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Frequency of Leading Factors of Severe Acute Malnutrition in Children Below Five Years of Age Attending National Institute of Child Health, Karachi

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Aim: To determine the frequency of leading factors of severe acute malnutrition in children below five years of age.
Study Design: Cross-sectional study.
Place and Duration of Study: Outpatient department, National Institute of Child Health (NICH) Karachi from December 7, 2017 to June 9, 2018.
Methodology: All children of 6 months to 5 years of age of either gender presented with severe acute malnutrition were included. Information regarding age, gender, weight, height and all leading factors of severe acute malnutrition were noted.
Results: Out of total 157 children, pre-maturity was observed in 21 (13.4%) children, low birth weight in 84 (53.5%) children, anemia in 105 (66.9%) children, lack of complete immunization in 81 (51.6%) children, maternal illiteracy 96 (61.1%), paternal illiteracy 31 (19.7%), low income 116

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(73.9%), lack of exclusive breastfeeding in 87 (55.4%) children, administration of Pre-lacteals as the first feeding in 54 (34.4%) whereas initiation of complementary feeding after nine months was observed in 48 (30.6%) children.

Conclusion: The presence of low income, anemia, maternal illiteracy, lack of exclusive breastfeeding and low birth weight were the leading factors of severe acute malnutrition in children below the age of five years.

Keywords: Leading factors; severe acute malnutrition; children under five years.

1. INTRODUCTION

Acute Malnutrition is a lethal global problem. About 55 million children below the age of 5 years suffer acute malnutrition, all over the world. About 26 million children suffer severe acute malnutrition, most of them belong to Africa and South Asia [1,2]. Malnutrition is associated with 3.5 million childhood death per year, while severe acute malnutrition causes 1 million death per year [3]. Severe acute malnutrition is a lethal disorder. It is concomitantly associated with common infections, causing death of children. Comparing well-nourished children death rate is nine times higher in malnourished children [4].

In a study, factors leading to severe acute malnutrition in children below the age of five years were reported as maternal illiteracy 60.52%, paternal illiteracy 22.36%, low income 72.36%, lack of complete immunization 42.1%, and lack of exclusive breast feeding in the first 6 months 44.73%, initiation of complementary feeding after 9 months as 43.42%, prelacteal feeding 64.4% and anemia 40.4% [5]. Another study has reported pre-maturity 18% and low birth weight 44% as the leading factor for severe acute malnutrition in children below the age of five years [6].

Despite, lots of efforts on maternal and child health related issues malnutrition is still a barrier in reducing child morbidity and mortality especially in developing and resource countries. W.HO is still working hard on this issue to assess the current burden of malnutrition. Therefore the present study is designed to assess the current magnitude of various factors leading to malnutrition locally thereby strategies could be devised to minimize the morbidity in children under 5 years of age.

2. METHODOLOGY

2.1 Operational Definitions

Severe acute malnutrition was defined as per WHO criteria for severe acute malnutrition in children below the age of five years. A mid-upper arm circumference <115 mm, or a weight-for height/length < –3 Z-scores or having bilateral pitting edema was considered as “severe acute malnutrition”.

Pre-maturity: gestational age of <37 weeks, was noted by taking history from mothers at the time of presentation.

Low birth weight: <2500 Kg weight at the time of birth, was noted by taking history from mother at the time of presentation.

Anemia: Hemoglobin concentration less than 110 g/L at the time of presentation.

Lack of complete immunization: A child who missed one dose of the EPI as per age specific EPI schedule, was confirmed by the vaccination card.

Maternal illiteracy: Mother with no school education.

Paternal illiteracy: Father with no school education.

Low income: average daily household income less than Rs. 500/day.

This Cross-sectional study was conducted at Outpatient department, National Institute of Child Health (NICH) by Non-probability consecutive sampling from December 7, 2017 to June 9, 2018.

Permission was taken from the Research Evaluation Unit (REU) of College of Physician and Surgeon Pakistan (CPSP). Epi Info sample size calculator was used for the estimation of sample size; taking confidence interval of 95%, margin of error as 6%, reported pre-maturity 18%,10 sample size came out to be 157. Children 6 months to 5 years of age of either gender having severe acute malnutrition were included. Children having chronic illnesses like TB, any congenital abnormality like cleft or lip

palate or severe neurological problem like Cerebral Palsy were excluded from the study.

Eligible children meeting the inclusion criteria were enrolled in the study. Before enrolment, the pros and cons of the study were explained and confidentiality was ensured to the parents and signed informed consent was taken. Information regarding age, gender, weight, height all leading factors like Prematurity, low birth weight, anemia, lack of complete immunization, maternal illiteracy, paternal illiteracy, low income, lack of exclusive breastfeeding in the first 6 months, administration of pre-lacteals as the first feeding and initiation of complementary feeding after 9 months was noted in the proforma.

Data were analyzed by using SPSS version 21. Mean and standard deviation was calculated for age, weight, height, and BMI of the patients. Frequency and percentages was calculated for gender and leading factors like pre-maturity, low birth weight, anemia, lack of complete immunization, maternal illiteracy, paternal illiteracy, low income, lack of exclusive breast feeding in the first 6 months, administration of pre-lacteals as the first feeding, initiation of complementary feeding after 9 months. Chi-square test was applied to see the association of age, gender and BMI on the outcome. P-value <0.05 was taken as significant.

3. RESULTS

Out of total 157 children, mean age of children was 3.36 ±1.14 years (Table 1). There were 90 (57.3%) children with ≤3 years and 67 (42.7%) children with >30 years of age. Mean weight, height and BMI of the children was 17.35 ±2.26 kg, 105.21 ±8.60cm and 15.87 ±0.81 kg/m2 respectively. Majority of the children (n=132, 94.1%) were presented with >15 kg/m2 BMI. (Table 1). There were 77 (49%) males and 80 (51%) females.

Presence of pre-maturity was observed in 21 (13.4%) children, low birth weight in 84 (53.5%) children, anemia in 105 (66.9%) children, lack of complete immunization in 81 (51.6%) children, maternal illiteracy 96 (61.1%), paternal illiteracy 31 (19.7%) low income 116 (73.9%), lack of exclusive breastfeeding in 87 (55.4%) children, administration of Prelacteal as the first feeding in 54 (34.4%) whereas initiation of complementary feeding after nine months was observed in 48 (30.6%) children (Table 2).

Comparison of leading factors with respect to baseline characteristics was done. Significant association was found only in between gender and presence of anemia (p-value 0.027) whereas all other associations were found to be insignificant (p-value >0.05) (Table 3).

Table 1. Demographic characteristics (n=157)

Age (years)	**Mean ± SD**
	3.36 ± 1.14
Weight (KG)	17.35 ± 2.26
Height (CM)	105.21 ± 8.60
BMI (KG/m^2)	15.87 ± 0.81
Age <3 Years	99 (57.30%)
Age >3 Years	67 (42.70%)
BMI <15	25 (15.90%)
BMI >15	132 (84.10%)
Male	77 (49%)
Female	80 (51%)

Table 2. Leading factors for Severe Acute Malnutrition (n=157)

Prematurity	**21 (13.40%)**
Low Birth Weight	84 (53.50%)
Anemia	105(66.90%)
Lack of Complete immunization	81 (51.60%)
Maternal illiteracy	96 (61.10%)
Paternal illiteracy	31 (90.70%)
Low Income	116 (73.90%)
Lack of Exclusive Breast feeding	87 (55.40%)
Pre Lacteals feeds	54(34.40%)
Complementary Feeding after 6 months of age	48 (30.60%)

Table 3. Comparison of anemia with age, BMI and gender of the children (n=157)

	Anemia		Total	P-value
	Yes	No		
Age (years)				
≤ 3	61(67.8)	29(32.2)	90(100)	
≥3	44(65.7)	23(34.3)	67(100)	0.782
BMI (kg/m^2)				
≤ 30	18(72)	7(28)	25(100)	
≥30	87(65.9)	45(34.1)	132(100)	0.553
Gender				
Male	58(75.3)	19(24.7)	77(100)	
Female	47(58.8)	33(41.3)	80(100)	0.027

4. DISCUSSION

In our study, Out of total 157 children, pre-maturity was observed in 21 (13.4%) children, low birth weight in 84 (53.5%) children, the results are compatible with a study in which birth weight <2.499kg was significantly associated with sever acute malnutrition [7]. In this study Severe Acute Malnutrition was most common in age <3 Years 99 (57.30%). In a similar study from Nepal malnutrition was common in age group 6-24 months [8].

This study shows that anemia was found in 105 (66.9%) children and lack of complete immunization was in 81 (51.6%) children, while in an unsimilar study from South Africa 97.4% were immunized up to date. The reason of severe acute malnutrition was diarrhea in their study [9]. In our study maternal illiteracy was present in 96 (61.1%), paternal illiteracy 31 (19.7%) cases. Our results were similar to a study in which paternal education level 0–8, was associated with severe acute malnutrition [10]. Although fathers can play a role in maternal nutrition of their wives before and during pregnancy for the reduction of malnutrition in children but in our study as others factors were also present that's why fathers education could not reduce the malnutrition in their children.

While in another study results were different from our study, in which mothers' age at marriage or literacy status was not associated with malnutrition in children [11].

Although in our study we not included family size as a risk factor for malnutrition but in a study family size of 5 or more members was significantly associated with severe acute malnutrition [12]. In our study low income of parents was present in 116 (73.9%) cases that is compatible with a local study in which lower socioeconomic status was associated with malnutrition in children [13].

Our study shows lack of exclusive breastfeeding was present in 87 (55.4%) children and administration of Pre-lacteals as the first feeding was in 54 (34.4%) whereas initiation of complementary feeding at six months of age was observed in 48 (30.6%) children. In an international study early introduction of complementary foods was associated with increased risk of malnutrition by about two times [14]. In another similar study about 352 (41.9%) of children received pre-lacteal feeding mostly animal milk and butter [15,16].

In our study, Comparison of leading factors with respect to baseline characteristics was done. Significant association was found only in between gender and presence of anemia (p-value 0.027) whereas all other associations were found to be insignificant (p-value >0.05). In a similar local study from Pakistan Vaccines, infections, breastfeeding, family income and parental education status were significantly associated with the severe acute malnutrition [17].

5. CONCLUSION

The presence of low income, anemia, maternal illiteracy, lack of exclusive breastfeeding and low birth weight were the leading factors of severe acute malnutrition among children under five years of age.

CONSENT

As per international standard, parental written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Essential Nutrition Services to Underfive Children in Yemen: A programmatic adaptation amidst the COVID-19 Pandemic. Children. 2021;8(5):350.
2. Trehan I, Goldbach HS, LaGrone LN, Meuli GJ, Wang RJ, Maleta KM, Manary MJ. Research Article (New England Journal of Medicine) Antibiotics as part of the management of severe acute malnutrition. Malawi Medical Journal. 2016;28(3):123-30.
3. World Health Organization. Children: reducing mortality. Weekly Epidemiological Record= Relevé épidémiologique hebdomadaire. 2014;89(38):418-20.
4. Deshmukh PR, Sinha N, Dongre AR. Social determinants of stunting in rural area of Wardha, Central India. Medical Journal Armed Forces India. 2013;69(3): 213-7.
5. Ambadekar NN, Zodpey SP. Risk factors for severe acute malnutrition in under-five children: a case-control study in a rural part of India. Public Health. 2016;S0033-3506(16):30189-5
6. Dukhi N. Global prevalence of malnutrition: evidence from literature. In Malnutrition 2020 Apr 5. Intech Open.
7. Ghimire U, Aryal BK, Gupta AK, Sapkota S. Severe acute malnutrition and its associated factors among children under-five years: a facility-based cross-sectional study. BMC pediatrics. 2020;20:1-9.
8. Coulibaly-Zerbo F, Al-Jawaldeh A, Prinzo ZC, Adrianopoli M, Al-Falahi EN, Alahnoumy S, Usman NM, Moqbel FA, Ali LA, Shroh M, Al-Sakkaf EM. Maintaining Essential Nutrition Services to Underfive Children in Yemen: A Programmatic Adaptation Amidst the COVID-19 Pandemic. Children. 2021 May;8(5):350.
9. Hossain A, Niroula B, Duwal S, Ahmed S, Kibria MG. Maternal profiles and social determinants of severe acute malnutrition among children under-five years of age: a case-control study in Nepal. Heliyon. 2020; 6(5):e03849.
10. Gebre A, Reddy PS, Mulugeta A, Sedik Y, Kahssay M. Prevalence of malnutrition and associated factors among under-five children in pastoral communities of Afar Regional State, Northeast Ethiopia: a community-based cross-sectional study. Journal of Nutrition and Metabolism; 2019.
11. Musa MK, Muhammad F, Lawal KM, Chowdhury AA, Hossain A. Risk factors of severe acute malnutrition among under-five children: a hospital-based study in Bangladesh. J Med Sci Health. 2017;3:13-21.
12. Hoq M, Ali M, Islam A, Banerjee C. Risk factors of acute malnutrition among children aged 6–59 months enrolled in a community-based programme in Kurigram, Bangladesh: A mixed-method matched case-control study. Journal of Health, Population and Nutrition. 2019;38(1): 1-7.
13. Itaka MB, Omole OB. Prevalence and factors associated with malnutrition among under 5-year-old children hospitalised in three public hospitals in South Africa. African Journal of Primary Health Care and Family Medicine. 2020;12(1):1-7.
14. Ahmad D, Afzal M, Imtiaz A. Effect of socioeconomic factors on malnutrition among children in Pakistan. Future Business Journal. 2020;6(1):1-1.
15. Diakité AA, Diall A, Maïga B, Dembélé A, Diakité FL, Coulibaly B, Sidibé LN, Doumbia AK, Coulibaly O, Togo P, Dembélé G. Risk Factor for Malnutrition in Children Aged 6 to 59 Months Hospitalized in a Pediatric Ward in the South of the Sahara. Open Journal of Pediatrics. 2021; 11(3):329-38.
16. David SM, Pricilla RA, Paul SS, George K, Bose A, Prasad JH. Risk factors for severe acute malnutrition among children aged 6–59 months: A community-based case-control study from Vellore, Southern India.

Journal of Family Medicine and Primary Care. 2020;9(5):2237.

17. Sand A, Kumar R, Shaikh BT, Somrongthong R, Hafeez A, Rai D. Determinants of severe acute malnutrition among children under five years in a rural remote setting: A hospital based study from district Tharparkar-Sindh, Pakistan. Pakistan Journal of Medical Sciences. 2018;34(2):260.

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