

SOME OBSERVATIONS ON HEAD CIRCUMFERENCES IN CHILDREN WITH NUTRITIONAL DEFICIENCIES

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During the last three years in the Government Children's Hospital in Amman, where at least 25 per cent of the children admitted suffer from nutritional deficiencies (either malnutrition or undernutrition), we have noticed that the head circumferences of these children are small when compared with average head circumferences of children of the same age.

Head circumferences were not taken routinely in 1958 and 1959 but in 1960 we admitted 1260 patients to the Children's Hospital and recorded head circumferences routinely in all cases along with heights and weights.

After reviewing all these measurements, we established that the head circumferences in children with nutritional deficiencies were, in the vast majority of cases, smaller than those of children of the same age who were not suffering from nutritional difficulties.

It has long been known that stunted growth, as shown mainly by retarded height, accompanies loss of weight in children suffering from malnutrition or undernutrition. However, to our knowledge, no mention has been made of retarded growth of the skull, as identified by head circumference measurements, in these children. This is the subject of our observations.

We are presenting a study of 100 patients with nutritional deficiencies admitted to our hospital during the first half of the year 1960. Their ages ranged from two months to three years. Children displaying definite microcephaly associated with mental retardation of one sort or another were excluded from the study.

In 97 of these 100 children the head circumferences were below average normal (median) levels for the same age and sex. The average normal figures were calculated from tables presented in Nelson's *Textbook of Pediatrics*¹ as no local figures are available. Heights in 94 of these 100 children were also retarded when compared with the average normal figures for same age and sex, running hand in hand

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with the head circumferences. In about 60 of these cases heights and head circumferences ranged from 70 to 90 per cent of normal (100 per cent representing the median figure for normal children) and in the other 40 cases the heights and head circumferences were found to range from 91 to 100 per cent of the average normal figures. In no case were the calculations based on maximum figures for normal children.

TABLE 1

RANGE OF WEIGHTS, HEIGHTS AND HEAD CIRCUMFERENCES IN 100 MALNOURISHED CHILDREN EXPRESSED AS PER CENT OF AVERAGE FIGURES FOR NORMAL CHILDREN *

AGE	NUMBER OF CASES	WEIGHT	HEIGHT	HEAD CIRCUMFERENCE
2 — 6 Months	31	39%—82%	76%—100%	76%—100%
7 —12 "	28	41%—80%	79%—100%	83%— 97%
13 —24 "	26	33%—74%	77%— 97 %	78%—100%
25 —36 "	15	45%—56%	68%— 92%	76%— 98%

- * In each case, 100 per cent represents the 50th percentile for same age and sex, as given in the tables in Nelson.¹

TABLE 2

COMPARATIVE MEASUREMENTS IN SELECTED CASES EXPRESSED AS PER CENT OF AVERAGE FIGURES FOR NORMAL CHILDREN *

AGE IN MONTHS	WEIGHT •	HEIGHT•	HEAD CIRCUMFERENCE•
	PER CENT	PER CENT	PER CENT
4	67	95	92
36	46	70	84
10	45	97	100
9	54	100	91
36	34	68	76
6	62	95	91
4	58	88	92
16	48	93	87
5	45	83	86
20	38	81	80

- * In each case, 100 per cent represents the 50th percentile for same age and sex, as given in Nelson.¹

TABLE 3

RANDOM SELECTION OF 20 CASES SHOWING DIVERGENCES FROM
MEASUREMENTS OF NORMAL CHILDREN

SEX	AGE IN MONTHS	WEIGHT IN GRAMS*	HEIGHT IN CENTI-METERS*	HEAD CIRCUMFERENCE IN CENTIMETERS		
				Patients	Normal Children	
					Max.	Min.
M	12	4,430 (10,070)	65 (75.0)	40	44.9	48.9
F	24	8,200 (12,290)	77 (86.6)	45	45.8	50.9
M	15	7,800 (10,750)	70 (78.5)	44	45.6	49.8
M	18	5,570 (11,430)	71 (81.8)	44	46.2	50.6
F	9	4,450 (8,710)	63 (70.1)	41	42.6	47.2
F	3	2,370 (5,620)	51 (59.5)	34.5	37.9	42.3
M	6	3,920 (7,580)	63 (66.4)	39	42.1	45.9
M	9	4,610 (9,070)	65 (71.2)	41	43.8	47.8
F	18	6,070 (11,110)	76 (80.9)	43	44.9	49.8
F	7.5	3,930 (7,985)	61 (67.7)	40	41.8	46.3
F	18	8,220 (11,110)	73 (80.9)	43	44.9	49.8
M	24	6,360 (12,560)	72 (87.5)	45	47.0	51.7
F	20	5,140 (11,700)	70 (83.3)	44	45.2	50.0
M	7	4,480 (8,000)	66 (68.0)	43	42.8	46.5
F	15	8,620 (10,430)	71 (77.6)	43	44.3	49.1
M	14	6,280 (10,500)	73 (77.0)	45	45.4	49.5
F	12	5,160 (9,750)	66 (74.2)	40	43.6	48.4
M	24	7,200 (12,560)	75 (87.5)	45	47.0	51.7
F	30	8,100 (13,430)	79 (91.4)	46	46.3	51.5
M	36	6,700 (14,610)	71 (96.2)	46	47.9	52.7

- * Figures in parentheses are 50th percentiles for same age and sex in a group of normal children, as given in Nelson.¹

REFERENCES

1. Nelson, W. E.: Textbook of Pediatrics, Ed. 6, Philadelphia, 1954, W. B. Saunders Company, p. 52 ff.