NUTRITIONAL STATUS OF THE UNDER FIVE CHILDREN OF ARMED FORCES PERSONNEL

Col MC KAPILASHRAMI (Retd) ^{*}, Lt Col RS VIRK ⁺,
Maj K CHATTERJEE [#]

ABSTRACT

Three hundred and one underfive children belonging to Armed Forces families were studied for their anthropometric and haemoglobin status. Their weights, MUAC and haemoglobin were superior as compared with the children in the general civil population as reported in various studies. 82.39% had weights above 80% of Harvard median. Chest circumference and head circumference crossing took place between 12-23 months. 69.56% had MUAC within normal limits and 59.81% had haemoglobin levels of 11 gm/dl or more. The healthier nutritional status of the underfives in the Armed Forces population is attributable to a healthier environment and an easy access to comprehensive health care facilities made available to them. It can be further improved by augmenting and modernising the MCH services with a view to provide quality care.

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KEY WORDS: Anthropometry; Armed Forces families; Nutrition and growth; Nutritional status; Underfives.

Introduction

It is generally, believed that the nutritional status of the pre-school child reflects the nutritional status of a community. The needs of these children require special attention because of their vulnerability. Their growth and development demand specific inputs like better nutrition, control of communicable diseases, efficient maternal and child health services and overall a better standard of living.

As the Armed Forces provide an environment which is conducive to a healthier growth and development, a survey was undertaken to study the morbidity pattern of under five children of the Armed Forces personnel. Assessment of the nutritional status was carried out as a part of this survey. The findings of this assessment are presented in this paper.

Material and Methods

The study was conducted as a community based cross-sectional analytical epidemiologic design study on the Army population residing in Pune Cantonment. The population comprised of children below five years of age. The population under study comprised of 2765 families with a total of around 1400 children under five years of age. By systematic random sampling a study sample of 301 children of under five years was obtained. The study was carried out from 01 May 96 to 31 Dec 96.

A detailed study schedule was designed and subjected to a pre-test on 10% of the study sample to ensure standardisation and findings included in the main analysis. The study was conducted by personal interview method from the parents.

Detailed anthropometric examination of each child was carried out using standard techniques [1, 2]. Weight was determined using Salter spring balance with minimum of undergarments to the near-

est 100 gm. The balance was tested for accuracy each day. The Mid Upper Arm circumference (MUAC) was measured at the mid point of left upper arm located between the tip of acromion process of scapula and the olecranon process of ulna after bending the left elbow to a 90 degree angle and placing forearm and palm across the trunk. The mid point was marked and the arm repositioned for the circumference measurement to the nearest cm. The variables studied included age, weight, head and chest circumference, mid upper arm circumference and hemoglobin status. The data so obtained was analysed with relevant statistical tests.

Results

The distribution of the underfive children according to age and sex is presented in Table 1. Three hundred and one children were studied.

TABLE 1
Distribution of children according to age and sex

Age groups (months)	Male	Female	Total
0-11	38	45	83
12-23	30	32	62
24-35	28	25	53
36-47	25	27	52
48-59	30	21	51
Total	151	150	301

Weight for age status

The age-wise distribution of mean weights is as shown in Table 2.

Grades of nutritional status

The assessment for malnutrition was done according to the Indian Academy of Paediatrics (IAP) classification as shown in

^{*} Director, NIH & FW, New Delhi (Formerly Professor of PSM at AFMC), ⁺ Reader, Department of PSM (Preventive and Social Medicine), Armed Forces Medical College, Pune 411 040. [#] DADH, HQ 2 MIN Div (Med), C/o 99 APO.

TABLE 2

Mean weight according to age and standard deviation

Age (months)	Mean (kgs)	Standard Deviation	Frequencies
< 12	6.48	2.20	83
12-23	9.25	2.10	62
24-35	11.41	1.81	53
36-47	12.91	1.92	52
48-59	15.48	3.38	51

Table 3. 248 (82.39%) of the children were normally nourished, 40 (13.28%) had mild, 11 (3.65%) had moderate and 2 (0.66%) had severe malnutrition.

TABLE 3

Distribution of under fives by grades of malnutrition

IAP grades (% of Harvard median)	Frequencies (n=301)	Percentage
Upto > 80% normal	248	82.39
71-80% (I degree)	40	13.28
61-70% (II degree)	11	3.65
51-60% (III degree)	2	0.66

Head and chest circumference

In the age group below 12 months, the mean chest circumference of 41.67 cms was lesser than the mean head circumference of 41.82 cms. The former crossed the latter in age group 12 to 23 months being 45.73 cms and 44.55 cms respectively (Table 4).

TABLE 4

Head and chest circumference- correlation according to age

Age group in months	Frequencies	Head		Chest	
		Mean	SD	Mean	SD
0-11	83	41.82	5.19	41.67	4.88
12-23	62	44.55	2.60	45.73	3.64
24-35	53	46.08	1.78	47.94	2.80
36-47	52	47.72	1.49	49.40	2.28
48-59	51	48.68	1.31	51.18	3.02

Mid upper Arm Circumference (MUAC)

160 (69.56%) children aged 1 to 5 yrs had mid arm circumference within normal limits (more than 13.5 cm) while 62 (26.95%) had MUAC between 12.5 to 13.5 cms (mild malnutrition), and 8 (3.47%) had MUAC below 12.5 cms (moderate to severe malnutrition) as shown in Table 5.

Anaemia

Haemoglobin estimation was carried out in 102 (33.88%) children (Table 6). 61 (59.81%) of them had haemoglobin levels of 11 gms/dl or more and were, therefore, not anaemic. 41 (40.19%) had mild to moderate anaemia, i.e. Haemoglobin less than 11 gms/dl. Of the anaemic children only 7 (17%) had haemoglobin levels of less than 9 gms/dl.

Discussion

In our study, while all age groups are well repre-

TABLE 5

Mid upper arm circumference of the subjects (1-5 years)

Mid upper arm circumference (cms)	Frequency (n=230)	Percentage (%)
< 12.5	8	3.47
12.5 to 13.5	62	26.95
> 13.5	160	69.56
Total	230	100.00

TABLE 6

Distribution of children as per haemoglobin status

Level of Hb in gms/dl	No. of children (n=102)	Percentage
< 9 g/dl	7	6.86%
9-10 g/dl	34	33.33%
11 g/dl & >	61	59.81%
	102	100.00%

sented, maximum number of children, 83 (27.9%), were in the 0-11 months group. The male-female distribution is almost equal. Progressive increase in weight was observed with the increase in age group.

Going by Wt for age, 82.39% (248) of the children in our study were normally nourished (weights above 80% of Harvard mean). 16.93% (51) children had mild to moderate malnutrition, while only 0.66% (2 Nos) had severe malnutrition (Table-3). Joshi et al (1989) [3] in a similar study at Hyderabad reported 92% of the children (1-4 yrs) in their series to be nutritionally normal. Our findings are also similar to those of Ghai et al [4] and Dutta & Banik et al [5]. However, these differ markedly from those of Mishra et al [6] and Kapil and Bali [7], who reported undernutrition from 78 to 81% in their subjects in a tribal block in UP and the Delhi slums respectively. The National Nutrition Monitoring Bureau report of 1996 [8] on the nutritional status of rural population also gives a high rate of prevalence of moderate to severe malnutrition at 50% in children aged 3-5 years.

Head and chest circumference were positively correlated with a correlation coefficient of r equal to 0.82. This correlation when subjected to test of significance, was observed to be highly significant ($p < 0.01$). The mean chest circumference crossed the mean head circumference in the age group 12-23 months, being 45.73 cms and 44.55 cms respectively (Table 4). These findings differ from those of Mathur et al [9] and Ghai et al [4], where the crossing is reported between 24-40 months. However, their studies were predominantly on rural based populations.

62 (26.95%) of the children had mid upper arm circumference (MUAC) between 12.5 to 13.5 cms (mild malnutrition), and 8 (3.47%) had MUAC less than 12.5 cms showing moderate to severe malnutrition (Table 5). These findings are similar to those of Joshi et al [3] and Asha Arya and Rohini Devi [10] but are healthier than those reported by Ghai et al [4]. The MUAC compares well with the IAP grades of malnutrition wherein 4.31% of the subjects had second and third degree malnutrition.

Of the 41(40.19%) anaemic children, only 7 (17%) had haemoglobin levels less than 9 gm/dl. The hemoglobin status of these children was much better than that reported by Sharma et al [11], Gupta and Agarwal [12] and Mudkhedkar and Shah [13] who reported 50 to 55% of children having anaemia. This is an indicator of a better nutritional status of these children.

In conclusion, the results of this study are on expected lines. The health status of the underfives in the Armed Forces population is much better than their counterparts in the general civil population in the country; both urban and rural. Nevertheless, 18% of the underfives having mild to moderate under-nutrition is not acceptable; given the socio-economic and environmental milieu of the Armed Forces. Necessary steps to further improve the situation need to be taken on priority by augmenting and modernising the MCH services with a view to provide quality care.

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