

Nutritional Status of Bacterial Skin Infected Patients in the Dhaka Shishu (Children) Hospital Skin Out-door Department

Md. Ali Khan¹, Md. Golam Morshed², M. Ahamed Khan³ and KM Sultanul Aziz⁴

1. Dhaka WASA Laboratory, Asad Gate, Mohammadpur, Dhaka. 2. Life Science Institute, Jahangirnagar University, Savar, Dhaka. 3. Dhaka Shishu (Children) Hospital, Sher-e-Banglanagar, Dhaka. 4. Curative Medicine Department, Riyadh 11176, Saudi Arabia.

Introduction

Malnutrition is still the dominant health problem in the tropics regardless of variation in climate and race¹. The anthropometric data has been used as an important means to determine the nutritional status of under five children by a number of authors^{2,3,4}. Usually Gomez classification is used in anthropometric assessment of nutritional status⁵. In Bangladesh studies have been done to determine the nutritional status of under five children⁶. Some of these investigations were conducted to find out the interaction of different infections diseases such as upper respiratory diseases, diarrhoea, measles, typhoid, fever, pneumonia, stomatitis, chronic otitis, conjunctivities and different skin diseases with malnutrition^{7,8}, malnutrition and diseases are intricately linked^{9,10}. Malnutrition also effects on host resistance and may lead to increase the incidence of severity of infectious diseases^{11,12,13}. Impairment of surface defence and immature deficiency secondary to malnutrition enhance susceptibility to skin infections¹⁴. The problems were more common in

paediatric age group¹⁵. Malnutrition is also associated with the diminishing of normal skin protection ability. It was found that killing of *Staphylococcus aureus* and *Escherichia coli* was defective in severely malnourished children in India and Ivory Coast with Kwashiorkor¹⁶. Malnourished children were also showed susceptible to *Pseudomonas* sp. infection¹⁷. The study was conducted to evaluate the nutritional status of bacterial skin infected out-patients of Dhaka Shishu (Children) Hospital. The study also showed the possible existing relationship between the severity of malnutrition and bacterial skin infection.

Materials and Method

The study was conducted between March 1988 to February 1989 in 187 clinically diagnosed (verified later with microbiological studies) bacterial skin infected patients who attended the Dhaka Shishu (Children) Hospital skin out door department. The patients were selected randomly. Anthropometric measurements of weight and age were recorded according to the methods of Jelliffe¹⁸. A portable balance (LAICA brand balance made by LAICA Snc.

Viale del Lavoro,10 36020 Ponte di Barbarans VICENZA, Italy) was used to measure the weight in kilogram (Kg). The age was rounded upto the nearest half of completed year. Pus sample were collected aseptically and cultured on sheep Blood Agar and MacConkey Agar. All the bacteria isolated were identified by their colonial and biochemical characteristics¹⁹, Gomez classification was used as a basis of using the anthropometric indices of weight and age to determine the extent of undernutrition²⁰.

Results

Among the 187 studied bacterial skin infected patients 17 (9.09%) children were found to have normal weight-for-age and the rest 170 (90.90%) showed different degrees of malnutrition. Out of 170 malnourished children 61 (32.62%) patients had 1st degree malnutrition 66 (35.29%) and 43 (22.99%) patients had

2nd and 3rd degree malnutrition respectively. Table 1 showed age and sex distribution of different types of malnutrition according to the Gomez classification. The number of male patients were more than their female counterpart (Table 1). All the 187 studied patients showed pure or mixed form of bacterial isolation in culture. Table 11 showed the association of different isolated bacteria with the different degree of malnutrition. Pure *Staph. aureus* was found in 87 (46.52%) patients followed by mixed culture of *Staph. aureus* and *Streptococcus B-haemolyticus*, 66 (35.29%) and pure *Strepto. B-haemolyticus*, 16 (8.55%). In case of pure *Staph. aureus* infection 34 (39.08%) patients had first degree malnutrition followed by second degree malnutrition, 28 (32.18%). In case of *Staph. aureus* and *Strepto. B-haemolyticus* mixed infection first, second and third degree of malnutrition had 18 (27.69%),²²

Table 1. Age and sex wise distribution of types of malnutrition according to the Gomez Classification of the 187 studied bacterial skin infected patients.

Age group (year)	Sex	Normal >(90%)	Nutritional Status			Total
			10 (75-90%)	20 (60-74.9%)	30 (<60%)	
0-1	Male	07	14	14	12	47
	Female	06	07	07	12	32
	All	13	21	21	24	79
1-2	Male	01	12	02	10	25
	Female	00	14	03	02	19
	All	01	26	05	12	44
2-3	Male	00	07	05	01	13
	Female	00	03	06	12	09
	All	00	10	11	01	22
3-4	Male	01	00	13	02	16
	Female	00	01	10	00	11
	All	01	01	23	02	27
4-5	Male	02	01	04	02	09
	Female	00	02	02	02	06
	All	02	03	06	04	15
Total (Sex combined)		17	61	66	43	187

Table 2 : Distribution of different isolated bacteria in different malnourished skin infected children.

Isolated organism	Nutritional status				Total
	Normal	10	20	30	
<i>Staphylococcus aureus</i>	06	34	28	19	87
<i>Streptococcus B-haemolyticus</i>	04	04	06	02	16
<i>Staph. aureus + Strepto B-heamolyticus</i>	07	18	22	18	65
<i>Staph. aureus + Strepto B-haemolyticus + other bacteria</i>	00	00	03	02	05
<i>Pseudomonas sp</i>	00	00	01	01	02
<i>Strepto B-haemolyticus + Pseudomonas sp</i>	00	00	02	00	02
No growth	00	05	04	01	10
Total	17	61	66	43	187

(33.84%), and 18 (27.69%) patients respectively. It was found that patients with second degree of malnutrition had given more bacterial isolates 66 (35.29%) followed by first degree malnutrition, 61 (32.62%); third degree malnutrition, 43 (22.99%) and normal patients, 17 (9.09%).

Discussion

In this investigation it has been found that 170 (90.90%) of the bacterial skin infected children suffered different

degrees of malnutrition. The nutritional status of the studied population was very alarming comparing to other developing countries. In other developing countries it was found that the number of severely malnourished children hardly exceeded 3 percent²¹. In Bangladesh the percentage of severely malnourished children aged under five years reported to be 96.15%²². The findings were closer to the findings of the bacterial skin infected patients of the present study. In this study the number of male patients

were more than the female patients. Male to female ratio in Bangladesh was reported to be 52:48 in Bangladesh population Census report²³ and by other studies²². In this study it was found that most of the patients with malnutrition were in the age group 0-1 year. The findings were closely related to the findings of Black et al. where prevalence of impetigo was shown to be highest in the 6-23 months children. The data on the association of different degrees of malnutrition and bacterial aetiology from pyogenic skin infection was scanty.

Summary

The nutritional status of 187 bacterial skin infected patients of skin out-door department of Dhaka Shishu (Children) Hospital assessed by analysing the anthropometric data on weight and age. The data were used according to Gomez Classification to determine the nutritional status of the patients. All the study patients were children under five years and were selected randomly. Only 17 (9.09%) patients had normal weight for age and the rest 170 (90.90%) patients were suffering from different degrees of malnutrition. Among the malnourished children 61 (32.62%), 66 (35.29%) and 43 (22.99%) patients were suffering from first, second and third degree of malnutrition respectively. The percentage of malnourished children decreased with age.

Acknowledgement

The authors deeply acknowledge the cooperations made by the authority of Dhaka Shishu (Children) Hospital. We

also thank Dr. Kabirullah of BCSIR, Dhaka for his assistance during the preparation of this manuscript.

This result may be used as an useful guideline in the treatment of bacterial skin infected patients specially who attend different hospital. Where nutritional status of the patients also taken in consideration along with the necessary medication.

References

1. Greenwood, M. B. White, H. E. Immunology of medicine in the tropics. Edward Arnold. 1981. : 187.
2. Seoane, N.; Latham. M. C. Nutritional anthropometry in the identification of malnutrition in children. J. Trop. Pediat. 1971. : 17 : 98-104.
3. Mason, J. B. Haaga, J. S. Kenrich, C. Quinn, V. and Test, K. Estimates of child malnutrition in African countries. UNICEF social statistics / Cornell nutritional Surveillance Programme, Paper 1.1984.
4. Working paper : Regional workshop on nutrition surveillance for Asian countries, Bangkok, Thailand. Co-sponsored by UNICEF, East Asia and Pakistan. Regional office, Cornell Nutritional Surveillance Programme WHO, South East Asia Regional Office. Institute of Nutrition, Mahidol University. 1983.
5. Gueri, M. Gurney J. M. and Jutsun, P. The Gomez classification. Time for a change? Bull. WHO. 1980, 55 : 773-777.
6. Kabirullah, M. An annotated bibliography on nutritional research in Bangladesh. IFST. BCSIR, Dhaka, Bangladesh, 1989.
7. Black, R. E. ; Brown, K.H. ; Becker, S. ; Alim, A.R. M. A. and Huq, I. Longitudinal studies of infectious diseases and physical growth of children in rural Bangladesh. II. Incidence of diarrhoea and association with known pathogen. Am. J. Epidemiol. 1982. : 115 (3) : 315-324.
8. Bhuiya, A. ; Zimeki, M.A.S. and Souza, D. Socioeconomic differentials in child

- nutritional status and morbidity in a rural area of Bangladesh. *J. Trop. Pediatr.* 1986. : 32 (1): 17-23.
9. Neumann, C. G. ; Jelliffe, D. B. and Jrellife, E.F.P. Interaction of nutrition and infection. A factor important for African development. *Clin. Pediatr.* 17 (II) 1978. : 807-812.
 10. Mata, L. Urraitia, J.J.; Albertazzi, C.; Pellecer, O. and Arellano, E. Influence of recurrent infections on nutrition and growth of children in Guatemala. *Am. J. Clin. Nutr.* 25
 11. Katz, M. and Stiehm, E.R. Host defence in malnutrition. *Paediatrics.* 1977 : 59 : 490-495.
 12. Gordon, J.E. ; Miguel, M. D. ; guzman, A. ; Ascoli, W. ; Nevin, S. and Scrimshaw, S.. Acute diarrhoeal diseases in less developed countries : patterns of epidemiological behavior in Guatemalan villages..*Bull. WHO.* 1964 : 31 : 9-20.
 13. Palmer, D. L. ; Koster, F.T. ; Alam, A.K.M.J. and Islam, M.R. Nutritional status : a determinant of severity of diarrhoea in patients with cholera. *J. Infect. Dis.* 1976 : 134 (1) : 8-14.
 14. Tomes, C.G.A. *Medical Microbiology.* 4th edition. Baillere. Tendel, London. 1979 : 3.
 15. Khan, M. A. Study of bacterial causes and associated parameters of skin infection of children in Dhaka. M. Sc. thesis. Department of Microbiology. University of Dhaka. 1989.
 16. Selvaraj, R.J. and Bhat, R.S. Metabolic and bactericidal activities of leucocytes in protein-caloric malnutrition. *Am. J. Clin. Nutr.* 1972 : 25 : 166-174.
 17. Montefiore, D.G. ; Alausa, K.O. and Tomari, O. *Medicine in the tropics.* Tropical Microbiology. Churchill Livingstone, 1984 : 66.
 18. Jelliffe, D.B. The assessment of nutritional status of the community (with special reference to field surveys in developing regions of the world). WHO Monograph. Series. 1966 : 53: 3-271.
 19. Monica, C. *Tropical Microbiology.* Voll. -II. ELBS. England, 1984.
 20. Gomez, F. R. ; Gawan, R.R. ; Frenk, S. ; Craviota, R. ; Chaves, R. and Vasquez. Mortality in second and third degree malnutrition. *J. Trop. Pediatr.* c1956 : 2 : 77-83.
 21. Bengoa, J.M. *WHO Chronicle.* 1970 : 24 : 552-561.
 22. Ahmad, K. and Hassan, N.: Nutritional survey of rural Bangladesh. Institute of Nutrition and Food science. University of Dhaka, Bangladesh. 1983 : 104-114.
 23. Bangladesh Bureau of Statistics. Bangladesh Census Report, 1974.