

Original Research Article

Composite index of anthropometric failure among under 5 children attending the Immunoprophylaxis clinic in a tertiary care hospital in Nagpur, Maharashtra, India

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ABSTRACT

Background: Under nutrition is a global public health problem. There are numerous methods of assessment of malnutrition among which CIAF is the most recent, relatively robust since it envisages all the parameters for estimation of nutritional status of the children. So, this study was conducted to find the rates of composite index of anthropometric failure in the children attending the Immunoprophylaxis clinic in a tertiary care hospital of Nagpur and to find associations with the socio demographic variables.

Methods: This descriptive cross-sectional study was conducted at the Immunoprophylaxis clinic of a tertiary care institute in Nagpur from September 2016 to January 2017. The study subjects were the children attending the OPD of Immunoprophylaxis clinic of a tertiary care hospital. Necessary permissions were taken before the start of the study. Data was collected using pretested and pre-designed questionnaire. Height and weight were measured using standard guidelines and categorized into groups of CIAF as described by Nandy et al.

Results: A total of 460 study subjects were enrolled in the study. The mean age group of the study subjects was 2.47 ± 1.56 years. According to the grades of CIAF, 48.51% were having no failure. Age and gender were factors which were associated with failure status by CIAF.

Conclusions: We found high rates of anthropometric failure in our study. The age groups less than 3 years had higher odds of being in failure when compared to more than 3 years age. Further, males had higher odds of being into failure when compared to females. Community based studies are recommended.

Keywords: Anthropometry, Child Health, CIAF, Malnutrition

INTRODUCTION

Under nutrition is a global public health problem.¹⁻³ Traditionally, many researchers have classified under nutrition using their own methods. Some of them are weight for age, weight for height, height for age, mid arm circumference, calf circumference etc.⁴⁻⁶ But, among these all one disadvantage is common that they reflect only one part of under nutrition. Weight for age reflects

only the children having acute and chronic under nutrition, stunting gives an idea about chronic under nutrition and weight for height gives insight over acute under nutrition. Underweight is not summation of the children with stunting (chronic) and wasting (acute). So, we might miss out some cases of under nutrition if only one indicator is considered. There are numerous methods of assessment of malnutrition among which CIAF is the most recent, relatively robust since it envisages all the

parameters for estimation of nutritional status of the children. Svedberg et al first designed a concept of Composite Index of Anthropometric Failure for assessing multiple outcomes of under nutrition.⁷ Later, Nandy S et al used this classification on National Family Health Survey-2 in India giving more insight over the burden of under nutrition.⁸ Many studies have used this concept in adding up the knowledge of composite index of anthropometric failure in their geographical locations.⁸⁻²⁴ This study will add to the pool of such studies with an objective to study the rates of composite index of anthropometric failure in the children attending the Immunoprophylaxis clinic in a tertiary care hospital of Nagpur and to find associations with the socio demographic variables.

METHODS

This descriptive cross-sectional study was conducted at the Immunoprophylaxis clinic of a tertiary care institute in Nagpur from September 2016 to January 2017. The study subjects were the children attending the outpatient Department of Immuno Prophylaxis Clinic of Department of Community Medicine. Those children who had chronic illness and whose mothers did not give consent were excluded from the study. The sampling of children was done on convenience sampling. Written informed consent was taken from the mothers attending the clinic along with the children. The purpose and nature of the study was explained to the parents and interview technique was used to collect the data. Ethical committee approval was sought before the start of the study.

A study conducted by Dhok R et al done in urban slums of Nagpur concluded that the prevalence of composite index of anthropometric failure was 58.59%.²³ Using this prevalence, with 95% confidence interval and 5% absolute precision the sample size we found was 373. Anticipating a non-response rate of 20%, the final minimum sample size was found to be 448. A case record form consisted of socio demographic variables like age, gender, socio economic status, educational status of the mother and religion. The age was calculated based on their date of birth in the mother and child card. The socio economic status of the family was calculated using the B G Prasad scale appropriate for the current consumer price index.²⁵ The educational status of the mother was classified using the Indian classification of education standards.²⁶ Height or length and weight were measured according to standard guidelines.²⁷ Further, these were classified using the Z score tables of World Health Organisation into stunting, wasting and underweight.²⁸ Composite index of anthropometric failure was classified into 7 categories. These were Grade A (no wasting, no stunting and no underweight), Grade B (wasting only), Grade C (wasting and underweight), Grade D (wasting, underweight and stunting), Grade E (wasting and stunting), Grade F (wasting only) and Grade Y (underweight only).⁸ The case record form was finalised by a team of experts from the department of community

medicine. A pilot study on 30 children was done for assessing the feasibility and to test the proforma. After making necessary changes, the final data collection was done. The children requiring having severe stunting, wasting and underweight status were sent for further evaluation to the outpatient Department of Paediatrics of the same institute.

Statistical analysis

The data was collected, compiled and analysed using EPI Info version 7.2. The qualitative data was expressed using percentages. The quantitative data was expressed using mean and standard deviations. To find the difference between two proportions we used chi square/fisher's exact test. The strength of association was expressed in terms of Odds ratio. All analysis was two tailed and the significance level was set at 0.05.

RESULTS

A total of 460 study subjects were enrolled after informed consent of mother or relative accompanied the child at Immunoprophylaxis clinic of tertiary care hospital.

Table 1: Socio demographic characteristics of the study population subjects.

Socio demographic characteristics	Number	%
Age group (years)		
0-3	256	55.65
3-6	204	44.35
Gender		
Male	240	52.17
Female	220	47.83
Religion		
Hindu	363	78.91
Muslim	27	5.87
Sikh	12	2.60
Christian	4	0.86
Buddhist	54	11.73
Socio economic status^a		
Class 1	16	3.48
Class 2	100	21.47
Class 3	83	18.04
Class 4	168	36.52
Class 5	93	20.22
Educational status of mother		
Illiterate	33	7.17
Primary	6	1.30
Upper primary	66	14.35
Secondary	169	36.74
Senior secondary	113	24.75
Graduate and above	73	15.86

SD: Standard deviation; ^aaccording to BG Prasad classification

The mean age group of the study subjects was 2.47±1.56 years. Most of the study subjects males (52.17%), majority of study subjects belonged to Hindu religion

(78.91%), (36.74%) of the mothers were educated up to secondary and in the socio-economic class 4 (36.52%). From the total around half of study subjects (52.17%) were male and (47.83%) were female.

As per modified BG Prasad classification around half of the study subject belong to lower class 261 (class IV and class V).

According to the grades of composite index of anthropometric failure, 48.51% were having no failure. Further, 12.17% of the children had Grade C, 11.52% had Grade F, 10.43% had Grade B, 8.48% had Grade E, 5.87% had Grade Y and 2.61% had Grade D.

Table 2: Prevalence of composite index of anthropometric failure.

Composite index of anthropometric failure	Number	%
Grade A (No failure)	225	48.91
Grade B (wasting only)	48	10.43
Grade C (wasting and underweight)	56	12.17
Grade D (wasting, stunting and underweight)	12	2.61
Grade E (stunting and underweight)	39	8.48
Grade F (stunting only)	53	11.52
Grade Y (underweight only)	27	5.87

Table 3: Association of socio demographic variables with composite index of anthropometric failure.

Socio demographic characteristics	Failure, n = 235		No Failure, n = 225		Odds ratio (confidence interval)	P value
	Number	%	Number	%		
Age group (years)						
0-3	114	61.28	112	49.78	1.15 (1.10 to 2.31)	0.0130*
3-6	91	38.72	113	50.22		
Gender						
Male	124	52.77	96	42.67	1.50 (1.03 to 2.16)	0.0301*
Female	111	47.23	129	57.33		
Educational status of mother^a						
< Higher Secondary	141	60.00	133	59.11	1.03 (0.71 to 1.50)	0.8460
≥ Higher Secondary	94	40.00	92	40.89		
Socio economic status^a						
Lower (< Rs. 1666.67)	119	50.64	122	54.22	0.86 (0.60 to 1.24)	0.4416
Higher (≥ Rs. 1666.67)	116	49.36	103	45.78		
Religion						
Hindu	190	80.85	173	76.88	1.26 (0.81 to 1.98)	0.2977
Others	45	19.15	52	23.12		

a- Median value used

Table 3 depicts significant association between the age group and gender and composite index of anthropometric failure. The age group of 0 to 3 years (OR=1.15) and males (OR=1.50) significantly higher odds of being into failure. The educational status of mother, socio economic status of the family and religion were not significantly associated with Composite index of Anthropometric failure (p>0.05).

DISCUSSION

The sustainable development goals finalised in the year 2015 had a separate target under the goal “zero hunger” to end all types of malnutrition by the year 2025.²⁹ To achieve this, the first step is to study the magnitude of the problem. The present study focuses on studying the Prevalence rates of composite index of anthropometric failure among children less than 6 years attending the Immunoprophylaxis clinic of a tertiary care hospital in Nagpur.

Studies conducted by Biswas S et al, Shit S et al, Boregowda GS et al, Sen J et al, Solanki R et al, Goswami M et al, Dewan D et al, Mukhopadhyay DK et al, Daral S et al, Nandy S et al, Bose K et al and Dhok RS et al showed higher rates of composite index of anthropometric failure than compared to the present study.^{6,10-13,16-18,20,23-24} Further, some studies found similar rates compared to our study. Studies by Bejarano IF et al done in Argentina had very low rates of composite index of anthropometric failure when compared to the present study.³¹

Present study showed that 10.43% were having wasting, 11.52% were having stunting and 5.87% were underweight. Higher rates of stunting, wasting and underweight were reported by Patil CR et al, Dasgupta A et al, Savannur MS et al, Boregowda GS et al, Sen J et al, Solanki R et al, Goswami M et al, Dewan D et al, Nandy S et al, Keri VC et al and Bose K et al.^{6,9,11,12,16,18,19,21,22,24,32,}

Lower rates were reported by Dhok RS et al, Daral S et al and Acharya A et al.^{10,15,23} Almost similar rates were reported by Biswas S et al.¹³

In the present study, we found that the composite index of anthropometric failure rates was significantly higher in case of 0-3 years of age 61.28% as compared to 3 to 6 years of age. A study done by Dasgupta A et al showed similar results.⁹ The composite index of anthropometric failure rates was higher in males when compared to females in our study. But, studies done by Sen J et al, Acharya A et al, Solanki R et al, Daral S et al and Dhok RS et al did not find any significant difference between the two genders.^{15,16,10,18,23} We did not find any significant difference in the composite index of anthropometric failure rates among socio economic status and educational status of the mother. Studies done by Dasgupta A et al, Shit S et al, Dewan D et al, Khan RE et al, Daral S et al and Dhok RS et al showed a significantly higher rates in lower literacy status of the mother.^{9,10,14,17,23,24} Some studies done by Dhok RS et al, Daral S et al and Khan RE et al showed significantly higher rates of composite index of anthropometric failure in lower socio economic status families.^{10,14,23}

This study was a hospital based cross sectional study, which reflects only 'the tip of iceberg' of the under-nutrition status in the community. For assessment of nutritional status, only anthropometry was used but biochemical indicators would give more precise idea of the same. Apart of these limitations, there were some strength like a larger sample size and reflecting a bigger geographical picture of the disease under consideration.

CONCLUSION

Authors found that the rates of composite index of anthropometric failure were 51.79% which is higher than the conventional methods of classification. We also found the rates to be significantly higher in males and 0 to 3 years age group. So, we recommend that this indicator can be used for studying multiple outcomes of under nutrition in the community.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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