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Assessment of Physical Growth among the under 6 Years Children in Rural Area in Gorgan, Iran

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Abstract: Growth monitoring in children has been known as the best index for assessment of nutritional status of a society. This study has been carried out to determine physical growth (Height and weight) and nutritional status of children less than 6 year of age, living in Gorgan city suburb villages. In this descriptive study, sampling was done in one-step, by clustering method, and about 10% (2802 persons) of rural children under 6 years were investigated. Weight and height were measured with accuracy of 0.1 kg and 0.1 cm respectively. The exact age of the children was obtained from the files kept in the rural health centers. Comparison of the groups was done with the help of t. test and NCHS standard as reference. The results indicate that girls have better somatic growth than the boys. The prevalence rate of malnutrition increases after the breast-feeding period. The boy's 43.93% and 5.11% are under the 2SD NCHS standard for height and weight respectively. But the figures for the girls are 31.49% and 6.94% respectively. Chronic malnutrition (Delay in height growth) is observed more than the acute malnutrition (Delay in weight growth) in the children under 6 years living in Gorgan suburb villages. Malnutrition is more in boys than the girls, and increase after breast feeding period.

Key words: Children, height, weight, malnutrition, Gorgan

Introduction

Human health depends on two factors genetics and environment. Genetics factor is very important also the effect of environmental factor and nutritional statues is more than genetics.

The study of child growth status is the most important. Criteria for recognizing its health (Navaii and kimiagar, 1992).Child's weight and height changing is the clinical signs of the growth. In other hand, child height and weight are good index for Recognizing its nutritional status, so the comparison of the child height and weight to standard tables can be used for screening or finding malnutrition case. The children need suitable biological condition for getting the highest physical growth and each unfavorable factor can have bad influence on their growth. Malnutrition causes unsuitable fields in the healthy of the body, psyche and growth. So that battling against that is very hard and in many cases is impossible. By 1985, in third world countries, using the growth charts and monthly record were hard and impossible.

Nowadays, by increasing nutritional information and its importance on children health and programming about growth monitoring, in third world countries, it is impossible to carry out the program of the growth monitoring (Aytollahi, 1993). Unicef announced that the children of the 0-4 years affected by moderate and sever under weight are 42 and 36 respectively (Barghi and Asefzadeh, 1997). In our country the studies, carried out in 1992 and 1996, indicate malnutrition is the most in the children under 5 years. In 1999, the studies carried out in the children under 5 years indicate the malnutrition is still as a main problem (Sayari *et al*., 2000).

It is obvious that the evaluation of the operation and result of the growth monitoring program of the children can be very important evaluation of the children growth is the best way for finding families, area, national and international levels (Karamizadeh and Keshavarz, 1996) This study carried out in the villages of Gorgan on the children under 6 years in 1999. 54% of Gorgan population are rural. The most population of this township is concentrated between northern mountainside and Gorganrud and its accumulation decreases towards southern heights and the borderline of Turkmenistan. Gorgan city consists of two central district, Agh-ghala and 9 rural districts. Gorgan and Agh-ghala are the cities of Gorgan.

Materials and Methods

Twenty villages were chosen via random systematic sampling method from 118 villages. The height and weight of all the children under 6 years were measured from chosen villages. On the whole, from 21987 rural who are in this age group, 2802 of them were studied. Among them, 1423 and 1379 are boy and girl respectively. So in the chosen villages 10% of the chosen people and all of the children who had necessary qualifications were studied. In the similar studies, this method was used.

The height of the children, who are not able to stand,

were measured in a Lying posture and the height of those who are able to stand were measured in a standing posture without shoe and 4 parts of their body (heel, scapula, back of the head) attached to the wall. The weight, with less clothes, has been measured with scales confirmed by WHO with 0.1kg accuracy and height has been measured with 0.1cm accuracy (Rosalind, 1990). The children exact age has been selected from health records in health house. In this study, age has been considered as continual age and the measures of height and weight have been got by a group consists of 20 numbers. After collecting coding sheet the information, statistical analysis and drawing the graphs were done statistical soft war. T test and national center for health system standard have been used as reference to compare the groups. Similar study of the Iran villages has been used for proportional comparison of the children under –2SD standard.

Results

Tables of 1 and 2 indicate mean and standard deviation of the children's height and weight according to age sex. Tables 3 and 4 indicates the measure of the height and weight based on standard deviation (SD) from standard mean (NCHS). According to table 3, the height of 34.93% and weight of the 5.11% of boys under study are lower than –2SD and height of 18.23% and the weight of 0.76% of them are lower than –3SD standard NCHS. According to Table 4, the height of 31.4% and weight of 6.4% of girls under study are lower than –2SD and the height 18.27% and weight of the 0.9% of them are lower than –3SD standard NCHS.

The Fig. 1a shows curve of trend of increase of children's height and weight under 6 years of the Gorgan villages by percentile 50th standard NCHS. The percentiles of the height and weight of the children under study have been shown in the Fig. 1b. Equally in all of ages, the measure of the little boys height is about 12 month shorter the boys in U.S.A. In fact, the measure of a rural 4 years old boy's height is as the same as a 3 years old boy standard NCHS. By increasing age, the distance of curve of trend of increase of boy's weight becomes more than standard curve. On average, the little boys weight in comparison with the children at the some age are about 6 month less than NCHS.

The mean of the measure of the girls weight is similar to curve of 50th percentile standard until 30 month and after that, it shows that curvature comes down and by increasing age, this distance gets more. On the average, the girls' weight under study are about 3 month less than the children at the same age in NCHS standard.

The most malnutrition is seen among little boys and girls at the age 12-24 and 24-36 month respectively. Significant statistical differences are seen between mean and standard deviation of children height under study in comparison with the view of weight among little boys at the age from 4 month to 6 years old, this difference is significant.

Table 1: Mean and Standard deviation weight and height boys under 6 year in villages of Gorgan

Age (Mo)	Frequ-ency	WT (kg)	HT (cm)	Mean ±SD	Mean ±SD
6	249	7.55	2.33	63.74	10.94
18	267	10.94	1.58	76.68	10.6
30	258	13.71	1.94	84.76	14.65
42	254	14.86	1.81	92.67	12.35
54	283	16.25	1.89	98.09	17.22
66	112	17.63	2.42	108.24	12.04

Table 2: Mean and Standard deviation weight and height girls under 6 year in villages of Gorgan

Age (Mo)	Frequ-ency	WT (kg)	HT (cm)	Mean ±SD	Mean ±SD
6	279	7.15	2.16	63.66	9.62
18	243	10.64	2.52	75.89	10.6
30	248	12.88	3.28	85.31	8.66
42	258	14.2	1.97	91.28	12.12
54	259	15.81	2.08	96.98	16.88
66	110	17.13	2.54	106.51	13.26

F = Frequency

Discussion

According to the results of this study, shunting of the height is one of the nutritional problems of the children under 6 years in Gorgan districts. In comparison with CHS standard in some ages, shunting is more than 1 year, by increasing age, this difference will be more. The effective factors causing this difference consists of increasing the need for protein sources, decreasing the intake of it and trace element deficiency, Iron , Iodine and Zinc in children food sources.

The studies carried out in Iran (Sayari, 2000) and regional (Navad *et al*., 1982) in some regions of country have presented similar results. The above study indicate weight reduction is one of the main nutritional problems of the children under five years old but malnutrition resulting of weight is less than shortness of the height. The present study has the similar results.

In this study and similar studies (Mahapatra *et al*., 2000), prevalence of the malnutrition among girls is less than boys and the most prevalence of the malnutrition is observed in boys and girls at the age of 2 and 3 years old respectively. Although, finding the reason of the difference between two sexes need wide investigation but increasing of prevalence after 2 years old can be related to cutting off breast feeding, beginning the extra feeding and mothers again delivery. And lack of enough care of the first child. Similar studies have been indicated the most malnutrition is in 3 old years children (Moteai, 1997). Without considering sexuality Abdollah in his study has reported that in Arabia, the most weight reduction between 1-2 years old (Abdullah, 1982) also Nilferoshan (Nilforoushan, 1995) survey, which has presented on prospective study on 393 children from beginning of the birth to 3 years old, indicates that if

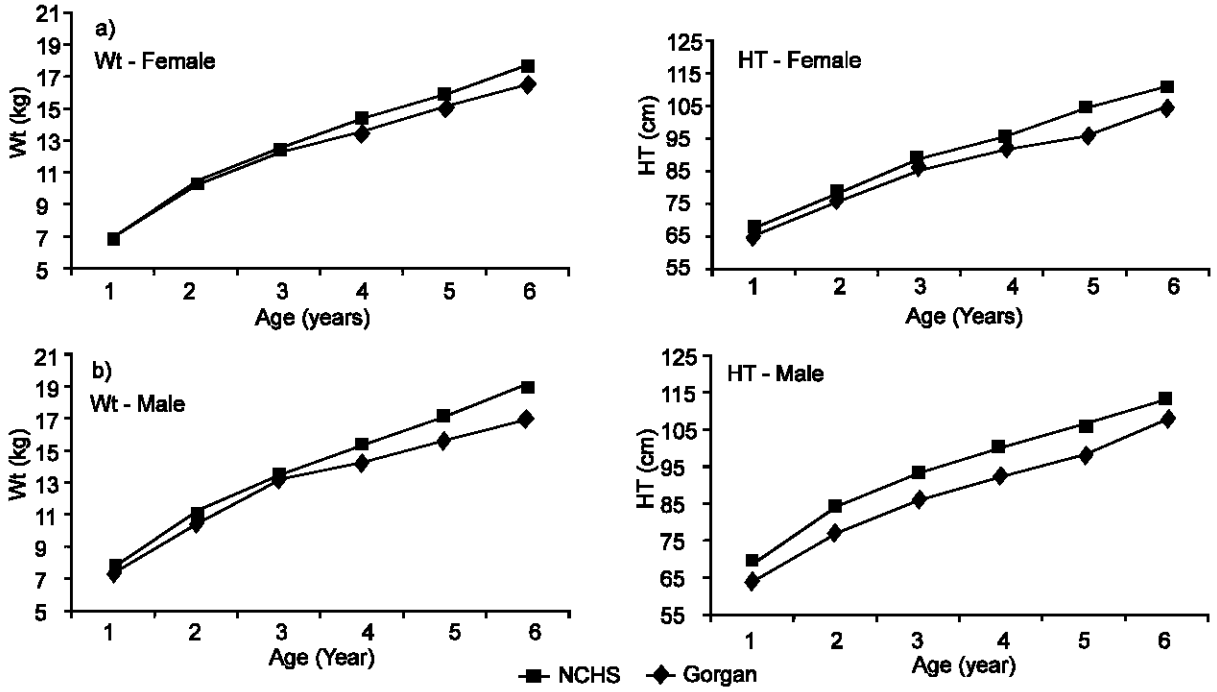

Fig. 1: The comparison of the growth among children under sex years of Gorgan

Table 3: Frequency of height and weight on base of the under Standard Deviation (SD) from mean of NCHS (Male)

Age (mo)	Frequency	-1SD		-2SD		-3SD	
		Weight Freq (%)	Height Freq (%)	Weight Freq (%)	Height Freq (%)	Weight Freq (%)	Height Freq (%)
0-12	249	43 (17.3)	114 (45.8)	7 (2.8)	60 (24.9)	0 (0)	20 (8)
12-24	267	88 (32.9)	166 (62.2)	25 (9.4)	114 (42.7)	3 (1.1)	80 (29.9)
24-36	258	81 (31.4)	153 (59.3)	11 (4.3)	108 (41.9)	4 (1.6)	60 (23.3)
36-48	254	67 (26.4)	142 (55.90	8 (3.1)	81 (31.9)	1 (0.4)	35 (13.8)
48-60	283	87 (30.7)	147 (51.9)	16 (5.7)	95 (33.4)	3 (1.1)	44 (15.50
Total	1311	366 (27.9)	722 (55.1)	67 (5.1)	458 (34.9)	10 (0.8)	239 (18.2)

Table 4: Frequency of height and weight on base of the under Standard Deviation (SD) from mean of NCHS (Female)

Age (mo)	Frequency	-1SD		-2SD		-3SD	
		Weight Freq (%)	Height Freq (%)	Weight Freq (%)	Height Freq (%)	Weight Freq (%)	Height Freq (%)
0-12	280	45 (16.1)	107 (38.2)	14 (5)	46 (16.4)	0 (0)	14 (5)
12-24	246	62 (25.2)	138 (56.2)	19 (7.7)	91 (36.9)	3 (1.2)	53 (21.50
24-36	246	70 (28.4)	147 (59.7)	17 (6.9)	115 (47.7)	1 (0.4)	70 (28.4)
36-48	257	76 (29.5)	130 (50.5)	15 (5.8)	78 (30.3)	6 (2.3)	44 (17.1)
48-60	259	75 (25.4)	159 (53.8)	27 (9.1)	97 (32.8)	2 (0.6)	51 (17.2)
Total	1324	328 (24.8)	681 (51.4)	92 (6.9)	417 (31.5)	12 (0.9)	242 (18.3)

parents obey health rules, trend of the growth of the child's height and weight will be accord to standard until 3 years old. Considering the results, we can conclude that children under sex years of Gorgan villages suffer from chronic more than acute malnutrition. Malnutrition among boys is more than girls and it will be increased after breast feeding. With regard to results and comparing with standard, environmental factors is effective in delaying height and weight growth. So the parents must be educated to know the primary health cares in related to good feeding which is leading children health. It is necessary to know the factors causing the difference of height and weight growth in girls and boys and probably the effective trace elements in the shortness of the children in this area.

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