

Results of Anthropometric Studies of the Head of Boys and Girls with Adenoids

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Abstract:

Under the influence of the environment, the transformation of the development of the organism in growth develops, which reflects the physical development. The morphometry of physical development is reflected in the indicators of anthropometry, physiognometry and data of functional activity. Height, weight and chest circumference are the main anthropometric parameters of physical development of children at certain stages of ontogenesis.

Keywords: anthropomertia, children, adenoid hypertrophy, physical development

Objective: to analyze the parameters of physical development of children aged 3-11 years and children with adenoid hypertrophy

Materials and methods: The study was carried out on the basis of the ENT department of the Bukhara Oblast Children's Hospital. The number of children before and after adenotomy surgery was 348 (181 boys and 167 girls). Accordingly, in children with adenoid hypertrophy and 6 months after surgery, body length was measured with a height gauge, body weight with special medical scales, and chest circumference with a measuring tape. During the same periods, a survey of parents was conducted on a 10-point scale to assess the overall children's condition (Table 1).

The subject of the study was the anthropometric parameters of the head and face. In the course of scientific research, a set of methods was used, depending on the tasks set: anthropometric, morphometric, statistical methods.

Introduction

Changes and generalization of morphofunctional traits depending on the environmental conditions of physical development are indicators of their genetic factors [112, p. 139-145; 117, pp. 275-282]. As a result, the latter changes in the process of physical development in a positive or negative direction [45, p. 566-567; 84, p. (in Russian). 204-204a].

According to N.N. Rudenko and I.Y. Melnikov (2010), one of the informative criteria of children's health, which characterize this dynamic process, determines the development of the child in the physical plane [77, p. 121-123].

Centile tables are the main and widespread methods for determining the harmony of children's physical development [20, p. 73–79], which are based on measurements of anthropometric parameters of a large number of children under study and indicate the average values of the parameters of weight, height, circumference of the chest cavity and head, which in turn makes it possible to compare the rates of growth and growth of the individual development of the child [112, p. 139-145].

There are separate tables for male and female children. Head circumference is assessed only up to the first year of children's life, and already in preschool and school age, height, body weight and chest circumference are considered important indicators [21, p. 73-79; 26, p. (in Russian). 86-100]. With the help of mathematical formulas for the body mass index method, it is possible to characterize the development of the physical state by the ratio of individual anthropometric parameters [24, p. 165-166; 115, p. (in Russian). 91-101.].

At present, despite the standardization of research, the search for the most informative methods, there is still no accurate assessment of indicators of physical development [26, p. 86-100; 54, p. (in Russian). 59-64; 117, p. (in Russian). 275-282; 119, p. (in Russian). 578-583].

The study of the peculiarities of health formation helps in the study of the physical development of a large number of children and adolescents [26, p. 86-100].

The results of basic morphometric measurements are used as standards for assessing physical development [110, p. 10-15; 118, c. 280-283].

According to the WHO, there are uniform international norms (standards and standards) that characterize the physical development of children [26, p. 86-100].

In the development of a child, the causes of various health deviations are improper nutrition, environmental factors, pathologies, genetics, and ethnicity [51, p. 49-54; 74, pp. 257-260; 113, pp. 27-28; 114, c. 845-854].

Results. The results show that the average head circumference of 3-year-old male children was 48.9 ± 0.20 cm, and that of girls was 48.5 ± 0.20 cm $\pm\pm\pm$. $\pm$ When measuring the transverse size of the forehead of the studied male children, it averaged 9.1 ± 0.10 cm, and in females it was 9.20 ± 0.10 cm. At the same time, the vertical (height) diameter of the head of boys is on average 9.8 ± 0.10 cm, and in girls it is on average 10.1 ± 0.20 cm. In males, the length of the skull base is on average 11.1 ± 0.10 cm and the width of the skull base is on average $11.10.10$ cm. 11.6 ± 0.20 cm, and in females it averaged 11.5 ± 0.10 cm and 11.6 ± 0.10 cm, respectively.

The indicators of 4-year-olds did not differ significantly from those of 3-year-olds ($P > 0.05$), almost repeating the above parameters. The head circumference of 4-year-old male children averaged 48.8 ± 0.10 cm, and that of females averaged 48.6 ± 0.01 cm. In boys, the longitudinal diameter of the head was on average 9.7 ± 0.10 cm, in girls it was an average of 9.80 ± 0.03 cm $\pm$. $\pm$ The average transverse forehead size of boys was 9.3 ± 0.10 cm, that of girls averaged 14.4 ± 0.10 cm, and the vertical diameter of the head averaged 10.2 ± 0.10 cm and 10.0 ± 0.10 cm, respectively. The length of the base of the skull of boys was on average 11.6 ± 0.10 cm and in girls it was on average 11.6 ± 0.10 cm. The width of the base of the skull in male children was on average -12.7 ± 0.10 cm, in women it was on average -12.4 ± 0.10 cm

By the age of 5 years, there were slight but significant increases in size compared to 3- and 4-year-old children ($P<0.05$). The head circumference of these male children was on average 49.8 ± 0.10 cm, in the female sex it was on average 49.6 ± 0.20 cm. The longitudinal diameter of the head of boys was on average 10.5 ± 0.10 cm, in girls it was on average 10.0 ± 0.03 cm. The transverse size of the head in males was on average 14.4 ± 0.10 cm, in females it was on average 14.4 ± 0.04 cm. The vertical diameter of the head in males averaged 10.9 ± 0.10 cm, and in females it was 10.2 ± 0.03 cm. The length and width of the base of the skull in boys were equal to an average of 12.1 ± 0.10 cm and 12.7 ± 0.10 cm, respectively. In girls, the same parameters were 12.0 ± 0.10 cm and 12.6 ± 0.10 cm.

In 6-year-old children, almost all 7 head parameters were significantly higher than the same indicators of 3- and 4-year-old children ($P<0.05$) and 4 parameters were significantly higher (except for the longitudinal diameter of the head and zygomatic diameter) in relation to 5-year-olds.

By the age of 6 years, the average head circumference of males was 49.4 ± 0.10 cm, and that of girls was 51.7 ± 0.10 cm. The longitudinal diameter of the head in males was on average 11.0 ± 0.10 cm, and in females it averaged 10.5 ± 0.10 cm. The transverse size of the forehead was 10.2 ± 0.10 cm in males and 9.90 ± 0.04 cm in females. The length of the skull base in male children was on average 13.1 ± 0.10 cm and in females it was 12.5 ± 0.10 cm. The width of the skull base was on average 13.9 ± 0.10 cm and 12.7 ± 0.10 cm, respectively. By the age of 6 years, the average head circumference of males was 49.4 ± 0.10 cm, and that of girls was 51.7 ± 0.10 cm. The longitudinal diameter of the head in males was on average 11.0 ± 0.10 cm, and in females it averaged 10.5 ± 0.10 cm. The transverse size of the forehead was 10.2 ± 0.10 cm in males and 9.90 ± 0.04 cm in females. The length of the skull base in male children was on average 13.1 ± 0.10 cm and in females it was 12.5 ± 0.10 cm. The width of the skull base was on average 13.9 ± 0.10 cm and 12.7 ± 0.10 cm, respectively.

The 7-year-olds had the same trend of change as the 6-year-olds. In boys, the average head circumference was 51.5 ± 0.30 cm, in girls it was 51.9 ± 0.30 cm on average, and the longitudinal diameter of the head averaged 12.4 ± 0.10 cm and 11.2 ± 0.10 cm in the same way. In males, the transverse

The average head size was 14.9 ± 0.03 cm, and the average size of the female head was 14.7 ± 0.04 cm. The transverse size of the forehead in boys was on average 10.4 ± 0.1 cm, in girls it was 10.0 ± 0.04 cm on average. In male children, the vertical diameter of the head was on average 11.3 ± 0.10 cm, in females it was 10.5 ± 0.10 cm. The length and width of the base of the skull in boys were equal to an average of 13.6 ± 0.10 cm and 13.9 ± 0.10 cm, and for girls the average was 12.1 ± 0.10 cm and 13.5 ± 0.10 cm, respectively (Table 3.5.1.)

It was also noted that there was a gradual increase in the size of the head in 8-year-old children, almost all parameters were significantly different from previous age groups. It should be noted that the average head circumference of boys was 53.9 ± 0.20 cm, and that of girls it was 54.1 ± 0.20 cm on average.

The longitudinal diameter of the head of male children averaged 13.3 ± 0.08 cm, while that of females averaged 11.6 ± 0.10 cm. The transverse size of the head in males averaged 15.3 ± 0.04 cm, in females it averaged 14.6 ± 0.04 cm, and the transverse size of the forehead averaged 11.1 ± 0.04 cm and 10.1 ± 0.04 cm, respectively. In boys, the vertical diameter of the head was on average 11.5 ± 0.08 cm, in girls it was on average 10.6 ± 0.10 cm.

The length of the skull base in males is on average 14.1 ± 0.13 cm and the width of the skull base is on average 14.6 ± 0.09 cm. The length of the skull base in females is on average 12.4 ± 0.10 cm and the width of the skull base is on average 13.6 ± 0.10 cm.

The trend of gradually increasing head size continued in 9-year-olds of both sexes. In male children, the head circumference was on average 53.8 ± 0.18 cm, in women it was 54.3 ± 0.20 cm. In males, the longitudinal diameter of the head was on average 13.5 ± 0.07 cm, in females it was 11.9 ± 0.04 cm, the transverse size of the head in boys was on average 14.2 ± 0.20 cm, in girls it was on average 14.7 ± 0.07 cm. The vertical diameter of the head is on average 11.9 ± 0.04 cm and 10.8 ± 0.04 cm, respectively. In males, the length of the skull base was on average 14.4 ± 0.12 cm, in females it averaged 12.3 ± 0.10 cm, and the width of the skull base was on average 14.8 ± 0.09 cm and 13.6 ± 0.10 cm, respectively.

Table 3.5.1

Anthropometric parameters of the head of children 3-7 years old with hypertrophy of the pharyngeal tonsil

Age	3 – Flight		4 – Flight		5 – Flight		6– Flight		7– Flight	
Floor	M	D	M	D	M	D	M	D	M	D
PRR	13,4-15,0 $14,3 \pm 0,11$	12,6-14,4 $13,7 \pm 0,12$	13,7-14,5 $14,1 \pm 0,05$	13,7-15,3 $14,4 \pm 0,01$	13,4-15,3 $14,4 \pm 0,01^*$	13,9-14,9 $14,4 \pm 0,08$	13,8-15,5 $14,7 \pm 0,1$	13,5-15,2 $14,5 \pm 0,1$	14,4-15,3 $14,9 \pm 0,0$	13,7-15,5 $14,5 \pm 0,1$
PrD F	8,8-10,2 $9,6 \pm 0,1$	6,6-10,4 $9,6 \pm 0,2$	8,1-11,6 $9,7 \pm 0,1^*$	9,4-10,3 $9,8 \pm 0,0$	8,7-12,4 $10,5 \pm 0,1^*$	9,4-10,4 $10,0 \pm 0,0^*$	9,8-12,6 $11,0 \pm 0,1^*$	9,5-11,4 $10,5 \pm 0,1^*$	11,4-13,3 $12,4 \pm 0,1^*$	10,7-11,6 $11,2 \pm 0,0^*$
OG	46,5-51,2 $48,9 \pm 0,2$	45,7-51,2 $48,5 \pm 0,2$	47,2-50,3 $48,8 \pm 0,1$	46,8-50,3 $48,6 \pm 0,1$	48,3-51,3 $49,8 \pm 0,1$	47,0-52,2 $49,6 \pm 0,2^*$	48,0-50,8 $49,4 \pm 0,1$	49,9-53,5 $51,7 \pm 0,1^*$	47,8-55,2 $51,5 \pm 0,3$	48,0-55,7 $51,9 \pm 0,3^*$
PDL	8,1-9,8 $9,1 \pm 0,1$	7,8-11,0 $9,2 \pm 0,1$	7,3-10,8 $9,3 \pm 0,1^*$	8,8-10,4 $9,5 \pm 0,1^*$	8,6-11,3 $10,0 \pm 0,1^*$	8,7-10,6 $9,6 \pm 0,1^*$	9,1-11,0 $10,2 \pm 0,1^*$	9,5-10,4 $9,9 \pm 0,0^*$	9,6-11,4 $10,4 \pm 0,1^*$	9,6-10,5 $10,0 \pm 0,0^*$
VR G	8,8-10,5 $9,8 \pm 0,1$	7,4-13,0 $10,1 \pm 0,2$	8,4-11,8 $10,2 \pm 0,1^*$	8,8-11,0 $10,0 \pm 0,1$	9,6-12,2 $10,9 \pm 0,1$	9,6-10,6 $10,2 \pm 0,0$	10,6-11,5 $11,1 \pm 0,0$	9,4-11,3 $10,4 \pm 0,1^*$	10,2-12,2 $11,3 \pm 0,1^*$	9,6-11,3 $10,5 \pm 0,1^*$
DA UG HTE R	9,7-12,4 $11,1 \pm 0,1$	9,8-13,2 $11,5 \pm 0,1$	10,2-13,0 $11,6 \pm 0,1^*$	9,9-13,3 $11,6 \pm 0,1^*$	11,0-13,2 $12,1 \pm 0,1^*$	10,5-13,5 $12,0 \pm 0,1^*$	11,5-14,7 $13,1 \pm 0,1^*$	10,7-14,2 $12,5 \pm 0,1$	11,9-15,2 $13,6 \pm 0,1^*$	10,9-13,2 $12,1 \pm 0,1$

SHO	9,2- 13,9	10,0- 13,1	11,0- 14,4	10,8- 13,9	11,3- 14,1	11,2- 14,0	12,0- 15,7	11,3- 14,0	12,7- 15,2	12,2- 14,7
CH	11,6± 0,2	11,6± 0,1	12,7± 0,1*	12,4± 0,1*	12,7± 0,1*	12,6± 0,1*	13,9± 0,1*	12,7± 0,1*	14,0± 0,1*	13,5±0, 1*

Note: * is the confidence score ($P < 0.05$) compared to previous age.

The data obtained showed that in 10-year-old male children, the head circumference was on average 54.0 ± 0.23 cm, in females it was an average of 52.4 ± 0.23 cm±±.

Table 3.5.2

Anthropometric parameters of the head of children 8-11 years old with hypertrophy of the pharyngeal tonsil

Age	8 – Flight		9 – Flight		10 – Flight		11– Flight	
Floor	M	D	M	D	M	D	M	D
PRR	14,8- 15,8 15,3±0, 04*	14,1- 15,1 14,6±0, 0	14,7- 16,6 15,6±0, 07*	14,2- 15,1 14,7±0,0 *	15,2- 16,1 15,69±0, 04*	14,3- 15,3 14,80±0, 04*	15,5- 16,4 15,90±0, 04*	14,4- 16,3 15,20±0, 08*
PrD F	12,2- 14,2 13,2±0, 08*	10,7- 12,5 11,6±0, 1*	12,6- 14,4 13,5±0, 07*	11,4- 12,4 11,9±0,0 *	12,6- 14,5 13,70±0, 08*	11,7- 12,7 12,20±0, 04*	13,6- 14,4 13,99±0, 03*	12,1- 13,0 12,60±0, 04*
OG	51,4- 56,4 53,9±0, 2	51,6- 57,3 54,5±0, 2*	51,5- 56,1 53,8±0, 18	51,8- 56,8 54,3±0,2 *	51,0- 56,8 54,00±0, 23	52,4- 58,1 55,12±0, 23*	51,4- 58,3 54,56±0, 28	52,2- 58,9 55,58±0, 27*
PDL	10,6- 11,5 11,1±0, 036*	9,6- 10,6 10,1±0, 0*	10,7- 11,7 11,2±0, 04*	9,8-10,7 10,2±0,0 *	10,7- 11,6 11,20±0, 04*	9,90- 10,8 10,40±0, 04*	11,4- 12,4 11,80±0, 04*	9,80- 11,7 10,70±0, 08*
VR G	10,5- 12,4 11,4±0, 07*	9,8- 11,7 10,6±0, 1	11,6- 12,6 11,9±0, 04*	10,3- 11,3 10,8±0,0	12,0- 13,0 12,49±0, 04*	10,5- 11,3 10,90±0, 03*	12,5- 13,5 13,00±0, 04*	10,7- 11,7 11,20±0, 04*
DA UG HTE R	12,5- 15,7 14,1±0, 12*	11,0- 13,7 12,4±0, 1	12,8- 15,9 14,35± 0,12*	11,2- 13,4 12,3±0,1	13,1- 16,2 14,65±0, 12*	11,9- 14,5 13,20±0, 10*	13,5- 16,7 15,10±0, 13*	12,1- 14,7 13,40±0, 10*
SHO CH	13,5- 15,7 14,6±0, 08*	12,3- 14,8 13,6±0, 1*	13,7-16 14,8±0, 09	12,3- 14,9 13,6±0,1 *	13,9- 16,8 15,35±0, 12*	12,8- 15,2 14,00±0, 10*	14,2- 17,2 15,70±0, 12	12,9- 15,3 14,10±0, 10*

Note: * is the confidence score ($P < 0.05$) compared to previous age.

In males, the transverse size of the head was on average 14.2 ± 0.10 cm, in females it averaged 14.8 ± 0.04 cm. In males, the transverse size of the forehead was on average 15.7 ± 0.04 cm, in females it averaged 10.4 ± 0.04 cm. The length of the base of the skull in boys was on average 14.7 ± 0.12 cm and the width of the base of the skull was on average 15.4 ± 0.12 cm. The length of the base of the skull in girls was on average 13.2 ± 0.10 cm and the width of the base of the skull was on average 14.0 ± 0.10 cm.

The facial parameters of 10-year-old children were almost at the level of 8- and 9-year-old children, the results of which did not differ significantly ($P > 0.05$), significant changes were noted compared to children of 3-7 years ($P < 0.05$).

The average head circumference of 11-year-old male children was 54.5 ± 0.28 cm, and that of females was 55.5 ± 0.27 cm. The longitudinal diameter of the head was 13.9 ± 0.03 cm for boys on average and 12.6 ± 0.04 cm for girls. In girls, the average was 10.7 ± 0.08 cm.

In males, the vertical diameter of the head was on average 13.0 ± 0.04 cm, in females it averaged 11.2 ± 0.04 cm. The length of the base of the skull of boys was on average 15.1 ± 0.13 cm and the width of the base of the skull was on average 15.7 ± 0.12 cm, while in girls these parameters were equal to an average of 13.4 ± 0.10 cm and 14.1 ± 0.10 cm, respectively (Table 3.5.2).

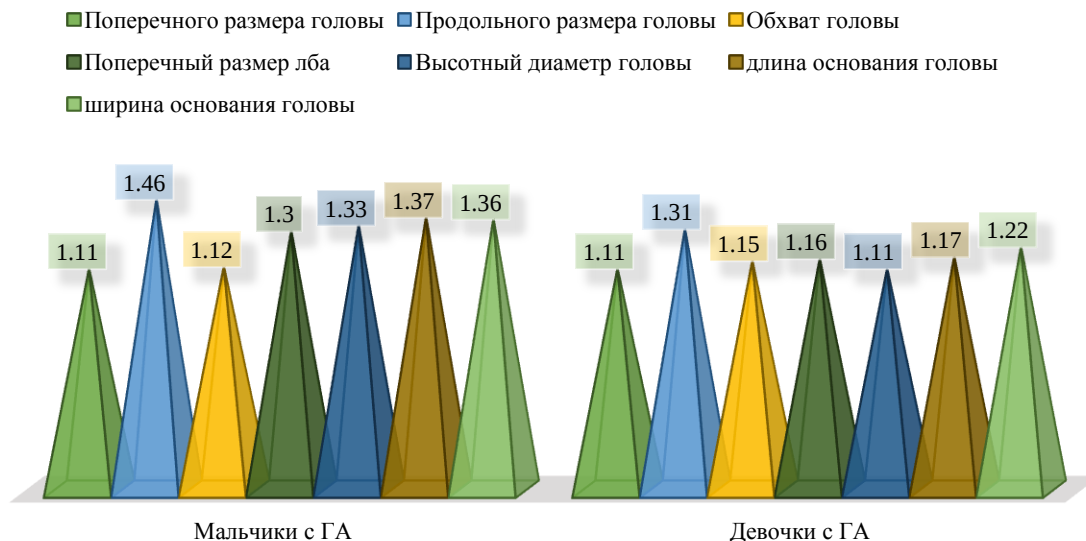


Figure 3.5. Comparative Assessment of Head Parameters in Children with Pharyngeal Tonsil Hypertrophy

Findings. In male children with pharyngeal tonsil hypertrophy, the growth rate of transverse and longitudinal head size was 1.11 and 1.46 times, the highest growth rate was observed at 8 years (2.61%) and 7 years (11.2%) in relation to children of other ages, and the head circumference increased by 1.12 times, the growth rate was observed at 8 years (4.45%), and the transverse size of the forehead and the height diameter of the head increased by 1.30 and 1.33 times. The increase was 7.13% and 1.72% (4 years), respectively. The growth rate of the length and width of the base of the head increased by 1.37 and 1.36 times, and the growth rate was observed at 6 years (7.63%) and 4 years (9.06%) similarly.

In female children, the growth rate of transverse and longitudinal head size was 1.11 and 1.31 times, the maximum growth rate was observed at 4 years (5.10%) and 7 years (6.34%) in relation to children of other ages, and the head circumference was equal to 1.15 times, the highest growth rate

was observed at 8 years (4.68%), and the transverse size of the forehead and the height diameter of the head increased by 1.16 and 1.11 times. The increase was at 4 years and 11 years (3.29% and 2.68%), respectively. The growth rate of the length and width of the base of the head was 1.17 and 1.22 times, and the growth rate was observed at 10 years (6.82%) and 4 years (6.48%) similarly (Fig. 3.5).

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