

CLINICAL PROFILE AND OUTCOME OF CHILDREN WITH SEVERE ACUTE MALNUTRITION ADMITTED AT NUTRITIONAL REHABILITATION CENTER OF MCCH-ASSOCIATED HOSPITAL OF GMC-ANANTNAG

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ABSTRACT

Objectives: The objectives of this study were to study the clinical profile and outcome of children Admitted in NRC of MCCH-associated hospital of GMC-Anantnag.

Methods: Children in the age group of 1 month-5 years, admitted to NRC of our hospital between April 2019 and May 2022 with severe acute malnutrition (SAM) were enrolled for the study. As per a predesigned pro forma, a detailed history was taken from mothers or caregivers and nutritional status assessment using standard anthropometric methods was performed. Classification of malnutrition was made according to the WHO guidelines. Anthropometric measurements including weight in kg and length/height in cm, weight for height, Z score, mid-upper arm circumference, and presence of edema were used to classify the grades of malnutrition. After basic workup and starting nutrition rehabilitation, serial weight gain was recorded. Outcome of patients (home discharge, referral to higher center, and death) was recorded and analyzed.

Results: A total of 306 children with SAM admitted to NRC of our hospital were enrolled for the study. Majority were of 7–12 months of age (n=93; 30.4%), of female gender (n=178; 58.2%), were from nuclear families and from families with spacing between two children <2 years. SAM was more among children of illiterate and unskilled parents and of parents in the lower and upper lower socioeconomic status (288, 94%). Acute gastroenteritis (n=206; 67.32%) and acute respiratory tract infection (n=158; 51.6%) were most predominant comorbidities seen among hospitalized children. Hypoglycemia (n=183; 59.80%) and hypokalemia (n=56; 18.30%) were most common metabolic derangements. Among the admitted children 119 (38.88%) had good weight gain (10 mg/kg/day), 136 (44.44%) had moderate weight gain (5-10gm/kg/day) and 51 (16.66%) had poor weight gain (<5 g/kg/day). Out of 306 children admitted, 276 (91%) children were discharged after successful rehabilitation and 27 (9%) were transferred to higher center. No death was documented among SAM children during the study period.

Conclusion: Malnutrition in under five children is high and multi-factorial. Hospital-based management of SAM is an important step in reducing the morbidity and mortality among such children.

Keywords: Malnutrition, Nutritional rehabilitation, Severe acute malnutrition, Nutritional rehabilitation Center.

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INTRODUCTION

Malnutrition contributes to millions of under five deaths worldwide each year. Apart from decreasing child mortality, nutrition is one of the most important factors that affect child's overall health. The National Family Health Survey-3 (2005-06) estimates that 8 million under-five children in India are suffering from severe acute malnutrition (SAM) [1]. Of 38% of children under the age of 5 were stunted for their age; 21% were thin for their height; 36% were underweight; and 2% were overweight (NFHS-4, 2015–16) [2]. In NFHS-5, 19–20, it was observed that after nutritional and other interventions, stunting decreased from 38% to 36%, wasting from 21% to 19%, and underweight from 36% to 32% [3]. Although the child nutrition has improved in all phase-II States/UTs, it still continues to be a major health problem for individuals in pediatric age group.

Nutritional rehabilitation center (NRC) is a unit in the health facility where SAM children are admitted as per the defined admission criteria. It provides medical and therapeutic nutritional care as well as capacity building of mothers and other caregivers regarding appropriate feeding and caring practices for infants and young children as per SAM management guidelines by the WHO and Indian Academy of Pediatrics. During the stay in NRC, along with medical and nutritional

therapeutic care, mothers/caregivers are also provided counseling and support to address the reasons for poor nutrition and health in their child. Global guidance for SAM children with complications is to provide the in-patient child with F75 (75 kcal or 315 kJ/100 ml) or F100 (100 kcal or 420 kJ/100 ml) or ready-to-use therapeutic food as per their requirements. After discharge, the child is followed up in to avoid relapse.

To the best of our knowledge, no such study is available in south Kashmir, J and K. This study was designed to look for clinical profile of SAM patients admitted to NRC of our hospital for better understanding of the problem and outcome after rehabilitation of such patients.

Aim of the study

The aim of this study was to study the clinical and outcome of children admitted in NRC of MCCH-associated hospital of GMC-Anantnag.

METHODS

Type of the study

A hospital-based observational study of children with SAM admitted to the NRC were enrolled in the study.

Table 1: Age and gender distribution of admitted SAM children

Variable	Year: 2019, number of SAM child (n=106)	Year: 2020, number of SAM child (n=86)	Year: 2021, number of SAM child (n=111)	Total/% age
Age (months)/gender				
1-6	24	15	20	59 (19.3)
7-12	30	27	34	93 (30.4)
13-24	28	17	22	67 (21.9)
25-36	15	20	18	53 (17.3)
37-<60	09	08	17	34 (11.1)
Gender				
Male	48	35	45	128 (41.8)
Female	58	53	67	178 (58.2)

Table 2: Sociodemographic characteristics and feeding pattern

Characteristics	Number	Percentage	Characteristics	Number	Percentage
Family type			Immunization status		
Joint	120	39.21	Unimmunized	18	3.92
Nuclear	186	60.75	Partially immunized	62	20.26
Socio economic status			Completely immunized	226	73.85
Upper Class	0		Feeding pattern		
Upper middle class	0		Adequate feeding	126	41.17
Lower middle class	18	5.88	Faulty feeding	180	58.8
Upper lower class	136	44.44	Late complementary feeding	128	41.83
Lower class	152	49.67	Spacing between 02 children <24 months	114	37.25
Educational status of parents			Feeding pattern		
Literate	91	29.73	Adequate feeding	126	41.17
Illiterate	215	70.26	Faulty feeding	180	58.8
Occupation of father			Late complementary feeding	128	41.83
Professional/Semi Professional	12	3.92	Spacing between 02 children <24 months	114	37.25
Skilled/Unskilled	294	96.07			
Area type					
Urban	94	30.71			
Rural	212	69.28			

Place of the study

The study was conducted at the MCCH-associated to GMC Anantnag.

Period of study

This study was April 2019–2022.

Study participants

Admitted children with SAM in the age group of 1 month-5 years were enrolled for the study. The Institutional Ethical Approval was obtained, and informed consent was taken from the parents or caregivers. A pre-designed pro forma was used for data collection. A detailed history was taken from mothers or caregivers. Nutritional status assessment using standard anthropometric methods was performed. Classification of malnutrition was made according to the WHO guidelines. Anthropometric measurements including weight in kg and length/height in cm, weight for height, Z score, mid-upper arm circumference (MUAC), and edema were used to classify the grades of malnutrition. Clinical profile, rate of weight gain, and outcome of patients were recorded and analyzed as appropriate.

RESULTS

A total of 306 SAM cases were studied during the study period. Age and gender distribution of admitted SAM children is depicted in Table 1. Sociodemographic and feeding pattern of study population is depicted in Table 2. Distribution of weight/height (Z scores) and MUAC on admission is shown in Table 3. Clinical profile of SAM patients is depicted in Table 4. Weight gain characteristics of study population and outcome are depicted in Tables 5 and 6, respectively.

DISCUSSION

This study was conducted between April 2019 and May 2022. Majority of the study population was female (58.2%) in the age group of

Table 3: Distribution of weight/height (Z score) and MUAC on admission

Z Score	Number/% age	MUAC at admission	Number/% age
<-2SD	44 (14.38)	<11.5 cm	156 (50.98)
<-3SD	210 (68.63)	11.5–12.5 cm	117 (38.22)
<-4SD	52 (16.99)	>12.5 cm	30 (9.80)

Table 4: Clinical profile of SAM patients

	Number	Percentage
Acute gastroenteritis	206	67.32
Acute respiratory infection	158	51.6
Urinary tract infection	15	4.90
Sepsis	48	15.65
Acute otitis media	28	9.1
Tuberculosis	5	1.633
Skin infection	10	3.26
Anemia	170	55.55
Vitamin deficiencies	56	18.30
Metabolic derangements		
Hypoglycemia	183	59.80
Hypokalemia	56	18.30
Hyperkalemia	2	0.65
Hypnatremia	18	5.88
Hypnatremia	5	1.633
Hypomagnesaemia	6	1.96

7–12 months (20.4%), followed by 13–24 months (21.9%), from lower socioeconomic class (94%), and from rural background (69.28%) (Tables 1 and 2). In majority, parents were illiterates (70.25%), unskilled labors (96%), and members of nuclear families (60.75%). Most of the

Table 5: Weight gain characteristics of the study population

Weight gain (g/kg/day)	(2018–2019)	(2019–2020)	(2020–2021)	Total/%age
Good (≥ 10)	38	36	45	119 (38.88)
Moderate (5– <10)	48	35	53	136 (44.44)
Poor (<5)	23	15	13	51 (16.66)

Table 6: Outcome of SAM children admitted in the NRC, n (%)

Parameters	2018–2019	2019–2020	2020–2021	Total (%)
Total admissions	106	89	111	306 (100)
Transferred	09	07	12	28 (9)
Death	0	0	0	0 (0)
Discharged	97	82	99	278 (91)

patients were immunized completely (74%) or partially (20%) and majority was having a history of faulty feeding (59%) (Table 2). At admission, MUAC was <11.5 in 51% patients and Z score for weight for height was $<3SD$ in 68% of patients and $<4SD$ in 17% of patients (Table 4). After nutritional rehabilitation, good to moderate weight gain was observed in 39% and 44% of study population respectively (Table 5). Most of the patients (91%) were discharged successfully and no deaths were reported (Table 6). Only 9% of patients were referred to a higher center for further management (Table 6).

Females constituted the majority of study population as observed by other researchers [4,5]. This reflects differential care for baby of different gender in our study. Maximum number of children was in the age group of 6–12 month followed by those in the age group of 12–24 months. This has been observed in many other studies [5,6] and may be attributed to improper introduction of complementary feeds.

The prevalence of SAM was seen more in nuclear families like many other studies [5,7]. This may be related possibly to economic stability and babies getting extra care in joint family structure in our society. Different studies reported higher incidence of SAM in the lower socioeconomic status [5,7]. In our study, SAM was more in lower and upper lower class (Kupuswamy socioeconomic status scale). This may be related to food insecurity and less availability of food to poor families. As reported in many other studies [7-9], SAM was significantly high in illiterate and unskilled parents than literate and professionals for the possible reason of job insecurity and economic instability.

In our study, SAM was more in children with faulty feeding due to over diluted formula feed or cow's milk and late starting of complementary feeding. Poor nutrition, poor nutrient content of diet, and inappropriate nutrition are all the known contributors of PEM.

The most common presenting disease in our study was gastroenteritis (n=206, 67.32%), followed by acute respiratory tract infection (n=158, 51.63%), sepsis (n=48, 15.68%), and acute otitis media (n=28, 9.15%), UTI (n=15, 4.90%). Many other researchers have reported similar findings [10,11]. SAM patients are known to have high incidence of gastroenteritis for poor hygiene and poor immunity. The present study shows significant rise of number of anemia (n=170, 55.55%) and vitamin deficiency among SAM patients (n=56, 18.30%). Decreased carbohydrate intake is known to result in micronutrient deficiency. In this study, most common electrolyte derangements were hypoglycemia (n=183, 59.80%) and hypokalemia (n=56, 18.30%). These derangements are known to occur in malnourished children [5].

A total of 306 patients with SAM were admitted, most of them (91%) were successfully discharged. This has been reported by other researchers too [5,12]. After nutrition rehabilitation was introduced, most of the patients responded well and gained weight appropriately (83%). These findings support timely introduction of nutritional

rehabilitation for the patients to decrease the morbidity and mortality as a result of SAM.

Strengths of our study

To the best of our knowledge, it is the first study related to clinical profile and outcome of SAM in pediatric age group conducted in our region.

Limitations

The major limitation of this study is that it does not include the follow-up data of the patients after successful rehabilitation.

CONCLUSION

Malnutrition in under five children is high and multi-factorial. Hospital-based management of SAM is an important step in reducing the morbidity and mortality among such children.

AUTHORS' CONTRIBUTIONS

Andleeb Majid and Showkat Hussain Tali for conceiving the idea of study. All the authors contributed in data collection, analysis, critical appraisal, and final approval.

CONFLICTS OF INTEREST

None.

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