ORIGINAL ARTICLE

MALNUTRITION AMONG CHILDREN UNDER FIVE YEARS IN DISTRICT SANGHAR, SINDH, PAKISTAN

Zulfiqar Ali Laghari[1], Ali Muhammad Soomro[1], Sarfraz Ali Tunio[2], Khalid Lashari[3], Farzana Gul Baloach[1], Nimra Masood Baig[1], Shaista Bano[2]

[1]Departments of Physiology, [2]Microbiology and [3]Fresh Water Biology and Fisheries, University of Sindh, Jamshoro, Pakistan

ABSTRACT

Background: Malnutrition is a major public health problem in developing countries resulting in a high mortality rate (~60%) in children less than five years age. The malnutrition also appears to be a wide spread phenomenon in Pakistan. The aim of this study was to assess the prevalence of malnutrition in children under five in District Sanghar, Pakistan.

Material & Methods: This cross-sectional study was carried out in flood affected areas of district Sanghar, Sindh, Pakistan. A total of 511 randomly selected children were assessed for malnutrition by measuring the middle of the Upper Arm Circumference. The status of malnutrition and data of socio-economical conditions were collected by interview through structured questionnaire. Data was analyzed using SPSS software. Categorical variables such as socio-economic status, religion and caste were examined using frequency distribution; whereas continuous variables such as age and middle of the Upper Arm Circumference were examined using frequency distribution and descriptive statistics.

Results: Out of 511 children, 66.1% (n=338) were affected by malnutrition. Further analysis into the mild (≤13.5 cm), moderate (11.5-12.5 cm) and severe malnutrition (<11.5 cm) was carried out. The data demonstrated that 43.2% (n=221) children had mild malnutrition, 65 12.7% (n=65) suffered from moderate malnutrition and 10.2% (n=52) had severe malnutrition. Severe malnutrition was significantly higher ($p<0.05$) in female than male children. Malnutrition was significantly higher in younger age 6-23 months than in older children 24-59 months ($p<0.05$).

Conclusion: The present study demonstrates that overall prevalence and severity of malnutrition in female children is higher than male children.

Key Words: Malnutrition; children; Nutritional status; Anthropometry.

This article may be cited as: Laghari ZA, Soomro AM, Tunio SA, Lashari K, Baloach FG, Baig NM, et al.Malnutrition among children under five years in District Sanghar, Sindh, Pakistan. Gomal J Med Sci 2015; 13: 54-7.

INTRODUCTION

Adequate nutrition is essential in early childhood to ensure strong immune system and proper physical and mental development.[1,2] Malnutrition in children continues to be a major health problem in developing countries, especially in South-East Asia and Sub-Saharan Africa.[3] Increasing evidence suggests the majority of children around the world suffer from malnutrition. After the age of six month, the children have to take the weaning diet, which can fulfill the nutritional requirements of the children. However, in the poor community, the diet of the children does not appear to fulfill the criteria of WHO recommendation for diet. Poverty and illiteracy have been reported as the major factors that contribute to malnutrition in children less than five years age. The condition worsens when the area is affected by floods or other emergency conditions. It has been estimated that nearly 20 million children under five year age suffer from severe acute malnutrition, which contributes to the death of nearly one million children per year.[4] High mortality rate resulting due to malnutrition has been reported in developing countries and the factors which contribute in malnutrition are reduced food intake due to poverty and infectious diseases caused by weak immunity in malnourished children.[5,6]

In Pakistan, malnutrition has been shown to be associated with poverty and illiteracy.[7] Number of studies from Pakistan reports the prevalence of malnutrition in children less than five year of age.[8-10] This higher prevalence of malnutrition in developing

Corresponding Author:
Dr. Sarfraz A. Tunio
Associate Professor
Department of Microbiology
University of Sindh
Jamshoro, Sindh, Pakistan
E-mail: sarfraz.tunio@usindh.edu.pk

countries particularly Pakistan is associated with stunted growth and high mortality rate.[11,12] The study conducted on children indicated that 49.3% children had malnutrition;[13] however, study on hospitalized children of pediatric unit of Lady Reading Hospital (LRH), Peshawar showed 30.12% malnutrition in children aged less than 5, and 13.6% mortality rate in these hospitalized children.[14] Another study reported 16.2% mortality rate in the hospitalized children of Karachi.[15] Prevalence of malnutrition is lot higher in Sindh than other reported areas. In Dadu district of Sindh, prevalence of malnutrition was 61% in children under the age of five years, the similar study reported the malnutrition is being the major contributor in stunted growth of children.[16] These studies suggest the rate of malnutrition is higher in Pakistan, particularly in Sindh Province.

Various anthropometric indicators have been applied to determine the nutritional status in children.[17] These indicators include stunting (height-for-age), wasting (weight-for-height) and underweight (weight-for-age). However, measurements of middle of the Upper Arm Circumference (MUAC) has been adopted an easy, quick and precise method to detect malnutrition in children under five year age group[18] MUAC is better indicator to observe nutritional status in children in emergency situations.[19] Present study investigated the prevalence of malnutrition in flood affected district Sanghar, Pakistan using MUAC as anthropometric indicator. This study aimed to study the prevalence of malnutrition among male and female children of district Sanghar, Sindh, Pakistan.

MATERIAL AND METHODS

The present cross-sectional study was conducted at flood affected areas of Sanghar District, Pakistan, from April 2012 to April 2013. A total 511 children, aged between 6-59 months, belonging to low socio-economic background from rural communities were included in study. Out of 511, 246 were females and 265 were males. Chronically ill children were excluded from study.

At first the flood affected areas of district Sanghar were selected for collection of data. Team of research assistants approached the area where the parents of children were taken into confidence. Age was determined by asking the date of the birth, or by examining the birth certificate or vaccination card or by using local events calendar and then screening was carried out using middle upper arm circumference, which is an effective measure of assessing malnutrition in emergency situation. Measurements of MUAC (to the nearest 1.0 mm) were made using measuring tape also known as Shakir's tape.[20] Shakir's tape is widely used for the assessment of nutrition status of children under five. Informed verbal consent was taken from the heads of households. They were assured of confidentiality of the data.

Data was analyzed using SPSS software. Association of malnutrition with MUAC was computed using Odd Ratio with 95% confidence interval. A p value less than 0.05 was considered as indicative for a statistically significant difference. Categorical variables such as socio economic status, religion and caste were examined using frequency distribution; whereas the continuous variables such as age and MUAC were examined using frequency distribution and descriptive statistics.

RESULTS

Among various anthropometric indicators that are used to assess the nutritional status in children, MUAC is considered an easy, quick and precise method to detect malnutrition in children less than five year age especially in emergency situations such as flood affected areas. The data (Table 1) showing age and sex wise specific mean (SD) of MUAC with minimum and maximum values clearly indicated that the mean MUAC was higher in boys than girls at all ages. The prevalence of malnutrition with all its types is presented in Table 2. A total of 511 children less than five year age were studied. Of these, 388 (66.1%) children were observed to suffer from malnutrition, out of these 388 malnourished children 164 were males and 174 were females. There was no obvious difference in prevalence of mild and moderate nutrition both in male and female children. However, female children showed higher percentage (13.6%) of severe malnutrition as compared to male children (6.5%). The prevalence of malnutrition was found higher in younger children aged 6-11 months, and overall malnutrition decreased with age. The lowest overall malnutrition was found in older age group children. However, the severe malnutrition was higher in older children than in younger children. No difference in prevalence of overall malnutrition was found between boys and girls. However, girls demonstrated significantly higher ($p<0.001$) severe malnutrition. The data in Table 4 shows that malnutrition decrease with age, the younger children were significantly ($p<0.001$) at more risk. The children between the ages of 6 to 11 months were used as reference.

DISCUSSION

Present study reports the level of malnutrition in flood affected areas of District Sanghar, Sindh. Children under five are more vulnerable to malnutrition in emergency conditions because of their inability to access the prevalence of malnutrition using MUAC has been an under studied area, thus present study was conducted using MUAC. In the present study, 511 children (less than 5 year age) from both genders (male and female) belonging to the low social economic backgrounds were studied. This study therefore reasonably reflects the status of nutrition in flood affected areas. Similar studies on malnutrition in emergency conditions have been conducted

Table 1: The mean MUAC of male and female children.

	Boys MUAC (cm)			Girls MUAC (cm)		
Age in months	**Mean (SD)**	**Min**	**Max**	**Mean (SD)**	**Min**	**Max**
6-11	12.56(1.06)	9.8	14.6	12.70)1.53)	8.6	14.6
12-23	13.55(1.02)	11.8	14.9	12.91(1.44)	9.2	16.5
24-35	13.26(1.22)	10.2	16.4	12.92(1.86)	8.7	15.2
36-47	13.38(1.45)	9.3	16.5	13.00(1.89)	8.7	16.4
48-59	14.65(1.54)	12.1	16.5	14.36(1.53)	11.9	16.5
6-59	13.36(1.35)	9.3	16.5	13.09(1.63)	8.6	16.5

Table 2: Age and sex-wise prevalence of malnutrition in children.

	Malnourishment					
	Normal	**Mild**	**Moderate**	**Severe**	**Overall**	**Total**
Gender						
Male	82(33.3)	113(45.9)	35(14.2)	16(6.5)	164(66.7)	246(48.1)
Female	91(34.3)	108(40.7)	30(11.3)	36(13.6)	174(65.7)	265(51.9)
Age in months						
6-11	13(14.5)	57(63.3)	11(12.2)	9(10)	77(85.5)	90(17.6)
12.23	23(23.5)	47(48)	22(22.4)	6(6.1)	75(76.5)	98(19.2)
24.35	42(33.1)	59(46.4)	10(7.9)	16(12.6)	85(66.9)	127(24.8)
36.47	60(42.85)	44(31.42)	17(12.14)	19(13.57)	80(57.14)	140(27.4)
48.59	35(62.5)	14(25)	5(8.9)	2(3.6)	21(37.5)	56(11)
Total	173(33.9)	221(43.2)	65(12.7)	52(10.2)	338(66.1)	511(100)

Table 3: The odd ratio and p value in male and female children.

Gender*	**Malnutrition**					
	Mild		**Moderate**		**Severe**	
	OR (95% CI)	**P value**	**OR (95% CI)**	**P value**	**OR (95% CI)**	**P value**
Male*	1–		1–		1–	
Female	0.80 (0.657-1.14)	P00.2	0.76(0.45-1.29)	P-0.3	2.25(1.21-4.18)	P-0.001

Table 4: Age and gender-wise difference in malnutrition among children.

Variabe	**Odd Ratio (95%) CI**	**P-value**
Sex*		
Male*	1	
Female	1.04(0.72-1.50)	0.8
Age group (months)**		
6-11**	1	—
12-23	0.55(0.26-1.17)	0.1
24-35	0.34(0.17-0.68)	0.002
36-47	0.22(0.11-0.44)	0.0001
48-59	0.10(0.04-0.22)	0.0001

in various parts of the world.[21,22] Higher prevalence of malnutrition in the present study may have been influenced by the fact that samples studied were taken from the area which was severely hit by floods. Another possible explanation to this might be a wide spread poverty in affected areas.

No obvious difference was found in overall malnutrition between male and female children. No significant difference ($p>0.05$) was observed in the prevalence of mild and moderate malnutrition. However, the prevalence of severe malnutrition was significantly high in female children, which may be due to gender biased society. Our results are consistent with published data.[23,24] Higher risk of malnutrition was found in female children than in male children.[25] Moreover, The mean MUAC progressively increased

with a age and this data is consistent with available data.[19] Contrary to previously published the data demonstrating higher prevalence of malnutrition in male children, present study reports higher malnutrition (SA|M) in female children.[26] This may be due to the male dominant society. The mean MUAC was consistently lower in female children than in male children, this is consistent with already available data.[19]

CONCLUSION

The present study demonstrates that overall prevalence and severity of malnutrition in female children is higher than male children.

REFERENCES

1. Asad N, Mushtaq A. Malnutrition in Pakistani children, its causes, consequences and recommendations. J Pak Med Assoc [Letter]. 2012; 62: 311.
2. Ali SS, Karim N, Billoo AG, Haider SS. Association of literacy of mothers with malnutrition among children under three years of age in rural area of district Malir, Karachi. J Pak Med Assoc 2005; 55: 550-3.
3. Stephenson LS, Latham MC, Ottesen EA. Global malnutrition. Parasitology 2000; 121 Suppl: S5-22.
4. Nutrition Service of the World Food P. Nutrition in emergencies: WFP experiences and challenges. Food Nutr Bull 2006; 27: 57-66.
5. Chowdhury AM, Bhuiya A, Chowdhury ME, Rasheed S, Hussain Z, Chen LC. The Bangladesh paradox: exceptional health achievement despite economic poverty. Lancet 2013; 382: 1734-45.
6. Gaiha R, Kulkarni VS, Pandey MK, Imai KS. On hunger and child mortality in India. J Asian Afr Stud 2012; 47: 3-17.
7. Hirani SA. Malnutrition in young Pakistani children. J Ayub Med Coll Abbottabad 2012; 24: 150-3.
8. Ahmed T, Hossain M, Mahfuz M, Choudhury N, Hossain MM, Bhandari N, et al. Severe acute malnutrition in Asia. Food Nutr Bull 2014; 35: S14-26.
9. Akram DS, Bharmal FY, Hussain T. PediaSure in the treatment of severe malnutrition in Pakistani children. J Pak Med Assoc 2000; 50: 377-80.
10. Bhutta ZA. Addressing severe acute malnutrition where it matters. Lancet 2009; 374: 94-6.
11. Aurangzeb B, Whitten KE, Harrison B, Mitchell M, Kepreotes H, Sidler M, et al. Prevalence of malnutrition and risk of under-nutrition in hospitalized children. Clin Nutr 2012; 31: 35-40.
12. Bhutta ZA, Nizami S, Thobani S, Issani Z. Risk factors for mortality among hospitalized children with persistent diarrhoea in Pakistan. J Trop Pediatr 1997; 43: 330-6.
13. Khattak M, Ali S. Malnutrition and associated risk factors in pre-school children (2-5 years) in district Swabi (NWFP)-Pakistan. J Med Sci 2010; 10: 34-9.
14. Irshad M, Hayat M, Ahmad A, Khalil B, Hussain M. Case fatality rate and etioloical factors of malnutrition in children less than 5 years of age. J Postgrad Med Institute 2014; 28.
15. Siddique B, Memon I, Jamal A, Aslam R. Assessment of risk factors and case fatality rate of malnourished admitted children. Med Channel 2006; 12: 47-51.
16. Hasnain S, Hashmi S. Consanguinity among the risk factors for underweight in children under five: a study from rural Sindh. J Ayub Med Coll Abbottabad 2009; 21: 111.
17. Joseph B, Rebello A, Kullu P, Raj VD. Prevalence of malnutrition in rural Karnataka, South India: a comparison of anthropometric indicators. J Health Popul Nutr 2002; 20: 239-44.
18. Collins N. Assessment and treatment of involuntary weight loss and protein-calorie malnutrition. Adv Skin Wound Care 2000; 13: 4-10.
19. Dairo MD, Fatokun ME, Kuti M. Reliability of the Mid Upper Arm Circumference for the Assessment of Wasting among Children Aged 12-59 Months in Urban Ibadan, Nigeria. Int J Biomed Sci 2012 Jun; 8: 140-3.
20. Sharma KR. Malnutrition in children aged 6-59 months in Mugu district. J Nepal Health Res Counc 2012; 10: 156-9.
21. Renzaho AM. Food insecurity, malnutrition and mortality in Maewo and Ambae Islands, Vanuatu. Public Health Nutr 2006; 9: 798-807.
22. Mason JB, White JM, Heron L, Carter J, Wilkinson C, Spiegel P. Child acute malnutrition and mortality in populations affected by displacement in the Horn of Africa, 1997-2009. Int J Environ Res Public Health 2012; 9: 791-806.
23. Ferdous F, Das SK, Ahmed S, Farzana FD, Latham JR, Chisti MJ, et al. Severity of diarrhea and malnutrition among under five-year-old children in rural Bangladesh. Am J Trop Med Hyg 2013; 89: 223-8.
24. Mostafa KS. Socio-economic determinants of severe and moderate stunting among under-five children of rural Bangladesh. Malays J Nutr 2011; 17: 105-18.
25. Smith T, Heywood P. Mid-upper-arm circumference (MUAC) in relation to other indices of nutritional status in Papua New Guinea. P N G Med J 1991; 34: 26-34.
26. Ubesie AC, Ibeziako NS, Ndiokwelu CI, Uzoka CM, Nwafor CA. Under-five protein energy malnutrition admitted at the University of Nigeria Teaching Hospital, Enugu: a 10 year retrospective review. Nutr J 2012; 11: 43.

CONFLICT OF INTEREST
Authors declare no conflict of interest.
GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared.