Comparative Analysis of Anthropometric Parameters of the Head of Children with Hypertrophy of Adenoids

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Abstract: Anthropometry in comparison with other research methods has the advantage that it is an inexpensive, easy-to-use and relatively non-invasive method. The limitations of this approach are the need for cooperation, wasting time for data collection. In this study, anthropometric data of healthy children and children with hypertrophy of the pharyngeal tonsils were analyzed and compared. The data obtained show that the proliferation of adenoids to one degree or another affects normal development skulls of a young organism.

Keywords: hypertrophy of adenoids, children, anthropometry of the head, correlation of parameters.

Introduction. To date, all over the world, hypertrophy of the pharyngeal tonsils remains the dominant problem of childhood pathologies aged 3-12 years, the incidence of which is on average 8.5 to 15%. The incidence of this pathology in age periods spreads at different rates, in 2–3% of children aged 3 years, in 6.5% – at the age of 5–6 years, in 12–13% – at the age of 10–12 years and in 25–35% at the age of 18–20 years [7, with. 85-89;].

The most common pathology of childhood is hypertrophy of the adenoids, which causes obstruction of the upper respiratory tract. According to foreign authors, frequently ill children suffer from this pathology 32 to 43 times more than their peers. Gender differences in the prevalence of hypertrophy of the adenoids are of particular importance, in male children the frequency of occurrence of hypertrophy of the pharyngeal tonsils is 2 times lower. [35, p.106-109].

A typical "adenoid face" is characteristic of children with impaired nasal breathing, which is difficult due to large adenoids [38, p.117-125].

Difficulty breathing through the nose, the open position of the oral cavity clearly contributes to a change in the anatomical structures of the ENT organs and, as a result, children develop an oral type of breathing [15, pp. 5-12].

Rhinophonia, the so-called nasal shade of speech, develops due to the insufficiency of the inclusion of resonator cavities in adenoids leads. This is manifested by the convergence of the lateral parts of the upper jaw, the formation of a narrow Gothic hard palate [49, p.28; 76, p.3].

In children, as a result of mouth breathing, an open type of mouth and a lower location of the tongue develop, as a result, it lags behind in the development of maxilla. In turn, due to the pathology in the development of the lower jaw, the child develops a stoop and deterioration of physiological respiration, and for the same reason, children with pathology of the nasopharyngeal ring develop an anterior position of the head, that is, the tilt and extension of the head forward relative to the vertical of the spinal column [15, p. 5-12; 120, p.451-458].

In most cases, children with such symptoms have a tilt of the head to the frontal plane, deviation of the chest on the lateral projection, a decrease in size, pathological angles of the ribs, non-physiological dimensions of the scapula, uneven borders of the abdomen, as well as varus or valgus of the legs, as well as flat feet [25, p.210-213].

For many years, the direct method of anthropometry has been used to study the morphology of the face. This approach has been applied to the study of facial growth for and comparison of the phenotype of patients [38, p. 117-125; 39, p. 22].

Anthropometry in comparison with other research methods has the advantage that it is an inexpensive, easy-to-use and relatively non-invasive method. The limitations of this approach are the need for cooperation, wasting time for data collection [73, p.39-43].

Despite numerous studies of comparisons of the nasopharyngeal space in patients with sagittal dysplasia, the relationship between the nasopharyngeal space and the shape of the face has been carried out so far [124, p.500-508].

Due to the need to identify new evidence that contributes to the solution of this problem, such as composite and sagittal dysplasia, no studies have yet been conducted on the relationship between the nasopharyngeal space and the shape of the face [18, p.159].

Children with hypertrophy of the pharyngeal tonsils are characterized by an elongated type of face, a half-open position of the mouth, flaccid folds of the nasolabial angles and wings of the nasal cavity [14, p. 1643-1645].

Of the complications outside the dentoalveolar system of oral respiration, one can note the deterioration of blood flow in the veins of the sinuses of the brain and pathology from the central nervous system, the latter are complicated by an increase in eye and cranial pressure [44, p. 195-199].

Due to the increase in the height of the front of the face, nasal congestion occurs, which is caused by chronic breathing through the mouth [9, p.23; 10, p. 104-107]. In people with nasal congestion, the height of the anterior part of the face increases with aging [29, p.45-5]. They also proved that the height of the front of the face does not depend on other skeletal units, but depends only on factors that affect the position of the lower jaw, such as breathing through the mouth [104, p.184-190].

Materials and methods. 421 children with adenoids (218 boys, 203 girls) were examined, the age of the studied children ranged from 3 to 11 years. Anthropometric studies of children were carried out according to the methodological recommendations of Shomirzaeva N.Kh. et al. [1998], Negasheva M.A. [2017]. The study of morphometric parameters of the children's skull was studied according to 7 parameters:

➢ a centimeter tape applying horizontally between the glabella and the external occipital tubercle is measured - the girth of the head;

➢ inserting one end of the tazomer on the epilithium, the other end on the external occipital tubercle measures the longitudinal diameter of the head;

➢ by inserting a tazometer between the parietal tubercles, the transverse size of the head is measured;

➢ to measure the altitude diameter of the head, the tazometer is placed at the junction of the frontal bone and parietal bones;

➢ By placing the tazometer between the most lateral points of the frontal bone, the transverse size of the forehead is measured.

➢ by installing a tazometer between the nasion and the opistonium, the length of the base of the head is measured;

➢ By installing the tazomer between the left and right root of the zygomatic process of the temporal bone, the width of the base of the head is measured.

Statistical analysis was carried out with the help of well-known statistical techniques and applications. The collected data were corrected, after systematizing the initial materials, the Microsoft Office Excel 2010 spreadsheet program was used to obtain significant results. All data were subjected to statistical analysis using IBM SPSS Statistics v.23 (developed by IBM Corporation, USA).

In order to describe the sample distribution of quantitative features that do not obey the normal distribution, the arithmetic mean (M) and the standard error (m) were used, in the format M±m and the boundaries of the 95% confidence interval (95% CI).

When comparing mean values in normally distributed sets of quantitative data, the Student's t-test was calculated. The obtained values of the Student's t-test were estimated by comparison with critical values. The differences in indicators were considered statistically significant at the significance level $p<0.05$. The χ 2 test was also usedPearson, which allows us to assess the significance of the difference between the actual number of outcomes or qualitative characteristics of the sample falling into each category and the theoretical number that can be expected in the studied groups if the null hypothesis is valid. When organizing and conducting research, the principles of evidence-based medicine were used.

Results and discussions. In the course of studying the anatomical parameters of the head of children of both sexes, the following data were revealed: The results show that in 3-year-old male children, the head circumference was equal to an average of 48.9±0.20 cm, and in girls it averaged 48.5±0.20 cm. In male children, the longitudinal diameter of the head averaged 9.6±0.10 cm, and in females it averaged 9.60±0.20 cm. The transverse size in boys was equal to an average of 14.3±0.10 cm, in girls averaged 13.7±0.10 cm. When measuring the transverse size of the forehead of the studied male children, the average was 9.1±0.10 cm, in females it was equal to an average of 9.20±0.10 cm. At the same time, the vertical (high-altitude) diameter of the head of boys is on average 9.8±0.10 cm, in girls it averaged 10.1±0.20 cm. In males, the length of the base of the skull is on average 11.1±0.10 cm and the width of the base of the skull is on average equal to - 11.6±0.20 cm, and in females averaged 11.5±0.10 cm and 11.6±0.10 cm, respectively.

The indicators of 4-year-old children practically did not differ from those of 3-year-olds (P>0.05), practically repeating the above parameters. The circumference of the head in 4-year-old male children averaged 48.8±0.10 cm, and in females it was equal to an average of 48.6±0.01 cm. In boys, the longitudinal diameter of the head averaged 9.7±0.10 cm, in girls it averaged 9.80±0.03 cm. In males, the transverse size of the head was equal to an average of 14.1±0.02 cm, The transverse size of the forehead of boys averaged 9.3±0.10 cm, 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 equal to an average of 11.6±0.10 cm and in girls averaged 11.6±0.10 cm The width of the base of the skull in male children averaged -12.7±0.10 cm, in females on average -12.4±0.10 cm

In children by the age of 5, there were insignificant but significant increases in size in relation to 3- and 4-year-old children (P<0.05). The circumference of the head of these male children was equal to an average of 49.8±0.10 cm, in females averaged 49.6±0.20 cm. The longitudinal diameter of the head of boys averaged 10.5±0.10 cm, in girls it was equal to an average of 10.0±0.03 cm. The transverse size of the head in males averaged 14.4±0.10 cm, in females it averaged 14.4±0.04 cm. In malchiks, the transverse size of the forehead averaged 10.0±0.10 cm, In girls, it was equal to an average of 9.60±0.10 cm. The vertical diameter of the head in males averaged 10.9±0.10 cm, in females it was equal to an average of 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 equal to 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. In male children by the age of 6, the head circumference averaged 49.4±0.10 cm, in girls it was equal to an average of 51.7±0.10 cm. The longitudinal diameter of the head in males was equal to an average of 11.0±0.10 cm, and in females averaged 10.5±0.10 cm. In boys, the transverse size of the head averaged 14.7±0.10 cm, The transverse size of the forehead in males was equal to an average of 1±0.2±0.10 cm, in females averaged 9.90±0.04 cm. In male children, the vertical diameter of the head averaged 11.1±0.02 cm and in females averaged 10.4±010 cm, respectively. The length of the base of the skull in male children averaged 13.1±0.10 cm and in females was equal to an average of 12.5±0.10 cm. The width of the base

of the skull averaged -13.9±0.10 cm and 12.7±0.10 cm, respectively. In male children by the age of 6, the head circumference averaged 49.4±0.10 cm, in girls it was equal to an average of 51.7±0.10 cm. The longitudinal diameter of the head in males was equal to an average of 11.0±0.10 cm, and in females averaged 10.5±0.10 cm. In boys, the transverse size of the head averaged 14.7±0.10 cm, The transverse size of the forehead in males was equal to an average of 1±0.2±0.10 cm, in females averaged 9.90±0.04 cm. In male children, the vertical diameter of the head averaged 11.1±0.02 cm and in females averaged 10.4±010 cm, respectively. The length of the base of the skull in male children averaged 13.1±0.10 cm and in females was equal to an average of 12.5±0.10 cm. The width of the base of the skull averaged -13.9±0.10 cm and 12.7±0.10 cm, respectively.

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

The size of the head averaged 14.9±0.03 cm, the female sex was equal to an average of 14.7±0.04 cm. The transverse size of the forehead in boys averaged 10.4±0.1 cm, in girls it was equal to an average of 10.0±0.04 cm. In male children, the vertical diameter of the head was equal to an average of 11.3±0.10 cm, in females it averaged 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 in girls averaged 12.1±0.10 cm and 13.5±0.10 cm, respectively (Table 1.)

Table 1. Anthropometric indicators of the head of children 3-7 years old with hypertrophy of the pharyngeal tonsils

Age	3 – flight		4 – flight		5-flight		6-flight		7-flight	
Floor	M	D	M	D	M	D	M	D	M	D
HRP	13,4-15,0 14,3±0,11	12,6-14,4 13,7±0,12	13,7-14,5 14,1±0,05	13,7-15,3 14,4±0,01	13,4-15,3 14,4±0,01*	13,9-14,9 14,4±0,0,08	13,8-15,5 14,7±0,1	13,5-15,2 14,5±0,1	14,4-15,3 14,9±0,0	13,7-15,5 14,5±0,1
PrDCH	8,8-10,2 9,6±0,1	6,6-10,4 9,6±0,2	8,1-11,6 9,7±0,1*	9,4-10,3 9,8±0,0	8,7-12,4 10,5±0,1*	9,4-10,4 10,0±0,0*	9,8-12,6 11,0±0,1*	9,5-11,4 10,5±0,1*	11,4-13,3 12,4±0,1*	10,7-11,6 11,2±0,0*
OG	46,5-51,2 48,9±0,2	45,7-51,2 48,5±0,2	47,2-50,3 48,8±0,1	46,8-50,3 48,6±0,1	48,3-51,3 49,8±0,1	47,0-52,2 49,6±0,2*	48,0-50,8 49,4±0,1	49,9-53,5 51,7±0,1*	47,8-55,2 51,5±0,3	48,0-55,7 51,9±0,3*
PDL	8,1-9,8 9,1±0,1	7,8-11,0 9,2±0,1	7,3-10,8 9,3±0,1*	8,8-10,4 9,5±0,1*	8,6-11,3 10,0±0,1*	8,7-10,6 9,6±0,1*	9,1-11,0 10,2±0,1*	9,5-10,4 9,9±0,0*	9,6-11,4 10,4±0,1*	9,6-10,5 10,0±0,0*
WRG	8,8-10,5 9,8±0,1	7,4-13,0 10,1±0,2	8,4-11,8 10,2±0,1*	8,8-11,0 10,0±0,1	9,6-12,2 10,9±0,1	9,6-10,6 10,2±0,0	10,6-11,5 11,1±0,0	9,4-11,3 10,4±0,1*	10,2-12,2 11,3±0,1*	9,6-11,3 10,5±0,1*
DAUGHTER	9,7-12,4 11,1±0,1	9,8-13,2 11,5±0,1	10,2-13,0 11,6±0,1*	9,9-13,3 11,6±0,1*	11,0-13,2 12,1±0,1*	10,5-13,5 12,0±0,1*	11,5-14,7 13,1±0,1*	10,7-14,2 12,5±0,1	11,9-15,2 13,6±0,1*	10,9-13,2 12,1±0,1
SHOCH	9,2-13,9 11,6±0,2	10,0-13,1 11,6±0,1	11,0-14,4 12,7±0,1*	10,8-13,9 12,4±0,1*	11,3-14,1 12,7±0,1*	11,2-14,0 12,6±0,1*	12,0-15,7 13,9±0,1*	11,3-14,0 12,7±0,1*	12,7-15,2 14,0±0,1*	12,2-14,7 13,5±0,1*

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

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 in boys the head circumference averaged 53.9±0.20 cm, and in girls it was equal to an average of 54.1±0.20 cm. The longitudinal diameter of the head of male children averaged 13.3±0.08 cm, in females it was equal to an average of 11.6±0.10 cm. The transverse size of the head in males averaged 15.3±0.04 cm, in females it was equal to an average of 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 equal to an average of 11.5±0.08 cm, in girls averaged 10.6±0.10 cm. The length of the base of the skull in males averages 14.1±0.13 cm and the width of the base of the skull averages 14.6±0.09 cm. The length of the base of the skull in females averages 12.4±0.10 cm and the width of the base of the skull averages -13.6±0.10 cm.

The trend of gradual increase in head size continued in 9-year-old children of both sexes. In male children, the circumference of the head is on average 53.8±0.18 cm, in females it averaged 54.3±0.20 cm. in males, the longitudinal diameter of the head averaged 13.5±0.07 cm, in females it was equal on average - 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 equal to an average - 14.7±0.07 cm. The transverse size of the forehead of boys averaged 15.6±0.08 cm, in girls it was equal to an average of -10.2±0.06 cm, The vertical diameter of the head averages 11.9±0.04 cm and 10.8±0.04 cm, respectively. In males, the length of the base of the skull was equal to an average of 14.4±0.12 cm, in females it averaged 12.3±0.10 cm and the width of the base of the skull averaged -14.8±0.09 cm and 13.6±0.10 cm, respectively.

The data obtained showed that in 10-year-old male children, the head circumference is on average 54.0±0.23 cm, in females it averaged 52.4±0.23 cm. The longitudinal diameter of the head in boys is on average 13.7±0.08 cm, in girls it averaged 12.2±0.04 cm. In males, the transverse size of the head was equal to an average of 14.2±0.10 cm, in females averaged 14.8±0.04 cm. In male children, the transverse size of the forehead averaged 15.7±0.04 cm, in females averaged 10.4±0.04 cm. In males, the vertical diameter of the head was equal to an average of 12.5±0.04 cm, in females it averaged 10.9±0.09 cm. The length of the base of the skull in boys was equal to an average of 14.7±0.12 cm and the width of the base of the skull averaged -15.4±The length of the base of the skull in girls was equal to an average of 13.2±0.10 cm and the width of the base of the skull averaged -14.0±0.10 cm.

Table 2. Anthropometric indicators of the head of children 8-11 years old with hypertrophy of the pharyngeal tonsils

Age	8 – flight		9 – flight		10-flight		11-flight	
Floor	M	D	M	D	M	D	M	D
HRP	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*
PrDCH	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*

WRG	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*
DAUGHTER	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*
SHOCH	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: *-confidence score (P<0.05) compared to the previous age.

Facial parameters in 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 3-7 years old (P<0.05). The circumference of the head in 11-year-old male children averaged 54.5±0.28 cm, in females averaged 55.5±0.27 cm. The longitudinal diameter of the head averaged 13.9±0.03 cm in boys, and an average of 12.6±0.04 cm in girls. In males, the transverse size of the head averaged 15.9±0.04 cm, in females it averaged 15.2±0.08 cm. The transverse size of the forehead in boys was equal to an average of 11.8±0.04 cm, In girls, the average was 10.7±0.08 cm. In male children, the vertical diameter of the head was equal to an average of 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 equal to an average of 15.1±0.13 cm and the width of the base of the skull was on average -15.7±0.12 cm, and in girls these parameters were equal on average - 13.4±0.10 cm and 14.1±0.10 cm, respectively (Table 2).

In children with hypertrophy of the pharyngeal tonsil, the growth rate of the transverse and longitudinal size of the head 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 circumference of the head increased by 1.12 times, the growth rate was observed at 8 years (4.45%), also the transverse size of the forehead and the high-altitude 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.

When analyzing the data obtained, a correlation of cephalometric parameters of children of different strength was revealed.

In healthy children of 3 years of age, there was a strong correlation between the longitudinal diameter of the head and the circumference of the head (r = 0.80), and in children with adenoids, the average relationship between the physiognomic and morphological heights of the face, with the height of the nose (r = 0.51-0.59), as well as the interorbital width and diameter of the lower jaw, zygomatic diameter (r = 0.38-0.49) was revealed.
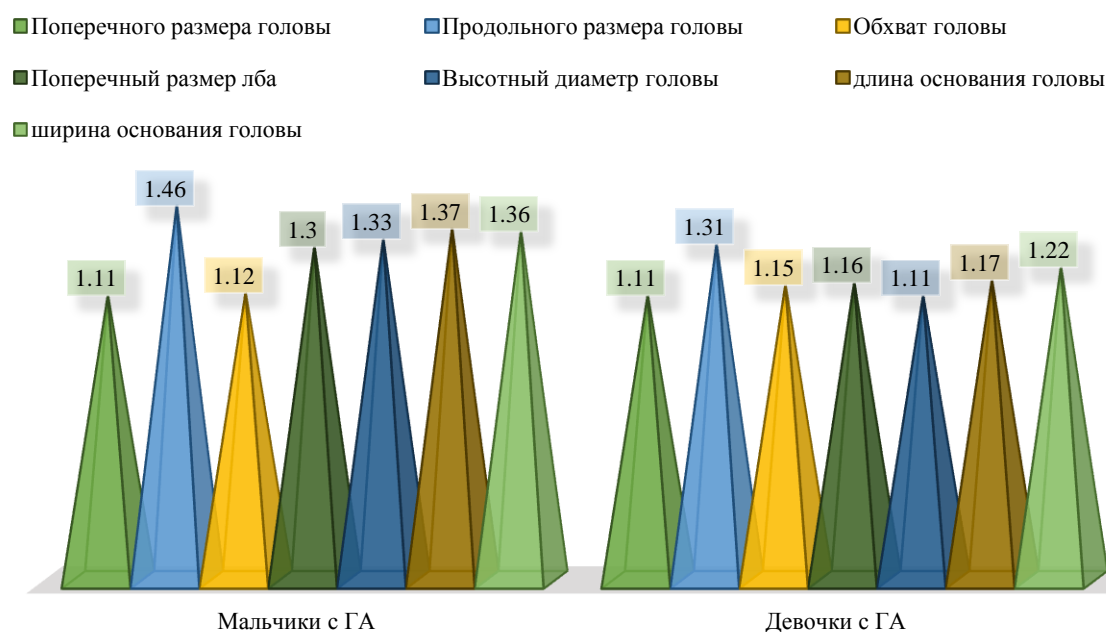
Figure 3. 5. Comparative assessment of head parameters of children with pharyngeal tonsil hypertrophy

In 4-year-old children with hypertrophy of the pharyngeal tonsil, a moderate correlation was found between the transverse diameter of the head and the circumference of the head, zygomatic and mandibular width (r = 0.56-0.70); And in practically healthy children, the physiognomic and morphological heights of the face are associated with an average correlation with the longitudinal diameter of the head (r = 0.26-0.43)

In 5-year-old healthy children, the height of the nose is associated with an average correlation with the height of the mucous membrane of the lips, the morphological height of the face and the diameter of the lower jaw are weakly related to the zygomatic and external orbital width, (r = 0.510.61), in children with the growth of adenoids, there was a moderate correlation with the longitudinal and transverse diameters of the head, the physiognomic height of the face, the width and height of the nose (r = 0.340.49).

In 6-year-old children with adenoid hypertrophy, the head circumference had a strong correlation with the longitudinal diameter of the head (r = 0.80), and a moderate relationship was observed in children of the control group between the transverse diameter of the head, forehead height, physiognomic and morphological heights of the face (r = 0.70, 56).

A strong correlation was found between physiognomic height and head circumference at 7 years of age in children in the control group, and in children with adenoids, a strong correlation was observed between the height and width of the nose, as well as the zygomatic and mandibular diameters (r = 0.530.70), but a moderate correlation was found between the transverse diameter of the head and the height of the forehead (r = 0.350.50).

In 8-year-old children with adenoid hypertrophy, forehead height is strongly related to the morphological height of the face, head circumference (r=0.750.90), in children of the control group, an average correlation of head circumference with the longitudinal diameter of the head, height of the nose and lips, physiognomic height of the face, zygomatic and mandibular diameter (r=0.590.72) was revealed.

In 9-year-old healthy children, the morphological height of the face forms an average correlation only with the physiognomic height of the face (r = 0.54). In children with overgrowth of adenoids, weak connections between the interzygomatic and mandibular diameters (r=0.190.11).

In children of 10 years of age with hypertrophy of adenoids, the physiognomic height of the face is associated with an average correlation with head circumference, the width of the nose and morphological heights of the face, zygomatic width and height of the nose (r = 0.510.73). In healthy children

Moderate relationships were found with the longitudinal and transverse diameters of the head, mandibular width.

In practically healthy children of 11 years of age, the morphological height of the face is associated with a strong correlation only with the transverse size of the forehead (r = 0.360.41). A medium-strong correlation was found with head circumference, longitudinal head diameter, zygomatic diameter and jaw width. In children with adenoids, a strong correlation was found linking the studied parameter of the morphological height of the face with the physiognomic height of the face, the width of the lower jaw (r = 0.510.72).

Conclusions: In female children, the growth rate of the transverse and longitudinal size of the head 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 girth of the head was equal to 1.15 times, the highest growth rate was observed at 8 years (4.68%), also the transverse size of the forehead and the altitudinal 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. 1).

Thus, the cephalometric parameters of children 3-11 are interconnected by correlations of different strength and direction. In practically healthy children, strong correlations were found between the circumference of the head and its longitudinal diameter; the morphological height of the face and the height of the lower part of the face, the depth of the face and the height of the branch of the lower jaw; and children with adenoids between the zygomatic and jaw widths; the depth of the face and the length of the body of the lower jaw; heights of the body and branches of the lower jaw and body length of the lower jaw (r=0.750.90).

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