest method of feeding (45.7%). Diluted cow milk was the most common complementary feeding given. These findings are in accordance with the study done by Najar BA et al [11], Patil BM et al [16], and Gamit VD et al [17] A high incidence of bottle feeding have been reported by Patil BM et al [(45.5%) [16] and Choudhary et al (17.3%) [13] comparable to our study. As per WHO and UNICEF recommendations, the infant should be exclusively breastfed for 1st six months of life to achieve optimal growth and development. Thereafter to meet their evolving nutritional requirement, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continued up to 2 years of age [18, 19].

Out of 46 children, 29 (63%) had weight more than 2.5 kgs and 17 had weight less than 2.5 kgs which is correlated with the Gamit VD et al study [17]. Acute respiratory tract infections and Acute Gastroenteritis were the common associated complications in SAM children as similar to the study done by Chakraborty et al [13], Ahmad K et al [20] and Panigrahi BK et al [21].

In the present study, out of 46 children, 34 were recovered (73.9%), 11 (23.9%) defaulter and 1 child was died during the study period. In maximum cases duration of hospital stay was 7 to 15 days (28; 60.8%). These findings are in accordance with the study conducted by Ahmad K et al [20] and Panigrahi BK et al [21].

Limitation of our study was inadequate follow up. Hence, Hospital based management of these children in specialised feeding centre is very important for faster recovery and a better weight gain. Thus, improvement in nutritional status is necessary in the severely malnourished to have a better outcome [22].

CONCLUSION

Most of the studies highlight clinical manifestations of severe acute malnutrition. The problem of SAM is multidimensional and multifactorial. Risk factors isolated were not following Breast feeding practices, inappropriate complimentary feeding, incomplete immunisation, and anaemia. Ideal method to prevent patients to land up into SAM will be tackle risk factors. This can be done methodically by increasing maternal awareness. This should be mandatorily practiced by paediatrician at the time of discharge and regular immunisation visits.

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