

Children with Severe Acute Malnutrition, Aged 5 to 60 Months, Admitted to Department of Pediatrics MMC Mardan, Pakistan Clinical Profile and Outcomes

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ABSTRACT

Objective: The current study's goals were to ascertain the prevalence of , the clinical profile associated with , including risk factors, co-occurring diseases, and the kind of , as well as to ascertain how would fare following hospitalization and treatment.

Study Design: Single Center study

Place and Duration of Study: This study was conducted at the department of Pediatrics, department of pediatrics mmc mardan Pakistan from Jan 2020 to Jan 2021.

Materials and Methods: Following compliance with the inclusion criteria, 100 infants between the ages of 5 and 62 months were enrolled in the research. Data from the past, the clinic, and the lab were entered into a pre-made proforma. Using the suitable statistical methodology, data were evaluated.

Results: Severe acute malnutrition is present in 02.09% of the population. The study population's average age is 20.76 13.80 months. Out of the 100 kids, 69% were male and 31% were female. There were more non-edematous (57%) than edematous (43%). The age range from 0 to 26 months had the highest incidence (67%). 95% of the cases (almost all) were from low SES. Mothers just attended basic school or had no education (76%). EBF was only present in 17% of instances up to the age of six months. The most common clinical symptoms were vomiting (35%), diarrhea (69%), fever (67%), anorexia (65%), ARI (57%), and eye difficulties (34%). Anemia (87%), pneumonia (41%), worm infestation (39%) were the most common comorbid illnesses, followed by UTI (33%) and TB (16%). 54% of recoveries are made. The typical hospital stay lasts 10.28 days. 2 kids (4%) died while they were hospitalized.

Conclusion: The most serious kind of malnutrition, severe acute malnutrition is a medical emergency that needs immediate intervention. It is probable to disrupt the vicious cycle of undernourishment and infection with prompt diagnosis and management of many risk factors, clinical and comorbid conditions, and hence improve result.

Keywords: female literacy, Severe acute malnutrition, socio-economic status, wasting

INTRODUCTION

The most important health issue impacting children worldwide in the twenty-first century is malnutrition, which is far more common in underdeveloped nations like Pakistan. Malnutrition causes a lot of child deaths every day, either directly or indirectly. Most of these fatalities may be avoided with the right care and nutritional treatment. One distinct kind of severe malnutrition is known as severe acute malnutrition (SAM). The highest morbidity and death rates among malnourished children are caused by this severe and potentially fatal type of malnutrition in children.² In 2018, there were over 21 million children under the age of five who were affected globally.³ This unique categorization has been suggested by the World Health Organization (WHO) for detecting and treating children with severe malnutrition. Any of the following conditions is considered a sign of severe acute malnutrition. i) a weight below the median WHO growth reference of three standard deviations (SD or Z score) for height or length ii) having bipedal nutritional edema, or iii) having an upper arm circumference in the age range of 05 month to 62 month that is less than 115 mm.⁴ Children with are concentrated in south and southeast Asia and Sub-Saharan Africa, where they make up a great majority (over 90%). India has the highest percentage of chronically malnourished children in the world, and it is the nation where over 21% of children under five die each year. Roughly 3.4 million of these infants do not live to see their first birthday, one year old.⁵ In Pakistan, 8.6% of malnourished children are badly wasted (weight for height -3 SD), while in Sindh, 6.04% of children under the age of five are severely wasted, according to the National Family Health Survey report.⁶ These youngsters are considered to have severe acute malnutrition since wasting is a sign of acute malnutrition. An improved result is linked to better clinical characterisation, triage, and proper treatment of problems upon admission, as well as nutritional therapy and targeted supportive care as stated in the WHO guideline.⁷ Each location or area has a unique clinical profile

of severe acute malnutrition. Understanding the child health profile in various locations would assist to allow optimal targeting and prioritization of intervention and resource allocation since the underlying clinical causes, co-morbidities, and health system architecture vary in different locations and nations.⁸ In this southern part of India, a landlocked area with a population that is heterogeneous in terms of ethnicity, multilingualism, religion, and cultural customs with the rest of the nation, there is a broad range of nutritional diseases. Even though Pakistan's economy has greatly improved, the incidence of malnutrition, particularly severe acute malnutrition, is still quite high. 6.2% of severely wasted children who are malnourished account for 8.6% of the total. Acute severe malnutrition has a distinct clinical presentation depending on where it occurs. Prioritizing interventions and resource allocation will be made easier with an understanding of the health profiles of children in various geographic areas.

MATERIALS AND METHODS

This hospital-based, single-center research was carried out in Pakistan between January 2020 and January 2021 at the Pediatrics Department of the MMC Mardan. The research comprised 100 kids between the ages of 5 and 59 months who were hospitalized to the department with symptoms due to severe acute malnutrition. The study population was based on Barak Valley, Alaska, as well as other states. The kids were included in the research if they met the following inclusion and exclusion criteria. Wt for Height/Length -3 SD or Z score of median WHO Growth Reference are the inclusion criteria. Foot nutritional edema (MUAC 11.5 cm) is condition number two. Children with nutritionally unsound reasons are excluded. children who have congenital defects, such as mental retardation, cerebral palsy, chronic renal illnesses, and congenital chronic hemolytic anemia. Before include parents in the research, their informed agreement was obtained. In a pre-designed proforma, certain clinical and

laboratory data were recorded. An electronic weighing scale with a sensitivity of 10 gm, an infant meter, a stadiometer, and a thin, flexible measuring tape without stretch were used for the anthropometry. Using the WHO MGRS standard deviation table, the Z score was determined.⁹ Routine laboratory tests, including those for stool and urine for routine and culture, blood sugar (R), hemoglobin level, serum electrolytes, TC, DLC, X-Ray chest, and mantoux test, were performed. When required, more precise testing were conducted. All patients were treated therapeutically in accordance with WHO guidelines. Cases were released when they satisfied the following criteria:

- 1 A satisfactory weight gain is one that exceeds 14% of the starting weight.
- 2 The swelling decreased.
- 3 A rekindled hunger pang.
- 4 The management of medical conditions.

Statistical Analysis: The Statistical Package for Social Sciences (SPSS 28.0 version) was used to statistically analyze the data.

RESULTS

the frequency of. In our research population as a whole, the prevalence of severe acute malnutrition is 02.09%. Tables 1, 2, and 3 show sociodemographic profile, baseline parameters, clinical profile, and result.

Table 1: Patient distribution based on initial features (n = 100)

| | |
|--|---|
| Gender (Male, Female) | n (%) 68(68%) 32(32%) |
| Age in months (mean) 05 -13(09.02) 14 -25 (17.3) 26 -37 (33.8) 38 -50 (46.3) 51 -60 | 36 (36%) 32 (32%) 16(16%) 16 (16%) |
| Religion (Hindu, Islam, Christian) | 42(42%) 56(56%) 02 (2%) |
| Socio economic (Status Lower Upper lower Middle Upper) | n (%) 20(20%) 76(76%) 03 (4%) 01 (0%) |
| Parental literacy Illiterate/upto Primary. Mother (Father) Upto high school (Mother Father) | 78(78%) 40(40%) 22(22%) 60(60%) |

Table 2: Distribution of patients according to Clinical profile (n = 100)

| 01.Risk factors n(%) | 02. Typen(%) | 03.Clinical Presentationon n(%) | 4.Co-morbity n(%) |
|---|--|---|---|
| [Low SES] 96(96%) [No EBF] 84(84%) [Low matemaleducation 78(78%) [Delayed & thin complementary [feed] 70(70%) [Incomplete immunization] 70(70%) | [Non edematous] 62(62%) [Edematous] 38(38%) | Diarrhoea 70(70%) Fever 68(68%) Anorexia 66(66%) ARI 56(56%) Vomiting 38(38%) Eye problem 38(38%) Hypoglycemia 14(14%) | Anemia 86(86%) Pneumonia 42(42%) Worm infestation 40(40%) UTI 38(38%) TB 16(16%) |

Table 3: Finding Of Study Outcome

| Recovery (Wt gain >16% of admission wt) n(%) | Non respondent (Wt gain <10gm/kg/day) n(%) | Average Wt gain gm/kg/day | Defaulters n(%) | Duration of hospital stay. days (mean) | Death n(%) |
|---|---|------------------------------|--------------------|---|------------|
| 54(54%) | 30(30%) | (07.03) | 12(12%) | 11.27±05.82 | 4(4%) |

DISCUSSION

The prevalence of in our research is 02.09%, which is lower than the national rate (07.08%, NFHS-03). A S Bhadoria¹¹ from northern India and H D Shewade¹² from Puducherry both observed a similar incidence of 04.4% and 5.5%, respectively. The prevalence of differs greatly amongst Indian states.

According to our observations, there were approximately twice as many male as female offspring (69% vs. 31%). Few employees saw similar results.^{13,14} However, M B Sing¹⁶ and S Rao¹⁷ reported that females had a greater rate of. Our study's higher incidence of boys may reflect the fact that, owing to social attitudes, male children get greater attention while receiving medical treatment.

Although the bulk of the population in our research is Hindu, there are more Muslim children (57%) than Hindu children. We were unable to find any correlation between religious affiliation and prevalence. This can be due to the short sample size and requires more socio-demographic research.

The study population had a mean age of 20.76 13.80 months. The age range of 6 to 26 months accounts for two thirds (67%) of all cases. Aguaya et al. have revealed similar findings in research conducted in Jharkhand. where 76.4% of the patients were children under the age of 3.16

In our analysis, there were more incidences between 6 and 12 months. This could be caused by insufficient (thin) diet, late introduction of supplemental feeds, or closer spacing between

births.

95 percent of the patients in our research (Kuppuswamy scale IV and V) are from lower socioeconomic classes. There are no examples in the higher S E class. This demonstrates the scarcity of food, low buying power, and ignorance about nutrition in a low-income neighborhood. Similar findings were also found in other studies.¹⁸ (76%) of the moms and 40% of the dads of the children were illiterate or had only completed basic school.

Only 28% of moms had completed high school. The most significant risk factors for malnutrition are parental education, particularly women's literacy. A more educated mother will be more concerned with their children's health, a balanced diet, and nutrition. Numerous research from Bangladesh and India (19, 20) found a connection between child malnutrition and poor parental education.

84% of the infants were not exclusively breastfed until they were 6 months old. Similar to this, 70 (70%) youngsters started supplemental feeding with thin or watery food later than usual. Most of these instances were caused by poor supplementary feeding and non-EBF in children under the age of two. K Mishra et al. made same findings in their investigation.²¹ There were 78 and 70%, respectively, of other risk variables found, including poor maternal education and inadequate vaccination. In our research, non-edematous instances outnumbered edematous ones by 62% out of 100 cases.

The most frequent clinical manifestations were diarrhea

(69%) and fever (67%) and were followed by anorexia (65%), ARI (57%), vomiting (34%), ocular difficulties (33%), and hypoglycemia (14% of patients). R Kumar et al.²² reported similar results in their investigation.

43 kids (87%) with co-morbid illnesses exhibited anemia of varied degrees. Other co-morbid disorders that were more prevalent were pneumonia (41%), worm infestations (39%), UTI (33%) and TB (16%).

These results are in line with earlier studies.²³ According to an examination of the patients' outcomes in this research, 54% of them had a full recovery (weight gain >16% of admission wt), whereas 30% did not (weight gain 10gm/kg/day). The average daily weight increase was 7.5 gm/kg, and the mean hospital stay was 20.76 13.80 days. Two (4% of the total) and six (12%) youngsters died while hospitalized. In their research, they found that the average weight gain was 7.3 gm/kg/day, the typical hospital stay was 14.4 days, the average recovery rate was 46.8%, and the average release rate was 53.2%.²⁴

CONCLUSION

The most serious and life-threatening kind of malnutrition, severe acute malnutrition requires immediate intervention. The vicious cycle of undernourishment and infection is likely to be broken by prompt diagnosis and management of numerous risk factors, clinical problems, and co-morbid disorders, which will enhance outcomes.

Conflict of Interest: No author has declared a conflict of interest for the research.

REFERENCES

- Ashworth A, Khanum S, Jackson A, Schofield C. Guidelines for the inpatient treatment of severely malnourished children. 2003, Geneva: World Health Organization 2003.
- Caulfield LE, de Onis M, Blossner M, Black RE. Under nutrition as underlying cause of child health associated with diarrhoea, pneumonia and measles. *Am J Clin Nutr* 2004; 80(1): 193-198.
- UNICEF. Management of severe acute malnutrition in children: working towards result at scale. New York; 2015.
- World Health Organization. Guideline: Updates on the management of severe acute malnutrition in infants and children. World Health Organization 2013.
- UNICEF Geneva, Switzerland. The state of the world's children 2008. Child survival in Geneva UNICEF flagship report.
- International Institute for Population Sciences (IIPS) and ICF 2017. National Family Health Survey (NFHS-4), 2015-16. India, Mumbai. IIPS.
- Maitland K, Berkley JA, Shebbe M, Peshu N, English M, Newton CR. Children with severe malnutrition, can those at highest risk of death be identified with the WHO protocol? *PLoS Med* 2006;3(12): e 1000-10.
- Black RE, Morris SS, Bryce J. Where and why are 10 million children dying every year? *Lancet* 2003; 361(9376): 2226-34. Onis M de. WHO child growth standards: length/height for age, weight for age, weight for length, weight for height and body mass index for age: method and development. Geneva: World Health Organization, Department of Nutrition for Health and Development 2006.
- Indian Academy of Pediatrics (IAP). IAP guidelines 2006 for hospital based management of severely malnourished children (adapted from WHO guidelines). *Ind Pediatr* 2007;44:443-61.
- Bhadoria AS, Kapil U, Mohan A. Prevalence of severe acute malnutrition and associated sociodemographic factors among children aged 6 months to 5 years in rural population of Northern India: A population based survey. *J Family Med Prim Care* 2017;6(2): 380-385.
- Shewade HD, Sunderamurthy B, Jayakumar N, Ramadoss P. Prevalence of acute severe malnutrition among under five children: A community based cross sectional study from Puducherry, India. *Ind J Matern Child Health* 2013;15:1-5.
- Aneja B, Sing P, Tandon M, Pathak P, Sing C. Etiological factors of malnutrition among infants in two urban slums of Delhi. *Ind Pediatr* 2001;38(2) 160-165.
- Asraf S, Javed MT, Abbas N, Aysha H, Hameed S. Malnutrition in diseased children with reference to age, sex, socio-economic status and area of living. *Int J Agri Biol* 2001;3(4): 419-422.
- Sing MB, Fotedar R, Laxminarayan J, Anand PK. Studies on nutritional status of children aged 0-5 years in a drought affected desert area of western Rajasthan, India. *Public Health Nutr* 2006; 9(8):961-967.
- Rao S, Joshi SB, Kelkar RS. Change in nutritional status and morbidity over time among preschool children from slums in Pune, India. *Ind Pediatr* 200; 37(10): 1060-1067.
- Aguayo VM, Jacob S, Badgaiyan N, Chandra P, Kumar A, Sing K. Providing care for children with severe acute malnutrition in India: new evidence from Jharkhand. *Public Health Nutr* 2014; 17(1):206-11.
- Poonam K, Kaur R, Sing T, Miller J, Sandhu AK, Jyoti. Prevalence and socio-demographic determinants of malnutrition in rural communities of district Fatehgarh Sahib, Punjab. *Curr Res Nutr Food Sci J* 2017;5(3): 374-382.
- Hasan MT, Soares Magalhaes RJ, Williams GM, Mamun AA. The role of maternal education in the 15 years trajectory of malnutrition in children under 5 years of age in Bangladesh. *Matern Child Nutr* 2016; 12: 929-939.
- Meshram II, Arlappa N, Balakrishna N, Rao KM, Laxmaiah A, Brahmam GN. Trends in the prevalence of under nutrition, nutrient & food intake and predictors of under nutrition among under five year tribal children in India. *Asia Pacific J Clin Nutr* 2012.
- Mishra K, Kumar P, Basu S, Rai K, Aneja S. Risk factors for severe acute malnutrition in children below 5 years of age in India: A case control study. *The Ind J Pediatr* 2014;81(8): 762-5.
- Kumar R, Sing J, Joshi K, Sing HP, Bijesh S. Comorbidities in hospitalized children with severe acute malnutrition. *Ind Pediatr* 2014;51(2): 125-127.
- Garg M, Devpura K, Saini SK, Kumara S. A hospital based study on co-morbidities in children with severe acute malnutrition. *J Pediatr Res* 2017;4(1): 82-88.
- Sing K, Badgaiyan N, Kushwaha KP. Management of children with severe acute malnutrition in India: Experience of Nutrition Rehabilitation Centre in Uttar Pradesh, India. *Ind Pediatr* 2012;49:181-185.