

Original research article

Study Of Prevalence Of Protein Energy Malnourishment In Children Of 1 To 5 Years Age

¹Dr. Hemalatha Addi , ^{2*} Dr. Yalla Thirumal Reddy , ³Dr. Naveen Gandla

^{1,2} Assistant Professor, Dept. of Paediatrics, RIMS Adilabad, TS.

³ Senior Resident , Dept. of Paediatrics, RIMS Adilabad, TS.

Corresponding author: Dr. Yalla Thirumal Reddy

Email : yallathirumalreddy@gmail.com

Abstract

Malnutrition is the major health burden in developing countries. Protein energy malnutrition is the underlying cause for child morbidity and mortality. Under-nutrition continues to be a major public health problem in developing countries and various factors are involved in determining the nutritional status of the children. Objectives of this study was to assess the prevalence of protein energy malnutrition (PEM) among children (1-5 years) . 150 Children of age group 1 to 5 years, both male and female were included in study. Nutritional status of the children in less than five years were expressed by weight for age. Weight for age classification of Indian Academy of Pediatrics (IAP) and GOMEZ was calculated. 38.66 % children were normal. 25.33% had Grade 3 malnutrition. 26.66 % had Grade 2 malnutrition,9.33% had Grade 1 malnutrition. PEM is a critical problem with many determinants playing a role in causing this vicious cycle of undernutrition.

Key words : Protein Energy Malnourishment , 1 to 5 age group, Children

Introduction

Nearly one in five children under age five in the developing world is underweight (MDG report, 2012)[1] and it continues to be a primary cause of ill health and mortality among children. The World Health Organization (WHO) has reported hunger and related malnutrition as the greatest single threat to the world's public health. One in every three malnourished children of the world lives in India [2] and under-nutrition is a major cause in more than half of under-five deaths [3] . A wise investment in child's health, nutrition and education is the foundation stone for development of country as whole. Child population is most important section of society [4] and their growth and development is strong reflection on the future of a country. [5] The infants and pre-school children are most vulnerable to vicious cycle of malnutrition particularly under-nutrition. [6] Malnutrition, a silent emergency [7] prevents children from reaching their full physical and mental potential consequently [8] leading to delay in physical growth and motor development lower intellectual quotient, behavioral problems and deficient social skills. [9] According to World Health Organization, protein energy malnutrition (PEM) refers to "an imbalance between the supply of protein and energy and the body's demand for them to ensure optimal growth and

function".[10] It is a major public health problem in India. It affects particularly the preschool children (<5 years) with its dire consequences ranging from physical to cognitive growth and susceptibility to infection. This affects the child at the most crucial period of time of development which can lead to permanent impairment in later life.[11,12] PEM is measured in terms of underweight (low weight for age), stunting (low height for age) and wasting (low weight for height). The prevalence of stunting among under five is 48% (moderate and severe) and wasting is 20% (moderate and severe) and with an underweight prevalence of 43% (moderate and severe),[13] it is the highest in the world. The majority of children suffering from undernutrition (80%) are the mild and the moderate forms which go unnoticed and the early ages are affected more which makes the process irreversible. Undernutrition makes the child susceptible to infection and complements its effect in contributing to child mortality. This accounts for 22% of the burden of disease in India and adversely affects the economic growth of the country with an estimated adult productivity loss of 1.4% of gross domestic product (GDP). [14]

Protein–Energy Malnutrition [PEM] is also defined by measurements that fall below 2 Standard Deviations under the normal weight for age (Underweight), height for age (Stunting) and weight for height (Wasting) Severe malnutrition, typified by wasting, edema or both, occurs almost exclusively in children. Marasmus is defined as severe wasting. Marasmic kwashiorkor is defined as severe wasting in the presence of edema and Kwashiorkor as malnutrition with edema . Various etiological factors such as poverty, unhygienic environments, dietetic habits, customs and beliefs are well known to cause nutritional deficient states, morbidity and mortality. These factors vary from place to place and contribution made by each, ultimately sums up to affect the overall health status of preschool children in a country. Illness is frequently a consequence of malnutrition and malnutrition is also commonly the result of illness. Aim of this study is to Study of Prevalence of Protein Energy Malnourishment in children of 1 to 5 years age.

Material and Method

This study was conducted in Department of Paediatrics , RIMS Adilabad. Children coming to OPD were included in study . 150 Children of age group 1 to 5 years, both male and female were included in study. Nutritional status of the children in less than five years were expressed by weight for age. Weight for age classification of Indian Academy of pediatrics (IAP) and GOMEZ was calculated. Data was collected using preformed questionnaire, which includes general information, anthropometry and sociodemographic factors. Voluntary consent form was prepared in English, and local language and consent was taken from parents or family head. The age of child was confirmed either by parents or as per birth certificate. An anthropometric measurement like weight, was recorded with minimum clothes, using weighing machine, the height was recorded by the non-stretchable measuring tape. Gomez classification is based on Weight for age . In this system the normal reference child is the 50th centile of the Boston standard. Classification of stage of malnutrition is shown in Figure 1.

Strength of Gomez classification :

1. Based on 2 simple parameters age and weight.
2. Simple and easy parameters to measure.
3. Easy to understand and interpret.

Limitations of Gomez classification.

1. It assumes all children of of particular age will have same weight.
2. It may be misleading in acute malnutrtion.
3. Cut off point of 90% of reference is high.

Data was entered in the MS Excel 2007 and analysis was done.

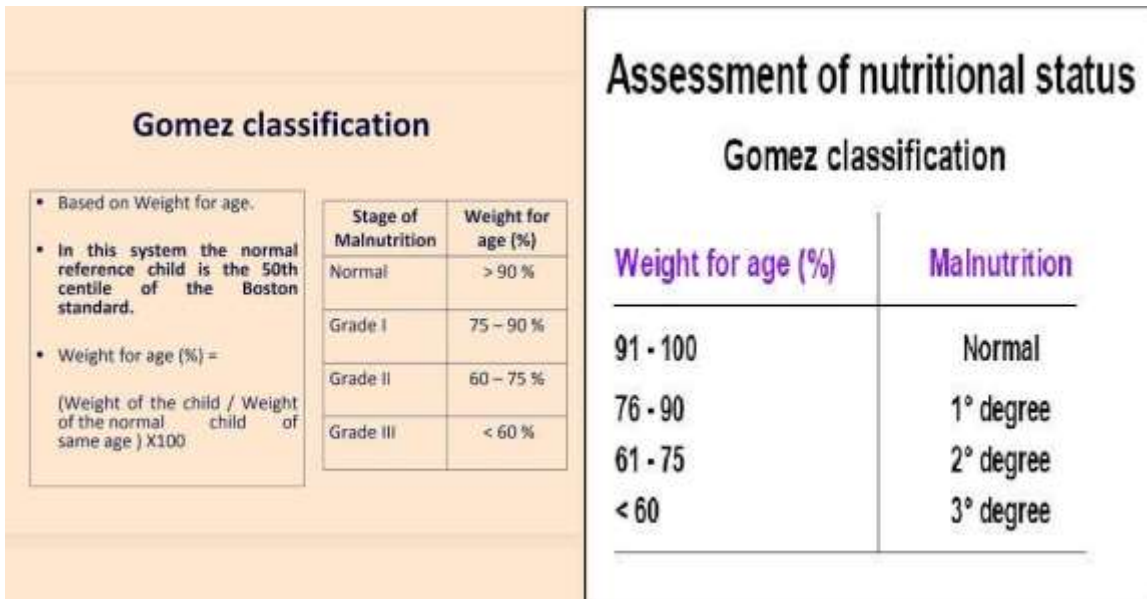


Figure 1: Gomez classification of degree of malnourishment.

Results

Table 1 shows age and gender wise distribution of children. 80 children were males and 70 were female children.

Table 1 : Age and Gender wise distribution of children of 1 to 5 years

Age groups	Gender - Males	Gender – Females	Total
1 years	15	12	27
1-2 years	18	16	34
2-3 years	12	15	27
3-4 years	10	17	27
4-5 years	25	10	35
Total	N = 80	N =70	150

Table 2 : Prevalence of PEM among children of 1 to 5 years

Degree of Malnutrition	Frequency	Percentage
75-90 % Grade-1	14	9.33 %
60-75 % Grade-2	40	26.66 %
<60 % Grade-3	38	25.33 %
>90 % normal	58	38.66 %
Total	150	100 %

Table 2 shows prevalence of degree of malnutrition on basis of Gomez classification. 38.66 % children were normal. 25.33% had Grade 3 malnutrition. 26.66 % had Grade 2 malnutrition,9.33% had Grade 1 malnutrition.

Discussion

Children are valuable human assets. It is the state's responsibility to protect the rights of the children and provide equitable chance to them for development. In India, the scheme of Integrated Child Development Scheme (ICDS) is considered the single largest program to provide the basic services to children from the deprived section of society. It aims at a better start in life by providing nutrition, health education and care during illness and many other services. In India, children living in the backward and draught – urban slums and those belonging to the socially backward groups are highly susceptible to malnutrition. Nutritional deficiencies are widely prevalent in India in the rural areas, particularly among the poor families. We might have come across in our day – to – life is read in popular publication about nutritional disorders occurring due to either deficiency of macronutrients e.g.-energy and proteins or micronutrients like vitamin A and B-complex. Human beings require balance diet to live, thrive and survive to carryout various activities. Any imbalance or inadequacy in food and nutrients could cause ill health, lead to nutritional disorders and even cause death. Nutritional status of children is an indicator of nutritional profile of the entire community. Protein - energy malnutrition affects children the most because they have less protein intake. The most common co-morbidities are diarrhoea. However, a variety of other conditions have been observed with PEM, including severe anaemia, bronchopneumonia, tuberculosis rickets, and keratomalacia. These co-morbidities tax already malnourished children and may prolong hospital stays initially for PEM and may increase the likelihood of death. Protein-energy malnutrition affects more than a third of the world's children. Nearly 80% of affected children live in Asia, 15% in Africa, and only about 5% in Latin America. Most countries in Asia have high or very high prevalence of underweight, stunting and wasting, the prevalence being far higher in Southern Asia. South-eastern Asia ranks second in the descending order of prevalence of underweight and third for wasting and stunting.[15]

In our study 38.66 % children were normal. 25.33% had Grade 3 malnutrition. 26.66 % had Grade 2 malnutrition,9.33% had Grade 1 malnutrition according to Gomez classification.Child malnutrition is a common nutritional problem that widely occurs in developing countries including India. Multipronged and multisectorial initiatives can be effective to tackle malnutrition. Actions like agricultural and dietary interventions, provision

of safe drinking water and sanitation, nutrition education, special attention to gender issues and vulnerable groups such as pregnant women and young children and quality health services are need of the hour to combat malnutrition at national level. [16,17] Nutrition education and diet based strategies are most effective approach to contain malnutrition.

[18,19] Moreover health care sector should address the problems related to early diagnosis, quick treatment and management and follow up prevent malnutrition among children in India.

Conclusion

About 61 % children of age group 1 to 5 years had malnutrition. Malnutrition is a silent killer. Early and timely detection of malnutrition is the key for its management. An intervention to prevent malnutrition includes promotion of breast-feeding exclusively for six months and further complemented with weaning or supplementary foods. Micronutrient deficiencies should be addressed through food based strategies such as dietary diversification through home gardens and small livestock and fortification of weaning or supplementary foods with micronutrient mixes. Promoting nutrition programmes targeting women and children can also help to combat menace of malnutrition. Control and prevention of malnutrition among children requires nutrition and health intervention and education and partnership between physician and dietitian.

References

1. Millennium Development Goals (MDG) report 2012. Available at: <http://www.un.org/millenniumgoals/reports.shtml>
2. UNICEF India. The Children - Nutrition. Available at: http://www.unicef.org/india/children_2356.htm
3. Levels & trends in Child Mortality report 2011. Estimates developed by the UN inter-agency group for child mortality estimation. Available http://www.unicef.org/media/files/Child_Mortality_Report_2011_Final.pdf
4. Gulati, J. 2010. Child Malnutrition: trends and issues. *Anthropologist*.12:131-40.
5. Schofield, C. and Ashworth, A. 1996. Why have mortality rates for severe malnutrition remained so high? *Bull World Health Organ*.74:223-29.
6. Isanaka, S., Nombela, N., Djibo, A., Poupard, M., Beckhoven, D., Gaboulaud, V., Guerin, P.J. and Grais, R.F.2009. Effect of preventive supplementation with ready-to-use therapeutic food on the nutritional status, mortality and morbidity of children aged 6 to 60 months in Niger. *JAMA*.301:277-85.
7. Padmadas, S.S., Hutter, I., and Willekens, F.2002. Weaning initiation patterns and subsequent linear growth progression among children aged 2-4 years in India. *International Journal of Epidemiology*.31:855-863.
8. Bhutia, D. 2014. Protein energy malnutrition in India: the plight of our under five children. *J Family Med Prim Care*.3:63-7.
9. Black, R., Morris, S. and Jennifer, B. 2003. Where and why are 10 million children dying every year? *The Lancet*.361:2226-234.
10. Onis MD, Blossner M. WHO global database on child growth and malnutrition.

- WHO, 1997. Available from: http://whqlibdoc.who.int/hq/1997/WHO_NUT_97.4.pdf. [Last retrieved on 2010 Oct 01].
11. Gragnolati M, Shekar M, Gupta MD, Bredenkamp C, Lee YK. India's Undernourished Children: A Call for Reform and Action. Washington, DC: World Bank; 2005.
 12. Park K. Nutrition and health. In: Parks Textbook of Preventive and Social Medicine. 19th ed. Jabalpur: Banarsidas Bhanot; 2007. p. 507.
 13. UNICEF. The state of the world's children. Adolescence: Children with disabilities, 2013. Available from: <http://www.unicef.org/sowc2011/>. [Last retrieved on 2013 Aug 10].
 14. Bhutia DT. Protein energy malnutrition in India: The plight of our under five children. *J Fam Med Primary Care* 2014;3:63-7.
 15. Onis M, Monteiro C, Akre J, Clugston G. The worldwide magnitude of protein-energy malnutrition: an overview from the WHO Global Database on Child Growth. *Bulletin of the World Health Organization*.1993;71(5): 703-12.
 16. Penny, M.E., Creed Kanashiro, H.M., Robert, R.C., Narro, M.R., Caulfield, L.E. and Black, R.E. 2005. Effectiveness of an educational intervention delivered through the health services to improve nutrition in young children: a cluster randomised controlled trial. *The Lancet*.365:1863- 872.
 17. Begin, F., Santizo, M.C., Peerson, J.M., Torun, B. and Brown, K.H. 2008. Effects of bovine serum concentrate, with or without supplemental micronutrients, on the growth, morbidity, and micronutrient status of young children in a lowincome, periurban Guatemalan community. *Eur J Clin Nutr*.62:39–50.
 18. Anstead, G.M., Chandrasekar, B., Zhao, W., Yang, J., Perez, L.E. and Melby, P.C. 2001. Malnutrition alters the innate immune response and increases early visceralization following *Leishmania donovani* infection. *Infect Immun*.69: 4709-718.
 19. Sengupta, P., Philip, N. and Benjamin, A. Epidemiological correlates of undernutrition in under-5 years children in an urban slum of Ludhiana. *Health and Population: Perspectives and Issues*. 33:1-9.