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Assessment of nutritional status of under five children attending outpatient department at a tertiary care hospital in North India

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Abstract

The nutrition status is always neglected issue of public health. The study was done to assess the nutritional status of children attending pediatric OPD at tertiary level hospital by anthropometric measurements and to know the health status of these children and their relation with nutritional status. The nutritional profile of children of age group 0-5 years attending Paediatric OPD was studied. Total 1000 under five children were equally divided into the age groups 0-12 months, 1-2 years, 2-3 years, 3-4 years and 4-5 years. A total of 40.1%, 45.2%, 16.3% of children had underweight, stunted and wasting, respectively. Total malnutrition prevalence was 63.1%. As per MUAC, 48.9% children were having mild to moderate malnutrition whereas 1.8% children had severe malnutrition. Malnutrition was more prevalent in girls and in 1-5 years age group children and was found statistically significant. Reduction of malnutrition can be ensured by availability of supplementary feeds and immunization.

Keywords: Malnutrition, mid-upper-arm-circumference, wasting, stunting

Introduction

Nearly one in five children in the developing world is underweight^[1] and it continues to be a primary cause of ill health and mortality among children. India has the highest under five mortality rate (43 per 1000 live births) which contributes to 25% of 6.9 million (the year 2013) under-five death worldwide^[1]. Most of these under-five deaths are due to acute respiratory diseases, diarrhea, malaria, measles, HIV/AIDS, and neonatal conditions contributing 44% of under-five deaths^[2].

Malnutrition is a silent emergency^[3]. It is frequently part of a vicious cycle that includes poverty and disease. These three factors are interlinked in such a way that each contributes to the presence and permanence of the others. Nutritional deficiencies affect long term physical growth and development and may lead to high level of illness and disability in adult life. Moreover, high prevalence of malnutrition jeopardizes future economic growth by reducing the intellectual and physical potential of entire population^[4]. Socioeconomic and political changes that improve health and nutrition can break the cycle; as can specific nutrition and health interventions^[5].

A child may get affected several times in a year; the incidence increases with the aggravation of a state of malnutrition^[6]. The three main indicators used to define under nutrition, i.e., underweight, stunting, and wasting, represent different histories of nutritional insult to the child. Occurring primarily in the first 2-3 years of life, linear growth retardation (stunting) is frequently associated with repeated exposure to adverse economic conditions, poor sanitation, and the interactive effects of poor energy and nutrient intakes and infection. Low weight-for age indicates a history of poor health or nutritional insult to the child, including recurrent illness and/or starvation, while a low weight-for-height is an indicator of wasting (i.e., thinness) and is generally associated with recent illness and failure to gain weight or a loss of weight^[7].

Mid-upper-arm circumference (MUAC) is being used as an alternative index of nutritional status for children during famines or refugee crises and as an additional screening tool in non-emergencies, and is based on a single cut-off value for all the children less than five years of age^[8]. Deaths in children constitute more than 34% of total deaths in India^[9]. Seven out of ten of these deaths are due to respiratory infections, diarrhea and malnutrition. There is high under five morbidity and mortality in India^[10].

Protein energy malnutrition is major contributory factor in majority of these childhood morbidities and mortalities. At present, 65% under five children are under weight which includes 47% moderate and 18 % severe cases of malnutrition^[11].

The present study was planned to assess the nutritional status of children attending pediatric OPD by anthropometric measurements and to know the health status of these children and their relation with nutritional status.

Material and methods

It was a hospital based study conducted over a period of 4 months from September 2018 to March 2019 at tertiary level Medical College in North India. Children visiting OPD for vaccination were excluded. Under five year children with a sample size of 1000 was taken for study. To get representation of each age group as nutrition and nutritional status vary with age, it was decided to study each group 0-12 months, 1-2 years, 2-3 years, 3-4 years and 4-5 years. Pre-tested structured questionnaire, which included nutrition, health complaints, and immunization history, was used. Anthropometric measurements (weight, height, mid-upper-arm circumference) were carried out following standard methods.

WHO growth charts was used for the assessment of malnutrition. Based on the age, weight and height, several indices such as height for age, weight for age and weight for height have been suggested. The children are classified using three categories: 'underweight' (low weight-for-age), 'stunting' (low height-for-age) or 'wasting' (low weight-

for-height).

Results

In the present study, females were found to be more malnourished when compared to males. We found that 40.1%, 45.2%, 16.3% of children were underweight, stunted and wasted, respectively [Table 1].

A child who was underweight, stunted or wasted was considered to be malnourished which comes out to be 631 (63.1%). Malnutrition prevalence was highest in 3-4 years age group and was lowest during infancy.

On comparing malnutrition in infancy with 1-5 years age group, better nutritional status was found in former group. The difference was statistically significant ($p < 0.05$) [Table 2].

It was observed [Table 3] that percentage of malnutrition was higher among children having acute respiratory infection (74.8%) followed by diarrhea (70.8%), measles (66.6%), and other illness (45.1%). However, it was statistically not significant when children with illness among malnourished were compared to children with illness who are not malnourished ($p = 0.18$).

Nutritional status of children aged 6-60 months was also measured using MUAC [Table 4]. There are total 978 children aged 6-60 months. As per MUAC, 48.9% children were having mild to moderate malnutrition whereas 1.8% children had severe malnutrition. Immunization status was also assessed. Fully immunized children were 67.8% whereas 31.7% children were partially immunized [figure 1].

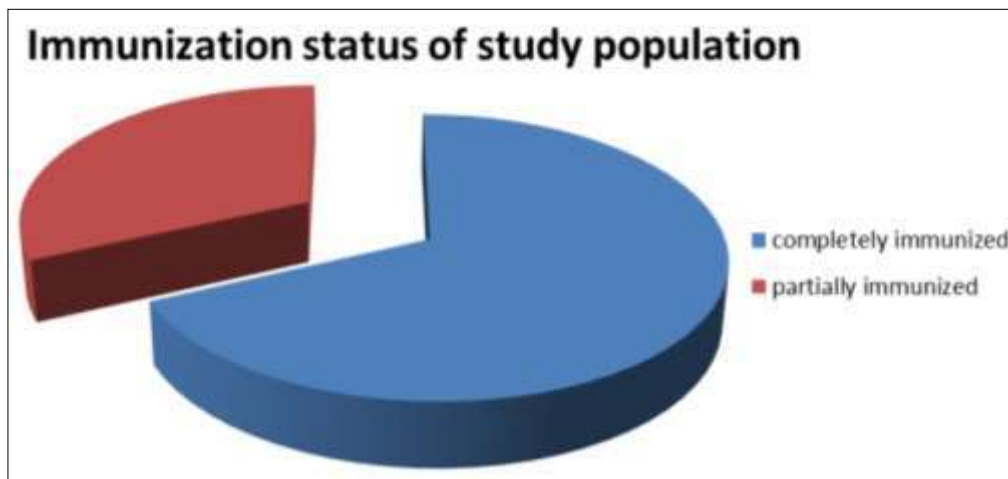


Fig 1: immunization status of study population. [Immunization status was considered as per age of children].

Table 1: Distribution of malnutrition indices in study population

Indicators	Boys (%)	Girls (%)	Total (N= 1000)
Underweight	189 (47.1)	212 (52.9)	401 (40.1)
Stunting	198 (43.8)	254 (56.2)	452 (45.2)
Wasting	79 (48.5)	84 (51.5)	163 (16.3)

Table 2: Distribution of children according to age and nutritional status

Age	Malnutrition (%)	Normal (%)
0-12 months	113 (56.5)	87 (43.5)
1-2 years	122 (61)	78 (39)
2-3 years	129 (64.5)	71 (35.5)
3-4 years	134 (67)	66 (33)
4-5 years	133 (66.5)	67 (33.5)
Total	631 (63.1)	369 (36.9)

Table 3: Association of major morbidities and Nutritional Status

Illness	Nutritional status (%)		Total (%)
	Malnutrition (%)	Normal (%)	
ARI	339 (74.8)	114 (25.2)	453 (45.3)
Diarrhoea	148 (70.8)	61 (29.2)	209 (20.9)
Measles	4 (66.6)	2 (33.3)	6 (0.6)
Others	151 (45.1)	199 (54.9)	350 (35.0)
Total	631 (63.1)	369 (36.9)	1000 (100)

Table 4: Distribution according to Mid Upper Arm Circumference (MUAC) of Children aged 6-60 months

MUAC	Total (%)	Interpretation
> 135 mm	481 (49.2)	Normal
115-135 mm	479 (48.9)	Mild to moderate malnutrition
< 115 mm	18 (1.8)	Severe malnutrition

Discussion

Protein calorie malnutrition is a widespread nutritional disease in developing countries. Preschool (under five) children are notoriously fraught with the risk of malnutrition and the prevalence of malnutrition varies between 50-80%^[5]. Almost two-third (63.1%) of the children in our study were suffering from protein energy malnutrition. Similar finding was observed by Gandhi *et al.*^[12], Gupta *et al.* (66.4%)^[5], and Rajput *et al.* (79%)^[13].

The percentage of malnutrition was significantly higher in 1-5 year age group. Similar finding was observed by Gupta *et al.*^[5, 14]. Improper weaning, recurrent infections make this age group more vulnerable.

In our study prevalence of underweight, wasting and stunting was 40.1%, 16.3% and 45.2%, respectively giving total prevalence of malnutrition to be 63.1%, which is lower than studies of Sengupta P^[15] (74% stunted, 42% wasted and 29.5% underweight), Rao VG^[16] underweight (61.6%), stunting (51.6%) and wasting (32.9%) and Singh^[17] underweight [53.86%], wasting [60.67%] and [43.22%] respectively.

No statistically significant difference ($p > 0.05$) was found in the prevalence of malnutrition in relation to the sex of the children as also reported by Chirmulay *et al.*^[18] NFHS III- (2005-06) also showed no significant difference in prevalence of underweight among boys and girls^[4].

We have also assessed nutritional status of children aged 6-60 months using MUAC. The benefit of using MUAC is that it is easy to use and identify the high risk children who need urgent treatment.

In the present study, we have not explored socio-demographic, maternal factors and other environmental factors which probably also play a significant role in childhood malnutrition.

Conclusion

Majority of under five children were malnourished (63.1%) and among them 40.1% children were underweight, 45.2% children were stunted and 16.3% were wasted. Here malnutrition was more common in females than males.

Recommendations

Reduction of malnutrition in 0-5 age group can be ensured by availability of supplementary feed.

Healthcare providers to focus on health education among parents, especially the mothers on the exact nutritional requirements in terms of quality and quantity of the child at specific age groups.

Limitations

Study was conducted among children having health complaints attending Out Patient Department so their nutritional status may not be accurately comparable with healthy children of community.

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