

Research Article

Anthropometric Assessment and Morbidity Profile of under Five Children Attending Immunization Clinic at Urban Health Centre

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Abstract: In large area of the world today, malnutrition, especially that affecting young children, is one of the principal public health problems. Anthropometry has become a practical tool for evaluating the nutritional status of populations, particularly of children in developing countries & the nutritional status is the best indicator of global well-being of children. Malnutrition, Poverty & Disease are interlinked in such a way that each contributes to the presence & permanence of the other. The objectives of the study were to assess malnutrition using anthropometric measurements & to study the socio- economic & demographic factors associated with it & to assess the morbidity profile of the study group. The present cross-sectional study was carried out over a period of 2 months in the Under 5 children attending immunization clinic at the Urban Health Centre (UHC) of GMC, Miraj. Information regarding socio- economic & demographic factors was collected using predesigned, pretested, proforma. Standard procedures were used for measuring weight & length/height of children & IAP classification was used for grading PEM. Overall prevalence of PEM was 56.23% in study population, with higher prevalence in male (57.1%) as compared to females (42.9%). Out of total 489 cases, Grade I PEM (25.6 %) was most common followed by grade II (20 %). Out of total, 30.3% children had some morbidity. Upper respiratory tract infection (21.6%) & diarrhoea (18.2%) were the most commonly reported morbidities. Special emphasis should be given for provision of health care services and promotion and protection of optimal infant feeding practices, proper child rearing, education on environmental sanitation and personal hygienic practices, for the improvement of nutritional as well as health status of the children.

Keywords: Under 5 children, Protein energy malnutrition, Anthropometry, Morbidity profile

INTRODUCTION

In large area of the world today, malnutrition, especially that affecting young children, is one of the principal public health problems [1]. Anthropometry has become a practical tool for evaluating the nutritional status of populations, particularly of children in developing countries & the nutritional status is the best indicator of global well being of children [2]. Malnutrition, Poverty & Disease are interlinked in such a way that each contributes to the presence & permanence of the other[3]. The major diseases affecting this age group are mostly acute diarrheal diseases, acute respiratory infections, anaemia, skin diseases, ear discharge etc[4]. Nutritional status of pre-school children is of paramount importance, since the foundation of lifetime health, strength and intellectual vitality is laid during that period [5]. Present study highlights magnitude of problem and some socioeconomic and demographic factors associated with malnutrition among under five children.

Aim & Objectives

- To assess malnutrition using anthropometric measurements & to study the socio- economic & demographic factors associated with it.
- To assess the morbidity profile of the study group.

MATERIALS AND METHODS

The present cross-sectional study was carried out over a period of 3 months from July to September 2012, in the Under 5 children attending immunization clinic at the Urban Health Centre of Govt. Medical College, Miraj. Total 489 children were examined during the study period. After taking verbal consent from the parents accompanying children information regarding age, sex, education & occupation of parents, religion, birth order, type of family, total family members and morbidity etc. was collected using predesigned, pretested, semi-structured proforma. Standard procedures were used for measuring weight &

length/height of children [8-11]. Weight of the children was recorded by using electronic weighing machine with minimum clothing to the nearest 0.1 kg. Height was measured by asking children to stand barefoot by facing the back adjacent to the wall and keeping the scale on their head. A point was marked by pencil on the wall and the children were asked to move away and the height was measured using non stretchable measuring tape. Children less than one year were made to lie down on a flat surface in supine position with their back & thigh touching the surface and toe facing upward. A mark was made at the head end and at toe

end and children were removed. The length between two marks was measured using measuring tape. Length/height was measured to the nearest accuracy 0.1cm. For morbidity data, enquiry was made about history of any morbidity in previous two weeks or at the time of examination. On an average 10 min. were spent for collecting information from each respondent.

Statistical Analysis

All data was entered in MS office excel software & Percentages & Chi-square test were applied

RESULTS

Table 1: Demographic characteristics of study subjects

Variables	Grades of PEM According To IAP classification																
	Grade I		Grade II		Grade III		Grade IV		Total PEM		Normal		Total				
	No	%	No	%	No	%	No	%	No	%	No	%	No	%			
Age (Months)																	χ ² =23 d.f.=12 P<0.05 S
0-12	63	50.4	45	45.9	18	60	4	18.2	130	47.3	103	48.1	233	47.6			
13-24	23	18.4	25	25.5	1	3.3	8	36.4	57	20.7	21	9.8	78	16			
25-36	14	11.2	14	14.3	3	10	5	22.7	36	13.1	32	15	68	13.9			
37-48	8	6.4	4	4.1	5	16.7	3	13.6	20	7.3	27	12.6	47	9.6			
49-60	17	13.6	10	10.2	3	10	2	9.1	32	11.6	31	14.5	63	12.9			
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100			
Gender																	
Male	71	56.8	65	66.3	13	43.3	8	36.4	157	57.1	105	49.1	262	53.6	χ ² =9.5914 d.f.=3 P<0.05 S		
Female	54	43.2	33	33.7	17	56.7	14	63.6	118	42.9	109	50.9	227	46.4			
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100			
Literacy of Mother																	
< Sec.	76	60.8	56	57.1	21	70	16	72.7	169	61.5	97	45.3	266	54.4	χ ² =10.173 d.f.=3 P<0.05S		
> sec.	49	39.2	42	42.9	9	30	6	27.3	106	38.5	117	54.7	223	45.6			
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100			
Age of Mother At Child Birth																	
<20	13	10.4	19	19.4	7	23.3	5	22.7	44	16	64	29.9	108	22.1	χ ² =11.667 P>0.05 df=6 NS		
20-25	80	64	50	51	12	40	8	36.4	150	54.5	93	43.5	243	49.7			
>25	32	25.6	29	29.6	11	36.7	9	40.9	81	29.5	57	26.6	138	28.2			
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100			

S: Significant association NS: Non significant

In the present study total 489 under 5 children were examined, and there anthropometric measurements and morbidity profile was studied. 47.6 % children were in the age group of 0-12 months. Overall prevalence of PEM was 56.3%, prevalence of PEM was highest among the infants (47.3%). Amongst all cases of PEM, Grade I PEM was most common (45.5%) followed by grade II(35.6%). Grade I, II & III PEM was most common in 0-12 month age group but Grade IV PEM was most common in the 13-24 month age group. Significant association was seen between the

grade of PEM & age of the child (χ²=23,d.f. =12, p<0.05, S).

Malnutrition is more common in male child (57.1%) as compared to female child (42.9%). Grade I (56.8%) & II (66.3%) PEM was more common in male child and Grade III (56.7%) & IV (63.6%) PEM was more common in female child. There is a significant association between grades of malnutrition & sex of the child (χ² =9.59, d. f. = 3, p<0.05, S).

Significant association was seen between the prevalence of malnutrition& literacy status of mother.

Prevalence of malnutrition was 61.5% in the children of the mother who were studied up to 10th std. & 38.5% in the mother who were studied > 10th std. ($\chi^2=10.17$, d.f.=3, $p<0.05$). Malnutrition in children was most common when age of mother at child birth was 20-25

years (54.5%) followed by >25 age group (29.5%). Statistically significant association was not seen between the age of mother at child birth & PEM ($\chi^2=11.667$, $p>0.05$, d.f.=6, NS).

Table 2: Association between Social factors & PEM cases

Variables	Grades of PEM According To IAP classification														
	Grade I		Grade II		Grade III		Grade IV		Total PEM		Normal		Total		
Birth order	No	%	No	%	No	%	No	%	No	%	No	%	No	%	$\chi^2=63.859$ d.f.=3 $P<0.05$ S
1	5	4	11	11.2	6	20	4	18.2	26	9.5	91	42.5	117	23.9	
2	11	8.8	42	42.9	9	30	9	40.9	71	25.8	78	36.4	149	30.5	
≥ 3	109	87.2	45	45.9	15	50	9	40.9	178	64.7	45	21.1	223	45.6	
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100	
Religion															
Hindu	71	56.8	44	44.9	8	26.7	2	9.1	125	45.5	99	46.3	224	45.8	$\chi^2=25.112$ d.f.=6 $P<0.001$, HS
Muslim	29	23.2	30	30.6	10	33.3	8	36.4	77	28	67	31.3	144	29.5	
Other	25	20	24	24.5	12	40	12	54.5	73	26.5	48	22.4	121	24.7	
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100	
Family size															
03 to 05	56	44.8	44	44.9	7	23.3	5	22.7	112	40.7	117	54.7	229	44.8	$\chi^2=8.27$ d.f.=3 $P<0.05$, S
06 to 10	69	55.2	54	55.1	23	76.7	17	77.3	163	59.3	97	45.3	260	53.2	
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100	
Type of Family															
Nuclear	60	48	42	42.9	12	40	6	27.3	120	43.6	127	59.3	247	50.5	$\chi^2=74.12$ d.f.=3 $P<0.001$ HS
Joint	65	52	56	57.1	18	60	16	72.7	155	56.4	87	40.7	242	49.5	
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100	

HS: Highly Significant

There is significant relation between birth order & grade of PEM ($\chi^2=63.85$, d.f.=3 $p<0.05$, S). PEM increases as birth order increases. Grade I PEM was most common when birth order was ≥ 3 (87.2%). Overall prevalence of PEM was more in Hindu religion (45.5%) followed by Muslim (28%). Grade IV PEM was most common in other religion i.e. Boudhist & Christian (54.5%) followed by Muslim (36.4%) & this association was statistically significant ($\chi^2=25.11$, d.f.=6, $p<0.001$, HS).

Family size observed in the present study was quite high. More than half 260 (53.2%) of the children belong to the family size of 6-10 & out of this population 163 (62.7%) children were malnourished.

Severity of malnutrition increases as the family size increases. All grades of malnutrition were higher in higher family size, especially grade III & IV PEM increases significantly with family size. Significant association was seen between family size & severity of malnutrition ($\chi^2=8.27$, d.f. =3, $p<0.05$, S).

Almost equal no. of participants belonged to joint & nuclear family, but prevalence of PEM was found to be much more in joint family (56.4%). Highly significant association was seen between the grades of PEM & type of family ($\chi^2=74.12$, d.f.=3, $p<0.001$, HS). Highest no. of Grade IV PEM cases were found in the joint family (72.7%).

Table 3: Relationship between Socio-economic status & Malnutrition

Variable	Grades of PEM According To IAP classification													
	Grade I		Grade II		Grade III		Grade IV		Total PEM		Normal		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Middle	7	5.6	11	11.2	10	33.3	4	18.2	32	11.6	53	24.8	85	17.4
U- L	19	15.2	48	49	4	13.4	11	50	82	29.8	116	54.2	198	40.5
Lower	99	79.2	39	39.8	16	53.3	7	31.8	161	58.6	45	21	206	42.1
Total	125	100	98	100	30	100	22	100	275	100	214	100	489	100

$\chi^2=61.425$
d.f.= 6
P<0.05 S

Malnutrition & SE status goes hand in hand. PEM is more prevalent in lower social class (58.6%). Grade II & IV PEM was more prevalent in Upper lower class & Grade I & III is more prevalent in lower SE class but

overall prevalence of PEM was more in lower class (58.6%). There is significant association between SE status & PEM($\chi^2=61.42, d.f. = 6, p<0.05, S$).

Table 4: Morbidity pattern of the study group

Morbid condition	Male		Female		Total	
	No.	%	No.	%	No.	%
No Morbidity	175	66.8	166	73.1	341	69.7
Fever	9	3.4	5	2.2	14	2.9
Diarrhoea	15	5.7	12	5.3	27	5.5
URTI	18	6.9	14	6.2	32	6.5
LRTI	9	3.4	6	2.6	15	3.06
Skin Infections	12	4.6	9	4	21	4.3
Clinical Anaemia	7	2.7	6	2.6	13	2.7
H/O Convulsions	3	1.1	2	0.9	5	1.02
Worms in stool	9	3.4	4	1.8	13	2.7
Stomatitis/Cheilosis	5	1.9	3	1.3	8	1.6
Total	262	100	227	100	489	100

$\chi^2=2.3127$
df=1
P>0.1NS

χ^2 test was applied after clubbing the table of morbidity & no morbidity.

Out of total 489 children studied, 341(69.7%) children do not have any type of morbidity while 148 (30.3%) children have some kind of morbidity. Out of total morbidities, Upper respiratory tract infection (21.6%) & Diarrhea (18.2%) were the most commonly reported morbidities. Other morbidities were fever, LRTI, Skin infections, anemia, H/O passing worms in stool etc. Association between gender of the study population & morbidity was not significant ($\chi^2=2.31, d.f.=1, p>0.1, NS$).

DISCUSSION

The study provides anthropometric data on the nutritional status of children attending immunization clinic at the Urban Health Centre of Govt. Medical College Miraj. Nutritional status is an integral component of the overall health of an individual and provides an indicator of the well-being of children. In this regard, the importance of the nutritional status of children in the developing countries should be

emphasized, not only for the improvement of health of children in the coming generation, but also for the overall development of the concerned region in near future [12-13].

Majority (56.3%) of the children in our study were suffering from PEM. In our study it was found that Malnutrition is more common in male child (57.1%) as compared to female child (42.9%), similar to the study by M.K. Goelet *al.*[6] in which 63.2% males & 36.8% Females were having PEM. This is in contrast to the studies of Ahmed *et al.* [5] & in study by Subhash S Avachat [7] in which prevalence of malnutrition in males was 54.2% & in females 58.6% & in males 47.4% & in females 54.3% respectively. Grade I (56.8%) & II (66.3%) PEM was more common in male child and Grade III (56.7%) & IV (63.6%) PEM was more common in female child.

A larger proportion of females were suffering from III and IV grade malnutrition as compared to males. In a study conducted in Aligarh by other author, it was found that most females were suffering from PEM as compared to males [14]. Similar study done in Hissar District [15] shows that grade I PEM was more common in boys than girls but grade II and III PEM was significantly more in girls than boys ($p < 0.01$). In another study conducted in urban slum of Delhi [16], it was found that there was significant difference among male and female with respect to malnutrition with more females (9.6%) suffering from severe malnutrition as compared to male (6.5%).

Similar to other studies [5, 6], significant association was seen between the prevalence of malnutrition & literacy status of mother. All grades of malnutrition were higher in higher family size, especially grade III & IV PEM increases significantly with increase in family size.

REFERENCES

1. Jelliffe DB; The assessment of the nutritional status of the community. Monograph series no.53, World Health Organization, Geneva 1966; 1-25.
2. Goon DT, Toriola AL, Shaw BS, Amusa LO, Monyeki MA, Akinyemi O *et al.*; Anthropometrically determined nutritional status of urban primary school children in Makurdi, Nigeria. BMC Public Health; 2011, 11:769.
3. Narkhede V, Sinha U, Bhardwaj SD, Pitale S; Morbidity Profile in Under Five Children in Urban Slum Area of Nagpur. Natl J Community Med., 2012; 3(3):442-446.
4. Srivastava DK, Jain P, Kumar S, Gour N, Bansal M; Morbidity profile of under five children in urban slum area of Etawah District. Indian Journal of Community Health, 2012; 24(2): 153-157.
5. Ahmad E, Khalil S; Khan Z; Nutritional status in children (1-5 yrs): A Rural Study. Indian Journal of Community Health, 2011; 23(2): 84-86.
6. Goel MK, Mishra R, Gaur D, Das A; Nutrition Surveillance in 1-6 Years Old Children in Urban Slums of A City in Northern India. The Internet J of Epidemiology, 2007; 5(1). Available From <http://ispub.com/IJE/5/1/8737>.
7. Avachat SS, Phalke VD, Phalke DB; Epidemiological study of malnutrition (under nutrition) among under five children in a section of rural area. Pravara Med Rev., 2009; 1(2):20-22.
8. Biswas T, Mandal PK, Biswas S; Assessment of Health, Nutrition and Immunisation status amongst under -5 children in migratory brick kiln population of periurban Kolkata, India. Sudanese Journal of Public Health, 2011; 6(1): 7-13.
9. Chiabi A, Tchokoteu PF, Takou V, Fru F, Tchouine F; Anthropometric measurements of children attending a vaccination clinic in Yaounde, Cameroon. African Health Sciences, 2008; 8(3): 174-179.
10. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z *et al.*; 2000 CDC growth charts for the United States: Methods and development. National Center for Health Statistics. Vital Health Stat., 2002; 11(246): 1-190.
11. Som S, Pal M, Bharati P; Role of individual and household level factors on stunting: a comparative study in three Indian states. Ann Hum Biol., 2007; 34(6): 632-646.
12. Dutta A, Pant K, Puthia R, Sah A; Prevalence of undernutrition among children in the Garhwal Himalayas. Food and Nutr Bull., 2009; 30(1): 77-81.
13. Rao VG, Yadav R, Dolla CK, Kumar S, Bhondeley MK, Ukey M; Undernutrition and childhood morbidities among tribal preschool children. Indian J Med Res., 2005; 122(1): 43-47.
14. Sharma AK; An Epidemiological Study of Protein Calorie Malnutrition in Preschool Children at RHTC, Jawan, Aligarh. Thesis submitted to JNMC for Degree of M.D. (PSM), 1977.
15. Bhat CM, Dahiya S; Nutritional status of preschool children in Gangawa Village of Hissar district. Ind J Nutr Dietet., 1985; 22(7): 206-214.
16. Kapur D, Sharma S, Agarawal N; Dietary intake and growth pattern of children 9 – 36 month of age in an urban slum in Delhi. Indian Pediatr., 2005; 42(4): 351–356.