Original Article

A study on malnutrition among children attending anganwadi centres by IAP and WHO classification

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Abstract

Introduction: Till end of 2006 Anganwadi centres used IAP classification for grading malnutrition. After 2007 it has been shifted to WHO classification. So it is important to assess whether using the later will lead to changes in the estimated prevalence of underweight. **Materials and Methods:** This was a cross sectional study conducted among 24 Anganwadi centres in a panchayath of Kottayam district. 140 children between 1-5 years of age were included in the study. Their height/ length and weight were recorded and classified according to WHO and IAP classification and these were compared statistically. **Results:** According to WHO criteria 61% and in IAP 56% of children were undernourished. 8 children who were considered normal by IAP classification were malnourished according to Z Score classification.13 children who were mild malnourished in IAP classification had severe malnutrition based on Z Score classification When compared, there was statistically significant ($p<0.05$) **Conclusion:** More widespread use of the Z-Score system is recommended for identifying all the facets of under nutrition. WHO classification detects more children with undernutrition but has drawback of classifying more of them in severe category as compared to IAP classification.

Keywords: WHO classification, IAP classification, Undernutrition.

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INTRODUCTION

Protein energy malnutrition (PEM) is a widespread problem in developing countries. About 60-70% of children with PEM suffer from mild to moderate type and 2-5% is of severe type.[1.] In any community, under-five children are one of the most vulnerable groups for nutritional deficiencies, owing to many factors ranging from Low Birth Weight to maternal ill health to socio-economic and environmental factors. The risk of death from common childhood diseases is doubled for a mildly malnourished child, tripled for a moderately malnourished child and eight times for a severely malnourished child.[2] The National Family Health Survey (NFHS) in India reported the prevalence of underweight among children younger than 3 years in 2005–2006 to be nearly 43%[3]. Estimates from the most recent national survey indicate that 6.4% of children below 60 months of age have weight for height below –3 SD i.e. Severe Acute Malnutrition (SAM). In India, the nationwide Integrated Child Development Services (ICDS) program uses the IAP criteria to grade malnutrition. Weight-for-age classifications (Gomez, I.A.P), Height-for-age and Weight-for-height classifications (McLaren, Waterlow's) are the most commonly used indices for measuring malnutrition. None of these classifications address all the three indices of under nutrition - Stunting, Wasting and Underweight. The three indices stunting, wasting and underweight reflect distinct biological processes and their use is necessary for determining appropriate interventions. Stunting (Low height-for-Age) is an indicator of chronic undernutrition due to prolonged food deprivation and/or illness; Wasting (Low weight for height) is an indicator of acute undernutrition, the result of more recent food deprivation and/or illness;

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Underweight (Low weight-for-age) is used as a composite measure to reflect both acute and chronic undernutrition, although it cannot distinguish between them[4] WHO classification for malnutrition considers standard deviation or Z scores for classifying children in moderate (between -2 to -3 SD) and severe (<-3SD) categories, whereas IAP Classification considers 0 SD or 50th percentile as 100 percent of expected weight for age and then grade I (70-80% of expected), grade II (60-70% of expected), grade III (50-60% of expected) and grade IV (<50% of expected) PEM (protein energy malnutrition)are classified. In these grade I and II are considered moderate while grade III and IV are considered severe malnutrition. In our study we aimed to compare WHO versus IAP classification for malnutrition in children below 5 years of age. In our study we aimed to compare WHO versus IAP classification for malnutrition in children below 3 years of age in anganwadi centres.

MATERIALS AND METHODS

A cross sectional study was conducted for a period of two months from 24 anganwadi centres of Arpookara panchayath, Kottayam.. The initial criteria was that all the children in the age group of 1 to 5 years (both male and female) enrolled and attending the AWCs were included in the study. Single stage cluster sampling method was used for the study considering each AWC as a cluster. There were around 24 anganwadi centres in Arpookara panchayat; Sample size was calculated as 120 based on prevalence of 43% undernutrition among under five age group in National Family Health Survey-3, at 95% confidence interval and β error of 20% with expected drop out of 10%[3]. Children in the age group of 1-5 years in all the anganwadi centres were examined for their height and weight status. Total of 140 children were examined. Permission from Kottayam CDPO was taken before starting the study. Anganawadi workers were informed about the visit one day before. The purpose of the study and procedure were explained to them. Data was collected by, clinical examination, anthropometry and individual health record maintained in the Anganwadi centres. Nutritional status of the children was assessed by clinical examination and anthropometric measurement like weight using Salter scale with a precision of 100g. Height was measured in children with accuracy of 0.5 cm. Height in centimeters was marked on the wall with the help of measuring tape. Children were made to stand bare feet with heels, back and occiput against the wall with Frankfurt plane being parallel to the ground. Anthropometric data were plotted separately on both WHO and IAP charts. socio demographic details about the parents were collected from the records in the anganwadi centre.

Statistical Analysis

Data was entered into Excel sheet for analysis. Chi square test and fisher exact test for categorical data was used as tests of significance. P<0.05 was considered as statistically significant for tests of significance. Data analysis was done using SPSS Version 16.

RESULTS

The mean age of study population was 3.1 years (SD=0.935). 66% of children were above 3 years of age.. Boys constituted around 57% and girls 43%. 68% of children were from low socio economic status. PEM was more among children below 3 years (p<0.02). 56% of malnourished child were from low SES (p<0.04). Prevalence of PEM was 56% based on IAP classification. Grade I malnutrition was 38% and Grade II malnutrition was 18%. Mild malnutrition was high in both classification (38% Vs 44%). 8 children who were categorized as normal in IAP classification were underweight in 'Z' score classification. According to IAP classification 62 (44%) children had normal weight for age, 53 (38%) had grade I PEM, 22 (16%) grade II PEM, 3 (2%) grade III PEM respectively. According to the WHO recommended classification the prevalence of protein energy malnutrition was around 61%. No children were observed with oedema, overweight or obesity in the present study. Based on Z score classification 44% were underweight {<-2SD} and 17%-severe underweight {<-3SD}. The proportion of severe underweight was more in boys. When we compared IAP classification with Z Score classification there was statistically significant difference in severity of undernutrition (p<0.05). Based on IAP classification 62 children were considered normal but according to Z score only 54 children were only in normal category. Similarly in IAP classification in grade I and II there were 75 children which is considered as mild and moderate malnutrition but according to Z Score only 62 children had mild malnutrition and the rest had severe malnutrition. 8 children who were considered normal by IAP classification were malnourished according to Z Score classification.13 children who were mild malnourished in IAP classification had severe malnutrition based on Z Score classification. Over all undernutrition was diagnosed more by Z Score classification (total 61%) than IAP classification (total 56%). IAP classification diagnosed more children in grade I and II PEM (moderate undernutrition) and WHO classification detected more number of severe undernutrition.

DISCUSSION

According to the WHO recommended classification the prevalence of stunting (low height for age) and wasting

(low weight for height) was 48 (34.2%), 86 (61%) respectively in our study. No children were observed with oedema, overweight or obesity in the present study. According to NNMB report 2006 the overall prevalence of stunting (Height for age <Median –2SD) was observed to be 45%, while that of severe stunting (Height for age <Median –3SD) was 20%[5]. In our study stunting was comparatively low with only 34.2%. The overall prevalence of wasting (Weight for Height <Median – 2SD) was observed to be 44%, while that of severe wasting (Weight for Height <Median – 3SD) was 17%. But in our study wasting was more than this with 26% and none with severe wasting. The overall prevalence of grade III and IV undernutrition among 6-60 months children was about 4%. It ranged from a low 1.3% in the State of Kerala, through 2-3% in Andhra Pradesh, Tamil Nadu, Maharashtra and West Bengal to a high 8% in Gujarat. In our study it was around 2% which is close to the above value. A study by N Seetharamanatal, Only 31.4% of the children studied were normal; 68.6% were undernourished. 48.4% were stunted (20.3% severely) and 20.2% were wasted (6.9% severely[6] A study carried out on nutritional status of 1286 pre-school children selected by a stratified random sampling and residing in urban, rural and slum areas of Chandigarh was assessed by weight for age criteria by making domiciliary visits[7]. The overall prevalence of protein energy malnutrition (PEM) was found to be 51.6% while 65.4%, 26.3%, 5.3% and 3% of children had grades I, II, II and IV PEM, respectively. The prevalence of PEM was significantly higher among Integrated Child Development Service (ICDS) beneficiaries (53.8%) than non-ICDS beneficiaries (46.9%)[8]. A study conducted among the Onge tribe of the Andaman and Nicobar Islands with the objectives of assessing their nutritional status showed mild to moderate degree of malnutrition to 85% of children of pre-school age and severe malnutrition in 10%.Similar study was conducted in Vadodara, Gujarat revealed 90% and 80% as undernourished by WHO and IAP classification. According to WHO criteria 32% and in IAP criteria only 10% children were severely undernourished. There was significant difference when we compared IAP classification with WHO classification. The overall number of undernourished children (61% by WHO and 56% by IAP classification) as well as number of severely undernourished children (17% by WHO and 2% by IAP classification) were higher by WHO classification and number of moderately undernourished (grade I and II) was higher with IAP classification (44% by WHO and 54% by IAP classification). According to a study done by Shankar Prinjaatali, the prevalence of underweight in the first 6 months of life was nearly 1.6 times higher when calculated with WHO Child Growth Standards compared with IAP growth curves[9]. For children of all ages combined, the prevalence of underweight was higher when IAP standards rather than the new WHO standards were used, but it was found that overall estimates for severe malnutrition were higher using the new WHO standards rather than IAP standards ($P < 0.001$). This pattern was repeated within each age stratum and for both sexes, which is comparable to our study. Whereas, as per IAP criteria, 54% were undernourished and 2% were severely undernourished. Using Underweight (low weight-for- age) as the only criterion for identifying undernourished children (as done in the Integrated Child Development Services currently) may underestimate the true prevalence of undernutrition, by as much as 21.9%. these results were similar to our study[10].

Table 1: Age and sex distribution of the study population

AGE GROUP (in years)	Boys		Girls		Total
	Number	%	Number	%	
1 – 2	8	53.33	7	46.7	15 (100%)
2 – 3	18	56.25	14	43.75	32 (100%)
3 – 4	28	58.33	20	41.77	48 (100%)
4 – 5	26	57.77	19	42.23	45 (100%)
Total	**80**	**57**	**60**	**43**	**140 (100%)**

Table 2: Distribution of malnutrition based on IAP and Z score classification

Iap Classification	Normal		Grade I		Grade Ii		Grade Iii	
	62	44%	53	38%	22	16%	3	2%
			Mild malnutrition(<-2SD)		Severe malnutrition <-3SD			
Z SCORE	54	39%	62	44%	24		17%	

Chi square :15.89 p=0.0001

Table 3: Distribution of malnutrition based on sex distribution

	Male	Female	Total
Normal	32(59%)	22(41%)	54(100%)
Malnourished	48(55.8%)	38(44.2%)	86(100%)

Table 4: Distribution of malnutrition based on age distribution

Age Group (in years)	Normal		Malnourished		Total
	Number	%	Number	%	
1 – 2	5	33.33	10	66.67	15 (100%)
2 – 3	4	12.5	28	87.5	32 (100%)
3 – 4	26	54.2	22	45.8	48 (100%)
4 – 5	19	42.3	26	57.7	45 (100%)
Total	**54**	**39**	**86**	**61**	**140 (100%)**

Chi square-8.66 P Value= 0.02

CONCLUSION

Over all undernutrition is diagnosed more by WHO classification was 61% than IAP classification which is 56%. IAP classification diagnosed more children in grade I and II PEM and WHO classification detected more number of severe under nutrition. This indicates that WHO classification is more sensitive in detecting under nutriton but it has drawback of classifying more children in severe under nutrition.

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