

To Compare Anthropometric Parameters between Control Group and Malnourished Preschool Children

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Abstract: This study was undertaken with the aim of evaluating the nutritional status and associated nutritional deficiencies of malnourished pre-school children (1-5 Years) in relation to anthropometric measurements. A total of 400 pre-school children were evaluated. All the individuals were grouped into 3 groups according to their anthropometric parameters. The anthropometric measurements and if any associated nutritional deficiencies were evaluated and compared amongst the three groups, made on the basis of presence of malnutrition and malnutrition associated with nutritional deficiencies. The present work “A cross sectional study on nutritional status and associated nutritional deficiencies in malnourished preschool children in relation to anthropometric measurements” About 400 children in the age group of 1-5 years were studied for their Anthropometric indices. Age being the only criteria the anthropometric measurements was done to assess the nutritional status. Age was recorded by interviewing the parents or by the birth record of the child. Growth pattern of children were worked out for boys and girls separately, in respect of different body measurements were compared with international and national standards. The current study demonstrates the anthropometric parameters in association with nutritional deficiencies with rising level of malnutrition across the various study groups. All the anthropometric measurements were lower in malnourished children In comparison to their normal counterpart children. Boys had marginally better anthropometric measurements than girls.

Study Design: Cross-Sectional Study.

Keywords: Anthropometric Parameters, Malnourished, Preschool, Control.

INTRODUCTION

A number of studies carried out during emergency and non-emergency situations have demonstrated the association between increased mortality and increasing severity of anthropometric deficits [1, 2].

There is strong evidence that poor growth or small size is associated with impaired development, and a number of studies have also demonstrated a relationship between growth status and school performance and intellectual achievement. However, this cannot be regarded as a simple causal relationship because of the complex environmental or socioeconomic factors that affect both growth and development [3, 4].

The present study is carried out to find out the pattern of malnutrition in 1-5 years children and dietary factors, so that actions may be taken in future to control malnutrition in community.

The present work “A cross sectional study on nutritional status and associated nutritional deficiencies in malnourished preschool children in relation to anthropometric measurements” was carried out at Amaltas Institute of Medical Sciences, Dewas (M.P.) between Jan 2016 to June 2017, a cross sectional study was conducted amongst children attending both indoor and outdoor of Paediatrics Department. About 400 children in the age group of 1-5 years were studied for their Anthropometric indices. Age being the only criteria the anthropometric measurements was done to assess the nutritional status. Age was recorded by interviewing the parents or by the birth record of the child. Growth pattern of children were worked out for boys and girls separately, in respect of different body measurements were compared with international and national standards.

Inclusion Criteria

- All children aged 1 to 5 years attending at Amaltas Hospital.

MATERIALS & METHODS

- All children 1 to 5 years of nearby areas of Amaltas Hospital
- Subjects who are having one or more WHO recommended signs of malnutrition.
- Subjects who are having any of the signs of vitamins deficiency

Exclusion Criteria

- Nonconsenting parents.
- Subjects with diagnosed congenital disorders.
- Subjects with diagnosed major illness.

Methodology (Material & Methods) Materials (Tools)

For Anthropometric measurement

- Electronic weighing machine
- WHO recommended measuring tape
- Infantometer / stadiometer

To assess the nutritional status and causative etiologic factors of acute malnutrition in children- Questionnaire

Methodology

- Complete nutritional status and clinical status will be done using the questionnaire and clinical examination. Anthropometric measurement using the anthropometric tools.

Measurements were taken using standardized methods

Height was measured for children (24-60 months). The child was made to stand on the measuring board which was kept vertical. Shoulder blades and buttocks of the child were placed against the board. With the right hand, the head piece on top of the child's head was lowered down and pushed through the child's hair. Once the position was achieved the measurement was made to the nearest 0.1 cm.

Weight was measured after minimizing clothing on the child using standard electronic weighing machine. After the value was stable for about 3 seconds, the weight of the child was recorded.

Head Circumference

Head circumference was measured by a fibreglass tape passing firmly over the supra-orbital ridge in front and that part of the occiput which gave the maximum diameter. The

child head was made steady by holding at the side and neck [8]. It was recorded nearest to 0.1 cm.

Interpretation of nutritional indices

Anthropometric indices can be interpreted as follows: i) Weight-for-height Index: used to compare a child's weight with the expected value of a normal (NCHS/WHO reference) child of the same height. Low weight-for-height is a measure of Wasting. ii) Height-for-age Index: used to compare a child's height with the expected value of a normal (NCHS/WHO reference) child of the same age from a reference population. Low height-for-age is a measure of Stunting. iii) Weight-for-age Index: used to compare a child's weight with the expected value of a normal (NCHS/WHO reference) child of the same age. Low weight-for-age is a measure of underweight. iv) Low weight-for-height (Wasting or thinness): indicates in most cases a recent and severe process of weight loss, which is often associated with acute starvation and/or severe disease. However, wasting may also be the result of a chronic unfavorable condition. Provided there is no severe food shortage. v) Low height-for-age (Stunted growth): reflects a process of failure to reach linear growth potential as a result of suboptimal health and/or nutritional conditions. vi) Low weight-for-age (underweight): is influenced by both the height of the child (height-for-age) and weight (weight-for-height). vii) mid upper arm circumference is a good predictor of immediate risk of death. It is used for rapid screening of acute malnutrition.

The anthropometric data in present study were compared with the National Growth Data and with the international NCHS standard data. Literacy status of mother was recorded. Nutritional status was graded according to Z-score classification and I.A.P classification. The reference standard used was National Centre of Health Statistics (NCHS) for Z score classification and Harvard Standard for I.A.P. classification. In this study Z-score were calculated for all three indices, weight-for-age (underweight), height-for-age (stunting) and weight-for-height (wasting) by using NCHS reference standard.

RESULTS & OBSERVATIONS

Table-1: Comparison of anthropometric parameter (Head circumference) between Normal studied group and Malnourished Group in all age groups

Age in Years	Normal group		Malnourished group		P-value
	Boys	Girls	Boys	Girls	
1-2	44.2±1.2	44.1±1.3	43.2±0.66	42.7±0.3	0.00
2-3	46.3±1.7	45.8±0.6	45.50±0.8	44.6±0.70	0.00

3-4	47.5±1.8	47.1±1.01	46.4±0.9	45.3±0.90	0.00
4-5	48.5±0.6	48.1±2.1	47.0±0.80	46.0±0.70	0.05

This table shows the Head circumference in different ages of pre-school malnourished children and normal group. There was significant lower value of

all measurements than their normal counterpart children (P<0.05).

Table-2: Comparison of anthropometric parameter (Weight) between Normal studied group and malnourished group in all age groups

Age in Years	Normal group		Malnourished group		P-value
	Boys	Girls	Boys	Girls	
1-2	8.2 ±1.7	7.6 ±1.6	7.3 ±1.0	7.2 ±0.5	0.00
2-3	9.9 ±1.82	9.2 ±1.5	8.6 ±1.3	8.4 ±1.0	0.05
3-4	12.2±1.7	10.8±1.8	10.7±1.8	10.3±1.7	0.00
4-5	14.4±2.2	14.2±1.6	13.7±1.5	13.3±1.3	0.001

This table shows the weight in different ages of pre-school malnourished children and normal group. There was significant lower value of all

measurements than their normal counterpart children (P<0.05).

Table-3: Comparison of anthropometric parameter (Height) Between Normal studied group and malnourished group in all age groups

Age in Years	Normal group		Malnourished group		P-value
	Boys	Girls	Boys	Girls	
1-2	72.6±3.39	72.4±3.9	71.6±4.5	70.5±5.1	0.00
2-3	79.3±4.6	79.9±3.3	78.8±3.5	76.6±4.9	0.00
3-4	90.6±3.81	89.1±4.08	86.1±4.1	86.8±3.8	0.05
4-5	103.9 ±4.21	94.3±3.75	92.4±4.6	92.1±4.2	0.00

This table shows the height in different ages of pre-school malnourished children and normal group. There was significant lower value of all measurements than their normal counterpart children (P<0.05).

recommended National Centre for Health Statistics (N.C.H.S.) data for reference standard. In our present study we found the prevalence of malnourishment to be 67.5% by IAP Classification and 68.7% by WHO Classification. Prevalence of undernutrition in girls by IAP Classification (51.8%) was more than boys (48.1%). A study by Bhupeshwari Patel, Dulari Gandhi also showed WHO classification classified 90% of children undernourished whereas IAP classification classified 80% of children as undernourished. According to WHO criteria 32% and in IAP criteria only 10% children were severely undernourished. When compared, this was a statistically significant (p=0.000) difference in malnutrition by these classifications. In our study among girls the highest prevalence of undernutrition was seen in up to 3 years age group, whereas in boys the maximum prevalence was seen in 1-2 years age group.

DISCUSSION

Nutritional anthropometry is concerned with the measurement of variation of the physical dimension and gross composition of the human body at different age levels and is considered to be the best method for assessment of malnutrition. It has the advantage of being easy to perform, rousing no antagonism and requires only simple apparatus. Serious malnutrition is all around us and yet it is not obvious, for it exhibits the Iceberg phenomenon". By Anthropometric assessment one can detect the sub-clinical malnutrition very easily. Anthropometric measurements obtained in children are usually compared with that of a "reference standard". Though the data collected by Indian Council of Medical Research (I.C.M.R. in different parts of the country provide valuable information regarding community average for weight and height, these cannot be used as reference standard because these were not obtained on well fed children and hence do not reflect optimal growth (120). W.H.O. has now

CONCLUSION

The current study demonstrates the anthropometric parameters in association with nutritional deficiencies with rising level of malnutrition across the various study groups.

All the anthropometric measurements were lower in malnourished children. In comparison to their normal counterpart children, the boy had marginally better anthropometric measurements than girls.

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