ASSESSMENT OF NUTRITIONAL STATUS AND MORBIDITY PROFILE IN CHILDREN ATTENDING A TERTIARY CARE HOSPITAL OF SUB-HIMALAYAN REGION - A CROSS-SECTIONAL STUDY

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ABSTRACT

BACKGROUND

Child under-nutrition is an internationally recognised important public health problem. Malnutrition is a silent emergency and the diseases associated represent the tip of iceberg. Most serious victim to this is children under 5 year of age.

Objective: To assess nutritional status and morbidity profile in children attending paediatrics out-patient department at a tertiary medical college hospital of Sub Himalayan region.

MATERIALS AND METHODS

A hospital based cross-sectional study at Dr Rajendra Prasad Government Medical College Hospital, Tanda, Himachal Pradesh was performed for two months. Study was conducted in a case study mode using convenient sampling technique. A total of 350 children were assessed from 1 month to 5 years of age. Data was collected regarding age, sex, anthropometric measurements (height and weight) and clinical profile from study participants. The assessment of malnutrition was done using Waterlow's classification.

RESULTS

Less than half of the study subjects attending the tertiary care centre was nutritionally normal (43%). One third of them were wasted (34%) and around one fifth stunted. The male children were brought more for consultation (68%). Boys suffered more than girls in all three indicators though it was not statistically significant. Majority of consultation was sought for acute respiratory illnesses (ARI) and fever.

CONCLUSION

Majority of the diseases were presented by underweight children. But these were the tip of the iceberg. The scenario may be worse for those not presenting with symptoms.

KEYWORDS

Malnutrition, Morbidity, Children.


BACKGROUND

Nutritional status is a key indicator of poverty and hunger, poor health, and inadequate education and social conditions. Poorly nourished children cannot grow and develop properly, resist infections or learn to their full potential. Maltreated adults are less capable of performing work and are severely disadvantaged in terms of their social and economic security. According to 2005-06 National family health survey, 20% of children less than five years were wasted, 48% were stunted and 43% of children were underweight in India. According to District level household survey-4 (2012-13), the prevalence of underweight among children less than 5 years was 28.5%, 21.6 % wasted and 32.4% stunted in Himachal Pradesh.

Nutritional status of children and determinants of child malnutrition should be periodically studied to monitor the situation and it is important to give appropriate intervention to prevent malnutrition. National level surveys are conducted at long intervals, hence periodic reporting from peripheral level done by integrated child development scheme at Anganwadis also provide a picture of nutrition status. But these are also subjected to reporter bias, hence independent surveys can be helpful.

Keeping this in mind the study was planned to assess the nutritional status and morbidity profile of infants, children and adolescents attending the paediatric outpatient department of a tertiary care centre situated in rural areas of sub-Himalayan region.

MATERIALS AND METHODS

This institution based observational study was conducted in a case study mode using systematic random sampling at the outpatient department. It was conducted during the interdepartmental posting of residents of Community Medicine in Paediatrics department of a tertiary care centre of Himachal Pradesh for the duration of two months, in July-August 2015.

Using the prevalence of underweight according to DLHS-4 as 28.5%, the minimum sample size was calculated to be 316 which was rounded off to 350.

The daily paediatric OPD attendance of children and adolescents was in the range of 150-200. The resident attended the OPD thrice weekly for two months. So for 24 days
about 3600-4800 children were expected to attend the OPD and 10% of these were recruited for the study. Every 10th child of age less than 5 years was included in the study. Data was collected regarding age, sex, anthropometric measurements (Height and weight) and clinical profile from study participants.

For the measurement of weight, the child and adolescent was asked to step up backwards onto the scale and stand still over the centre of the scale with body weight evenly distributed between both feet. The child's arms were hanging freely by the sides of the body with palms facing the thighs. The child was asked to hold his/her head up, and face forward. Weight was recorded to the nearest 100 grams using the recommended scale with a digital readout. For the measurement of standing height, a stature meter was used. The child was asked to stand with his/her back against the board. The back, scapulae and buttocks were in contact with the vertical board. The child was instructed to stand erect (stand up straight and look straight ahead). The child's position was verified from both the FRONT and from the LEFT side of the body. Next, the child's head was positioned in the Frankfort Horizontal Plane. Next, a moveable headpiece was brought onto the upper most (superior) point on the head with sufficient pressure to compress the hair. The measurement was recorded to the nearest 0.1 cm. For a child less than 2 years, length was measured. The investigators asked to lay the child on his back with his head against the fixed headboard, compressing the hair. The head was asked to be placed in such a way that an imaginary vertical line from the ear canal to the lower border of the eye socket is perpendicular to the board (The child’s eyes looking straight up). The mother was asked to move behind the headboard and hold the head in this position. Shoulders were made to touch the board, and the spine was not allowed to arch.

The median weight for age, height for age and weight for height of the NCHS (National Centre for Health and Statistics) standard was used as a reference anthropometric indicator in the study. Waterlow's classification of nutritional status based on height for age and weight for age was used to categorize the children for malnutrition. The classification has been described in Table 1.

RESULTS

The mean age of the 350 children included in the study was 32.9±18.6 months. More than two third of the participants were males. Around 43% of those who attended the OPD were of age group 1-3 years and 39% from age group 3-5 years. Majority of children were brought to hospital for acute respiratory illnesses (27.1%). Around 16.9% presented with pyrexia and 13.1% with malnutrition. Seizures also contributed to 5% of attendance and diarrhoea to 8% (Table 2).

On classifying the participants for their nutritional status according to Waterlow’s classification, it was observed that 34% were stunted, 18.3% wasted and 4.6% were both stunted and wasted. The weight for age was <90% in around 60% of children. More than half of both males and females were stunted or wasted or both. Higher proportions of males (36.6%) were stunted as compared to females (28.6%). One fifth of females (20.5%) were wasted as compared to 17% males. Higher proportions of males (62.2%) were underweight as compared to girls (51.8) (Table 3).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Nutritional Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight for height</td>
<td>&gt;80%</td>
<td>Normal</td>
</tr>
<tr>
<td>Height for age</td>
<td>&gt;90%</td>
<td>Normal</td>
</tr>
<tr>
<td>Weight for height</td>
<td>&gt;80%</td>
<td>Stunted</td>
</tr>
<tr>
<td>Height for age</td>
<td>&lt;90%</td>
<td>Wasted</td>
</tr>
<tr>
<td>Weight for height</td>
<td>&lt;80%</td>
<td>Wasted and stunted</td>
</tr>
<tr>
<td>Height for age</td>
<td>&lt;90%</td>
<td>Wasted and stunted</td>
</tr>
</tbody>
</table>

Table 1. Waterlow’s Classification

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number; Total=350</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>112</td>
<td>32</td>
</tr>
<tr>
<td>Male</td>
<td>238</td>
<td>68</td>
</tr>
</tbody>
</table>

Table 2. Demographic and Morbidity Profile of Children Attending Tertiary Care Centre

<table>
<thead>
<tr>
<th>Waterlow Classification</th>
<th>Total N (%)</th>
<th>Males N (%)</th>
<th>Females N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>151 (43.1)</td>
<td>104 (43.7)</td>
<td>47 (41.9)</td>
</tr>
<tr>
<td>Stunted</td>
<td>119 (34.0)</td>
<td>87 (36.6)</td>
<td>32 (28.6)</td>
</tr>
<tr>
<td>Wasted</td>
<td>64 (18.3)</td>
<td>41 (17.2)</td>
<td>23 (20.5)</td>
</tr>
<tr>
<td>Stunted and wasted</td>
<td>16 (4.6)</td>
<td>6 (2.5)</td>
<td>10 (8.9)</td>
</tr>
<tr>
<td>Total</td>
<td>350 (100)</td>
<td>238 (100)</td>
<td>112 (100)</td>
</tr>
</tbody>
</table>

Table 3. Nutritional Profile of Children Attending Tertiary Care Centre

DISCUSSION

According to NFHS-3 (2005-06), almost half of children under age five years in India (48 percent) are chronically malnourished. In other words, they are too short for their age or stunted. Current study gave a prevalence of 56.9%. A higher prevalence could be due to the study population being...
recruited from a tertiary care centre, where a majority of sick children are present. Stunting is a good long-term indicator of the nutritional status of a population because it does not vary appreciably by the season of data collection or other short-term factors, such as epidemic illnesses, acute food shortages, or shifts in economic conditions. Current study gave a prevalence of 36% and was higher among males than females. DLHS-4 data of Himachal Pradesh reports 32% prevalence of stunting. This was comparable to our study. Acute malnutrition, as evidenced by wasting, results in a child being too thin for his or her height. One out of every five children in India under five years is wasted according to NFHS-3 and almost same proportion (21.6%) of children in HP according to DLHS-4. Current analysis gave lower prevalence of around 18% which was higher among females. Forty-three percent of children under age five years in India and 28.5% in HP are underweight for their age. Underweight status is a composite index of chronic or acute malnutrition. Underweight is often used as a basic indicator of the status of a population’s health. This study gives a prevalence of around 59% due to difference in indicator use in our study (<90% weight for age) as compared to Z score used in above analysis. Moreover, these were the sick children attending the hospital who are more likely to be underweight. Globally, the prevalence of acute and chronic malnutrition showed a large diversity. In South Africa in 2007, stunting (18%), wasting (7%), and underweight (10%) were all prevalent for children aged less than 5 years. In 2005, South-central Asia was estimated to have the highest prevalence (16%) of wasting and numbers (29 million). The Eastern and middle Africans have the highest prevalence in estimates of stunting with 50% and 42% respectively; however, the largest number (74 million) of children affected by stunting lived in south central Asia.

According to DLHS-4, prevalence of both diarrhoea and ARI in last 2 weeks for children less than 5 years was around 4.5%. In the current analysis, around 8% of children with diarrhoea attended OPD. The reason could be the seasonal diarrhoea as the data was collected during rainy season. Also, more than one fourth of OPD attendance was attributed to ARI, which was very high as compared to district level survey. Majority of this ARI comprised of asthma and pneumonia patients. Majority of asthma patients visited for follow-up. Diarrhoea and Upper Respiratory Tract Infections were the most common morbidities reported in the age group of 1-5 years in urban slums of Uttar Pradesh. A study from rural West Bengal, it was found that ARI was the most frequent morbidity (38.6%) present in under five followed by undernutrition (27.7%) and diarrhoea (12.8%). Our study reported ARI and Pyrexia of unknown origin as most common morbidity followed by protein-energy malnutrition. Worm infestation was included in others category. In the current study, male children with diarrhoea, ARI and PEM were more commonly attending OPD as compared to females. Our findings were similar to a study conducted in rural area of Dehradun and are in contrast to a study in Ahmedabad and at Delhi slum where majority of the females were either suffering from or have a history of one or more illnesses within the previous two weeks. An overall 5.5 percent risk of long-term major respiratory sequelae from childhood pneumonia in non-hospitalised children has been reported, with a threefold higher risk in hospitalised children.

Recent estimates of diarrhoeal disease burden show that the highest number of annual episodes were recorded in the African and South East Asia regions. An important consequence of persistently high rates of diarrhoea morbidity is a negative effect on child growth and development. Incidence of both pneumonia and diarrhoea are closely associated with poor home environments, undernutrition, and lack of access to health services. A child’s environment and activities while growing shape its cognitive abilities and general development. Optimal child development is a result of adequate nutrition, prevention, and timely management of illness, care, and stimulation. Malnourished, sick, and disabled children are at a particular risk of poor development. Effective interventions that impact on child development are available along the life course and should be utilised.

REFERENCES