DETERMINANTS OF SEVERE ACUTE MALNUTRITION IN HOSPITALISED SEVERE ACUTE MALNUTRITION PATIENTS AT TERTIARY CARE CENTRE IN HIMACHAL PRADESH

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ABSTRACT: Malnutrition, defined as underweight, is a serious public-health problem that has been linked to a substantial increase in the risk of mortality and morbidity. Many factors can cause malnutrition, most of which relate to poor diet or severe and repeated infections, particularly in underprivileged populations. Inadequate diet and disease, in turn, are closely linked to the general standard of living, the environmental conditions, and whether a population is able to meet its basic needs such as food, housing and healthcare. Malnutrition is thus a health outcome as well as a risk factor for disease and exacerbated malnutrition and it can increase the risk both of morbidity and mortality, thus we intend to study the different variables responsible for the development of severe acute malnutrition.

Key words: severe acute malnutrition, socioeconomic status, complementary feeding

INTRODUCTION

Childhood malnutrition is responsible for 22% of India's disease burden. According to the National Family Health Survey- 3, under-five mortality is 74 per 1,000 live births and one of the millennium development goals is to reduce it to 38 per 1,000 live births.[1].Severe acute malnutrition affects nearly 20 million preschool-age children mostly from the African Region and South-East Asia Region. It has been found that severe wasting, stunting and intrauterine growth retardation together are responsible for 0.6 million deaths in children under 5 yr. of age in India.[2] The prevalence of malnutrition varies across states with Madhya Pradesh recording the highest rates (55%) and Kerala among the lowest (27%). Children with severe acute malnutrition undergo physiologic and metabolic changes to conserve energy and preserve essential processes; including a decrease in the functional capacity of organs and slowing of cellular activities. Co-existing infections add to the difficulty of maintaining metabolic control. These children have a limited ability to respond to 3 stresses (infective and environmental) and are highly vulnerable. They are at risk of death from hypoglycemia, hypothermia, electrolyte imbalance, heart failure and untreated infection[3-5]. Based on scientific literature investigating the relationships among specific individual, household, and environmental factors and the

development of acute malnutrition in children, the following are significant risk factors for SAM: Inadequate dietary intake, Inappropriate feeding, Fetal growth restriction, Inadequate sanitation ,Lack of parental education ,Family size ,Incomplete vaccination, Poverty ,Economic, political, and environmental instability and emergency situations. Therefore our study aimed at educational status of the parent's socioeconomic status, low birth weight, exclusive breast feeding, and complementary feeding and its adequacy and age at which it was started to practice.

MATERIAL AND METHODS:

The Study was conducted at Dr RPGMC Tanda district Kangra Himachal Pradesh. This was a hospital based analytical survey.

INCLUSION CRITERIA

All consecutive children between the age of 6 and 60 months hospitalized with severe acute malnutrition in the Department of Pediatrics and fulfilling any one of the following criteria as per WHO guidelines with regard to growth parameters were included in study.

1. Weight for height less than -3SD.

2. Visible severe wasting.

3. Edema of both feet (excluding other causes of edema),

4. Mid-upper arm circumference less than 11.5 cm (in infant more than 6 months of age)

EXCLUSION CRITERIA

1. Children aged under 6 month or more than 60 months were excluded from study.

2. Other causes of edema (ex. nephrotic syndrome), associated systemic diseases (congenital heart disease, malabsorption, cerebral palsy, secondary malnutrition

According to the diagnostic criteria proposed by the World Health Organization (WHO), severe acute malnutrition (SAM) was diagnosed in children aged 6–60 months if any one of the following 1.) Weight for height below −3 standard deviation (Z score) of the median WHO growth reference 2006. 2.) Bipedal edema 3.) Mid-upper arm circumference (MUAC) below 11.5 cm in addition children with visible severe wasting were also be included for the study. The important data on demographic characteristics, vaccination status, knowledge and practice on nutrition from the immediate caregivers, which were usually be mothers, was collected on pre-structured proforma. Immunization status of the children was assessed looking at the vaccination card or asking the mother (caregiver). Completed immunization status according to the national program within 1 month after the recommended time qualified as "adequate immunization". Immunization that was either incomplete or delayed by more than a month according to the national program was classified as "not adequately immunized." Socioeconomic status was assessed using modified Kuppuswamy scale. Calorie and protein requirements were decided according to ICMR Guidelines. Adequacy of breastfeeding and complementary feeding were judged according to IMNCI Guidelines. Required investigations were performed as mentioned in proforma and data was compiled. Standard treatment was given to all the patients and discharge criteria was according to WHO Guidelines.

STATISTICAL ANALYSIS

The data were presented as frequency or percentages or mean±SD.

RESULTS

The present study was aimed to review the determinants of severe acute malnutrition among children aged 6–59 months in admitted patients of severe acute malnutrition. The study was conducted for the period of one year in the Department of Pediatrics, Dr RPGMC Kangra at Tanda. A total of 57 patients were included in the study after they fulfilled the inclusion criteria. In the present study, we found that the patients' age ranged from 6 months to 60 months with a mean age of 21.51 months. Majority of the patients were up to 12 months of age (50.87%) followed by 13-24 months (24.56%), and 37-48 months (10.52%). There was a near equal proportion of male and females in the study with male to female ratio of 0.96:1. A detailed analysis has been shown in Table 1.Out of 57 patients, only 7 patients had previous history of hospitalization. Fifty patients were fully immunized as per immunization schedule. 43 children had received exclusive breastfeeding, 9 children received cow's milk and 5 received buffalo milk. In 14 top fed, 10 bottle fed while 4 received spoon feeds (Table

2). We found that mean age at the start of complementary feeding was 7.93 months. The complementary feeding was found to be adequate in 10.53% patients (Table 3). In the present study, we found that in 61% cases the father had completed his secondary education, while in 7% cases, the father was graduate /postgraduate. In 8.7% cases, the father was illiterate. Among mothers, majority of them were secondary level educated (33%) while only 5% were graduate. Only 2% of them were illiterate. 53% patients were in class IV while 37% were in class III according to Modified Kuppuswamy scale (Table 4).

Table 1. Age and Sex Distribution of study group.

		n(%)
Age (Months)	mean±SD	21.51±16.17
Age-group (months)	≤12	29 (50.87%)
	13-24	14 (24.56%)
	25-36	4 (7.01%)
	37-48	6 (10.52%)
	>48	4 (7.01%)
Sex	Male	28 (49.12%)
	Female	29 (50.88%)
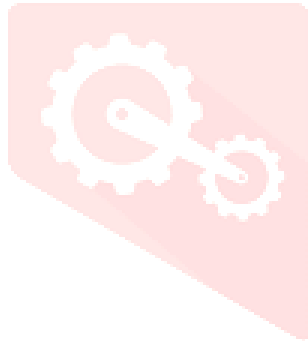
Table 2. Status of Previous Hospitalisation, Immunisation and Breastfeeding

Previous Hospitalisation	Yes	7 (12.28%)
	No	50 (87.72%)
Complete Immunization	Yes	50 (87.72%)
	No	7 (12.28%)
Exclusive Breastfeeding	Yes	43 (75.44%)
	No	14 (24.56%)
Type of feed* (n=14)	Buffalo Milk	5 (35.72%)
	Cow Milk	9 (64.28%)
Method of Feeding (n=14)	Bottle	10 (71.42%)
	Spoon	4 (28.58%)

Table 3. Status of Complementary feeding.

Age at the start of complementary feeding (month)	7.93±1.13
Adequate	6 (10.53%)
Inadequate	51 (89.47%)

Table 4. Parental Education status and Family Socioeconomic Class.

Paternal Education	Illiterate	3 (5.26%)
	Primary	1 (1.75%)
	Middle	12 (21.05%)
	Secondary	35 (61.40%)
	Intermediate	2 (3.51%)
	Graduate/Postgraduate	4 (7.02%)
Maternal Education	Illiterate	1 (1.75%)
	Primary	4 (7.02%)
	Middle	12 (21.05%)
	Secondary	19 (33.33%)
	Intermediate	12 (21.05%)
	Graduate/Postgraduate	3 (5.26%)
Socioeconomic Class	I	-
	II	3 (5.26%)
	III	21 (36.84%)
	IV	30 (52.63%)
	V	3 (5.26%)

Table 6. Shows distribution of birth weight in the study group.

Birth Weight (Kg)	≥2.5	41 (71.92%)
	<2.5	16 (28.18%)

Discussion

.In the present study, 57 patients with SAM who were admitted for treatment and eligible for enrollment were studied. In our study male to female ratio was 0.96. Males were 49.12% and females were 50.88% and the mean age of patients were 21.51±16.17 months. In our study group maximum number of children were within 6-12 months of age accounting for 50.87% of total while 24.56 % children were within 12-24months. So, 75.43%patients were less than 24 months of age. Similarly, in the studies by Choudhary M et al.[6]&Mamidi RS et al.[7], majority of patients 96% and 71% respectively were below 24 months. In our study, maternal and paternal illiteracy rates were 2% and 5.3% respectively. Mothers were educated up to secondary school in 33.3%and in 21% up to middle school and 21% up to intermediate school. Only 5.3% were educated up to graduation and beyond. Fathers were illiterate in 5.3%, studied up to primary in 1.8%, 21% up to middle and in 61.4% they were educated up to secondary school Only7% fathers were educated up to graduation or more In Study done by Das S et al.[8], maternal and paternal illiteracy rates were 23.01% and 19%. Fifty-eight percent of mothers studied up to primary school and middle school, 34.6% studied up to high school and intermediate and only 0.79% studied up to graduation and beyond, the percentages for fathers being 50%, 30%, 1.11% respectively. In the present study, 94.6% families belonged to lower socioeconomic strata i.e. class III, IV, V. 52.6% families belonged to class IV,36.8% to class III and 5.2% to class V. In a study by Das S et al.[7] 98.1% patients belonged to lower socio-economic strata (Kuppuswamy scale III, IV, V). In our study also, majority belonged to lower socioeconomic strata. This indicates that poor purchasing power, unavailability of food and improper distribution makes the children susceptible to malnutrition despite higher level of literacy that was found in our study. In our study exclusive breastfeeding up to 6 months was given in 75.4% and mixed feeding in 24.6% cases.10 (71.4%) of them being bottle fed. In 64.3% cases, cow's milk was given. In our study, average age of start of complementary feeding was 7.93±1.13 months. In studies by Choudhary M et al.[6] and Devi RU et al.[1] the corresponding age was11.6±3.5& 7.04±2.31 months. Over-diluted cow's milk was the most common top milk supplementation in our study whereas Choudhary M et al.[6] reported it to be goat's milk.

Conclusion:

Malnutrition is a sociocultural problem. Poor socioeconomic status, parental illiteracy and lack of knowledge about appropriate feeding practice contribute towards severe malnutrition. To reduce the prevalence of malnutrition, these social issues need to be addressed. In our study 75% of patients were below age of 2 yrs. Therefore, the risk of developing severe malnutrition is in the children who are below 2 yrs. In majority of cases complementary feeding was delayed as well as inadequate (89%).Exclusive breastfeeding for 6 months and timely introduction of complementary feeds is must to prevent malnutrition. In our study literacy rates among mothers were found to be high; only 2% were illiterate. Despite high literacy rate occurrence of severe malnutrition indicates that illiteracy is not the sole cause of the severe malnutrition but the lack of knowledge about feeding of infant and young child could be the cause of underlying malnutrition. Targeted

approach to educate the mothers in respect of early and exclusive breastfeeding, timely and adequate complementary feeding has to be done at each encounter with physician.

References

1. Devi RU, Krishnamurthy S, Bhat BV, Sahai A. Epidemiological and Clinical Profile of Hospitalized Children with Moderate and Severe Acute Malnutrition in South India. *Indian J Pediatr*. 2015; 82(6):504-510.

2. Black RE, Allen LH, Bhutta ZA, et al. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet*. 2008; 371(9608):243-260.

3. Ashworth A, Chopra M, McCoy D, et al. WHO guidelines for management of severe malnutrition in rural South African hospitals: effect on case fatality and the influence of operational factors. *Lancet*. 2004; 363(9415):1110-1115

4. WHO. *Pocket Book of Hospital Care for Children: Guidelines for the Management of Common Childhood Illnesses*. 2013.

5. Horton R. The coming decade for global action on child health. *Lancet*. 2006; 367(9504):3-5.

6. Khera A. Operational Guidelines. *Minist Fam Welf*. 2011; 1(1):84

7. Das S, Paul DK, Bhattacharya M, Basu S, Chatterjee A, Sen S. Clinicoepidemiological Profile , Risk Factors and Outcome of Severe Acute Malnutrition Children at the Nutritional Rehabilitation Centre of a Tertiary Care Centre in Eastern India- A 4 Years' Experience. 2017; 5(2):2-9.

8. Kim MH, Cox C, Dave A, et al. Prompt Initiation of ART With Therapeutic Food Is Associated With Improved Outcomes in HIV-Infected Malawian Children With Malnutrition. *JAIDS J Acquir Immune Defic Syndr*. 2012; 59(2):173-176.