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Results of Anthropometric Examinations of the Maxillofacial Region of Children 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.

Key words: 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. 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].

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].

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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].

Results. The study of facial parameters in 3-year-old male children showed that the zygomatic diameter was on average 81.0±0.11 mm, in the female sex was equal to an average of 7.70±0.10 cm. The mandibular diameter of boys was on average 5.60±0.10 cm, in girls it was on average 5.50±0.10 cm. In male children, the morphological height of the face was on average 16.0±0.10 cm. The average physiognomic height of the face in boys was ±10.0±0.10 cm, in girls it was 10.99±0.10 cm. In male children, the height of the nose was on average 27.4±0.70 cm, in women it was 26.5±0.50 cm. The width of the boys' nose was 24.7±0.40 cm on average. ±The external orbital width in males averaged 83.7±0.30 cm, in females was 79.3±0.20 cm, and the interorbital width averaged 24.3±0.30 cm and 20.7±0.40 cm, respectively. In males, the height of the mucous membrane of the lips was on average 14.2±0.30 cm, in females it was on average 15.7 = 1±0.30 cm, the width of the mouth of boys was on average 34.0±0.50 cm, in girls it was on average -31.1±0.50 cm

Almost very similar results were obtained in 4-year-old children, in boys the zygomatic diameter was on average 7.80±0.10 cm, and in girls it was equal to an average of 8.30±0.10 cm, and the mandibular diameter in boys is on average 5.60±0.04 cm, in girls it is equal to an average of 6.10±0.10 cm, respectively. The morphological height of the face is on average 10.9±0.10 cm for boys and 11.8±0.10 cm for girls. The physiognomic height of the face in boys is on average 16.5±0.10 cm, in girls on average - 16.4±0.10 cm. The height of the nose in boys on average is 28.9±0.70 cm. in girls on average 3.79±0.11 cm, the width of the nose in boys on average is 25.2±0.40 cm, in girls on average - 22.5±0.30 cm. The average external orbital width is 84.8±0.12 cm for boys, 90.2±0.70 cm for girls, 26.1±0.50 cm for boys on average, 21.9±0.40 cm for girls, 16.3±0.30 cm for boys, 14.9±0.20 cm for girls, 27.6±0.05 cm for boys, For girls, the average is 31.4±0.50 cm

In 5-year-old male and female children, there were slight but significant increases in size in relation to 3- and 4-year-old boys and girls ($P<0.05$). Studies have shown that the zygomatic diameter in male children is on average 8.10±0.10 cm, in female children on average 8.30±0.10 cm, the mandibular diameter in male children is on average 5.80±0.05 cm, In female children, the average is 6.30±0.10 cm. The morphological height of the face in male children is on average 11.3±0.10 cm, in female children on average - 11.9±0.10 cm. The physiognomic height of the face in male children is on average 16.6±0.10 cm, in female children on average - 16.5±0.10 cm. The height of the nose in male children is on average 31.8±0.70 cm, in female children on average 32.1±0.80 cm The width of the nose in male children is on average 27.4±0.40 cm, in female children on average - 23.3±0.30 cm External orbital width in male children 88.7±0.20 cm on average, 87.9±0.20 cm in female children; the interorbital width in males averages 30.3±0.70 cm, and in females averages 23.9±0.11 cm; the

height of the mucous part of the lips in male children is on average 18.5±0.30 cm, in female children on average - 16.7±0.30 cm; mouth width in males is 37.1±0.60 cm in females on average - 34.0±0.60 cm

In 6-year-old male and female children, both facial parameters were significantly higher than the same indicators of 3- and 4-year-old children (P<0.05) and 1 parameter significantly higher (except for zygomatic diameter) in relation to 5-year-old boys and girls. Theresults were as follows: the zygomatic diameter in male children is on average 8.50±0.10 mm, in females, the average is 8.6±0.1 mm; The mandibular diameter in male children is on average 7.69±0.10 mm, in female children on average 6.5±0.1 mm. The morphological height of the face in male children is on average 6.20±0.10 mm, in female children on average - 16.7±0.0 mm. The physiognomic height of the face in male children is on average 11.0±0.04 mm, in female children on average - 10.5±0.0 mm. The height of the nose in male children is on average 35.5±0.70 mm, in female children on average - 36.8±0.8 mm. The width of the nose in male children is on average 29.7±0.40 mm, 24.2±0.3 mm in females, 89.8±0.30 mm in males and 91.6±0.2 mm in females; interorbital width in males is 32.2±0.60 mm on average, and 26.7±0.5 mm in females; the height of the mucous part of the lips in male children is on average 19.8±0.30 mm, in female children on average - 17.6±0.2 mm; The width of the mouth in male children is on average 39.9±0.70 mm, and in female children on average it is 38.1±0.5 mm.

The measurements showed that 7-year-old boys and girls had the same trend of change as 6-year-olds. Studies of facial parameters in 7-year-old boys and girls have shown that the zygomatic diameter in boys is on average 8.60±0.10 cm, in girls on average 8.70±0.10 cm, the mandibular diameter in boys on average is 6.70±0.10 cm.

The average facial height for girls is 6.70±0.04 cm. The morphological height of the face is 11.8±0.10 cm for boys on average, and 12.3±0.10 cm for girls on average.

Table 3.6.1. Anthropometric parameters of the face of boys and girls aged 3-7 years with hypertrophic pharyngeal tonsil

Age	Floor	SD	LFD	International Flights	FVL	EXT	SN	NGS	MGS	VG	SHG
3 – Flight	M	7,9-8,5 8,1±0,02	4,9-6,6 5,6±0,1	15,1-17,3 16,0±0,1	9,2-10,7 10,0±0,1	19,2-35,6 27,4±0,7	19,7-29,7 24,7±0,4	80,3-87,1 83,7±0,3	16,7-31,9 24,3±0,6	9,9-18,4 14,2±0,3	28,0-39,9 34,0±0,5
	D	6,0-9,0 7,7±0,15	4,3-7,4 5,5±0,1	15,8-17,3 16,5±0,1	8,7-12,2 10,9±0,1	20,7-32,3 26,5±0,5	18,4-25,4 21,9±0,3	76,4-82,1 79,3±0,2	15,2-26,2 20,7±0,4	11,6-19,7 15,7±0,3	24,7-37,4 31,1±0,5
4 – Flight	M	7,0-8,5 7,8±0,1	4,9-6,1 5,6±0,0	9,8-11,9 10,9±0,1	14,9-18,1 16,5±0,1*	19,8-38,0 28,9±0,7*	19,9-30,4 25,2±0,4*	82,1-87,4 84,8±0,2*	19,8-32,4 26,1±0,5*	12,4-20,1 16,3±0,3*	27,6-27,6 27,6±0,0
	D	7,3-9,1 8,3±0,1*	4,4-7,1 6,1±0,1*	10,7-12,9 11,8±0,1	14,8-18,0 16,4±0,1*	20,7-39,7 30,2±0,8*	18,9-26,0 22,5±0,3*	81,3-99,0 90,2±0,7	16,3-27,4 21,9±0,4*	11,9-17,8 14,9±0,2	24,8-37,9 31,4±0,5*
5 – Flight	M	7,2-9,1 8,1±0,1*	5,4-6,2 5,8±0,0	9,9-12,6 11,3±0,1	15,2-18,0 16,6±0,1	22,7-40,8 31,8±0,7*	22,3-32,4 27,4±0,4*	86,2-91,2 88,7±0,2*	21,3-39,2 30,3±0,7*	14,6-22,4 18,5±0,3*	29,1-45,0 37,1±0,6*
	D	7,4-9,4 8,3±0,1*	5,4-7,3 6,3±0,1*	10,8-13,0 11,9±0,1*	15,2-17,8 16,5±0,1	22,4-41,8 32,1±0,8*	19,4-27,2 23,3±0,3*	85,4-90,4 87,9±0,2	19,4-28,3 23,9±0,4*	12,8-20,5 16,7±0,3*	25,9-42,1 34,0±0,6*
6 – Flight	M	7,6-9,4 8,5±0,1*	5,5-7,2 6,2±0,1*	14,9-17,9 16,7±0,1	10,5-11,4 11,0±0,07	26,1-44,8 35,5±0,7*	25,2-34,2 29,7±0,4*	86,4-93,2 89,8±0,3*	24,2-40,1 32,2±0,6*	15,9-23,7 19,8±0,3*	30,7-49,1 39,9±0,7*
	D	7,5-9,2 8,6±0,1*	5,6-7,5 6,5±0,1	16,2-17,2 16,7±0,0	9,9-11,0 10,5±0,02	26,7-46,9 36,8±0,8*	19,9-28,4 24,2±0,3*	89,3-93,8 91,6±0,2*	20,2-33,1 26,7±0,5*	14,6-20,6 17,6±0,2*	31,7-44,4 38,1±0,5*
7 - Flight	M	7,8-9,7 8,6±0,1*	5,7-7,7 6,7±0,1*	10,1-13,4 11,8±0,1	16,4-18,7 17,5±0,1*	26,8-45,7 36,3±0,8*	27,1-37,1 32,1±0,4*	89,2-99,3 94,3±0,4*	26,7-47,5 37,1±0,8*	19,8-24,6 22,2±0,2*	34,7-50,0 42,4±0,6*
	D	7,8-9,6 8,7±0,1	6,2-7,2 6,7±0,0	11,2-13,3 12,3±0,1	16,7-19,3 18,0±0,1	28,3-49,7 39,0±0,9	21,3-32,3 26,8±0,4*	91,0-98,9 95,0±0,3*	24,8-35,2 30,0±0,4*	15,0-23,4 19,2±0,3*	32,0-45,9 39,0±0,6*

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

The physiognomic height of the face in boys is on average 17.6±0.10 cm, in girls on average - 18.0±0.10 cm. The height of the nose in boys is on average 36.3±0.80 cm, in girls on average 39.0±0.90 cm. The average width of the nose is 32.1±0.40 cm for boys, 26.8±0.40 cm for girls. The average width of the outer orbital width is 94.3±0.40 cm for boys, 95.0±0.30 cm for girls, the average interorbital width for boys is 37.1±0.80 cm±, and the average height of the mucous membrane of the lips for boys is 22.2±0.20 cm. The average mouth width for girls is 19.2±0.30 cm, the width of the mouth for boys is 42.4±0.60 cm, and for girls it is 39.0±0.60 cm on average.

The measurements showed that 8-year-old boys and girls had the same trend of change as 7-year-olds. Studies of facial parameters in 8-year-old boys showed that the zygomatic diameter in boys is on average 8.60±0.08 cm, in girls it is on average 8.8±0.0 cm; The mandibular diameter is on average 7.00±0.03 cm for boys and 7.1±0.0 cm for girls on average. The morphological height of the face in boys is on average 12.3±0.10 cm, in girls on average - 12.4±0.1 cm. The physiognomic height of the face in boys is on average 17.6±0.09 cm, in girls on average - 17.8±0.1 cm. The height of the nose in boys is on average 38.7±0.82 cm, in girls on average - 39.0±0.7 cm. The width of the nose in boys is on average 33.9±0.36 cm. In girls, the average is 29.3±0.3 cm. The external orbital width in boys is 95.3±0.42 cm on average, in girls on average – 96.1±0.3 cm; interorbital width in boys on average - 38.9±0.80 cm, in girls on average - 40.3±0.2 cm; the height of the mucous part of the lips in boys is on average 22.9±0.20 cm, in girls on average - 21.3±0.5 cm; The width of the mouth in boys is on average 45.5±0.50 cm, in girls on average - 41.1±0.5 cm. Studies of facial parameters in 9-year-old male and female children have shown that the zygomatic diameter in male children is on average 8.81±0.08 cm, in female children on average - 8.90±0.04 cm; and the mandibular diameter varied from 7.6 to 10.0 cm, in males on average - 7.2±0.03 cm, in females on average - 7.10±0.04 cm. The morphological height of the face in male children is on average 16.8±0.04 cm, in female children on average - 17.1±0.04 cm±. In females, the average height is 11.4±0.04 cm. The height of the nose in male children is on average 41.3±0.76 cm, in female children on average 42.2±0.90 cm. The width of the nose in male children is on average 35.5±0.33 cm, in female children on average - 31.8±0.30 cm±. 99.3±0.20 cm on average for female children; the interorbital width in males is 39.2±0.80 cm on average, and 41.8±0.20 cm in females; the height of the mucous part of the lips in male children is on average 24.4±0.24 cm, in female children on average - 23.8±0.50 cm; The width of the mouth in male children is on average 52.30±0.04 cm, in female children on average - 44.9±0.40 cm.

The facial size of 10-year-old boys and girls was almost at the level of 8- and 9-year-old male and female children, the results of which did not differ significantly ($P>0.05$), significant changes were noted in comparison with boys and girls of 3-7 years ($P<0.05$). In 10-year-old boys , the zygomatic diameter averaged 8.90±0.04 cm, in girls on average - 9.00±0.03 cm. At the same time, the mandibular diameter in boys was on average 7.21±0.03 cm, in girls on average - 7.29±0.04 cm. The morphological height of the face in boys on average is 12.4±0.1 cm, in girls on average - 12.5±0.09 cm. The physiognomic height of the face in boys is on average 17.9±0.08 cm, in girls on average - 18.2±0.09 cm. The height of the nose in boys is on average 43.4±0.76 cm. The average width of the nose is ±36.1±0.38 cm for boys and 35.1±0.26 cm for girls.

The external orbital width is 96.8±0.11 cm for boys on average and 101.4±0.19 cm for girls on average; interorbital width in boys on average - 40.0±0.08 cm, in girls on average - 44.4±0.24 cm; mucosal height

Table 3.6.2. Anthropometric parameters of the face of boys and girls aged 8-11 years with hypertrophic pharyngeal tonsil

Age / Floor	8 – Flight		9– Flight		10 – flight		11 – flight	
	M	D	M	D	M	D	M	D
SD	7,9-8,5 8,1±0,02	6,0-9,0 7,7±0,15	7,0-8,5 7,8±0,1	7,3-9,1 8,3±0,1*	7,2-9,1 8,1±0,1*	7,4-9,4 8,3±0,1*	7,6-9,4 8,5±0,1*	7,5-9,2 8,6±0,1*
LFD	4,9-6,6 5,6±0,1	4,3-7,4 5,5±0,1	4,9-6,1 5,6±0,0	4,4-7,1 6,1±0,1*	5,4-6,2 5,8±0,0	5,4-7,3 6,3±0,1*	5,5-7,2 6,2±0,1*	5,6-7,5 6,5±0,1
International Flights	15,1-17,3 16,0±0,1	15,8-17,3 16,5±0,1	9,8-11,9 10,9±0,1	10,7-12,9 11,8±0,1	9,9-12,6 11,3±0,1	10,8-13,0 11,9±0,1 *	14,9-17,9 16,7±0,1	16,2-17,2 16,7±0,0
FVL	9,2-10,7 10,0±0,1	8,7-12,2 10,9±0,1	14,9-18,1 16,5±0,1 *	14,8-18,0 16,4±0,1 *	15,2-18,0 16,6±0,1	15,2-17,8 16,5±0,1	10,5-11,4 11,0±0,0	9,9-11,0 10,5±0,0
EXT	19,2-35,6 27,4±0,7	20,7-32,3 26,5±0,5	19,8-38,0 28,9±0,7	20,7-39,7 30,2±0,8	22,7-40,8 31,8±0,7	22,4-41,8 32,1±0,8	26,1-44,8 35,5±0,7	26,7-46,9 36,8±0,8

			*	*	*	*	*	*
SN	19,7-29,7 24,7±0,4	18,4-25,4 21,9±0,3	19,9-30,4 25,2±0,4 *	18,9-26,0 22,5±0,3 *	22,3-32,4 27,4±0,4 *	19,4-27,2 23,3±0,3 *	25,2-34,2 29,7±0,4 *	19,9-28,4 24,2±0,3 *
NGS	80,3-87,1 83,7±0,3	76,4-82,1 79,3±0,2	82,1-87,4 84,8±0,2 *	81,3-99,0 90,2±0,7	86,2-91,2 88,7±0,2 *	85,4-90,4 87,9±0,2	86,4-93,2 89,8±0,3 *	89,3-93,8 91,6±0,2 *
MGS	16,7-31,9 24,3±0,6	15,2-26,2 20,7±0,4	19,8-32,4 26,1±0,5 *	16,3-27,4 21,9±0,4 *	21,3-39,2 30,3±0,7 *	19,4-28,3 23,9±0,4 *	24,2-40,1 32,2±0,6 *	20,2-33,1 26,7±0,5 *
VG	9,9-18,4 14,2±0,3	11,6-19,7 15,7±0,3	12,4-20,1 16,3±0,3 *	11,9-17,8 14,9±0,2	14,6-22,4 18,5±0,3 *	12,8-20,5 16,7±0,3 *	15,9-23,7 19,8±0,3 *	14,6-20,6 17,6±0,2 *
SHG	28,0-39,9 34,0±0,5	24,7-37,4 31,1±0,5	27,6-27,6 27,6±0,0	24,8-37,9 31,4±0,5 *	29,1-45,0 37,1±0,6 *	25,9-42,1 34,0±0,6 *	30,7-49,1 39,9±0,7 *	31,7-44,4 38,1±0,5 *

Note: *-confidence score (P <0.05) compared to previous age parts of the lips in boys on average - 26.1±0.30 cm, in girls on average - 26.7±0.52 cm; The average width of the mouth is 51.8±0.36 cm for boys, and 46.5±0.51 cm for girls.

The facial parameters of 11-year-old boys and girls showed that the zygomatic diameter in male children was on average 8.91±0.08 cm, in female children on average - 9.00±0.04 cm, and the mandibular diameter in male children was on average 7.50±0.07 cm, in female children on average 7.40±0.04 cm. The morphological height of the face in male children is on average 12.5±0.11 cm, in female children on average - 12.8±0.11 cm. The physiognomic height of the face in male children is on average 18.3±0.08 cm, in female children on average - 18.5±0.08 cm. The height of the nose in male children is on average 44.3±0.78 cm, in female children on average 45.3±0.72 cm. The width of the nose in male children is on average 37.3±0.32 cm, In females, the average width is 35.9±0.23 cm, the external orbital width in male children is 101.3±0.15 cm, in females on average, 103.1±0.20 cm; interorbital width in males averages 41.3±0.71 cm, in females averages 45.9±0.25 cm; the height of the mucous part of the lips in male children is on average 27.9±0.20 cm, in female children on average - 27.4±0.52 cm; The width of the mouth in male children is on average 53.1±0.34 cm, in female children on average - 51.5±0.58 cm.

Thus, the growth rate of the zygomatic diameter of the face of boys was 1.09 times, and that of girls was 1.17 times, and the growth rate of this parameter in males was 2.35% (9 years) and in females was 7.23% (4 years).

The growth rate of the mandibular diameter of boys increased by 1.33 times, and in girls it was 1.34 times, the increase was observed in boys at 6 years old (7.46%), and in girls at 4 years (9.67%).

The growth rate of morphological and physiological facial height in boys was 0.78 and 1.84 times, and in girls it was 0.78 and 1.69 times, respectively. The highest growth rates were 4.08 per cent for boys at 8 years of age and 2.18 per cent at 11 years of age compared to the previous age, while these rates were 2.72 per cent for girls and 1.36 per cent at 11 years of age compared to children of the previous age.

In boys, the parameters of the nose (height and width) increased by 1.62 and 1.51 times, and in girls it was 1.71 and 1.64 times, the rate of increase in the height of the nose in males was observed at 9 years (6.53%) and in females at 6 years (7.47%). The rate of increase in nasal width in male children was observed at 4 years of age (8.04%) and in females at 6 years (9.89%). A comparative assessment of the growth rate of children of both sexes is estimated in Figure 3.6.1.

Figure 3.6

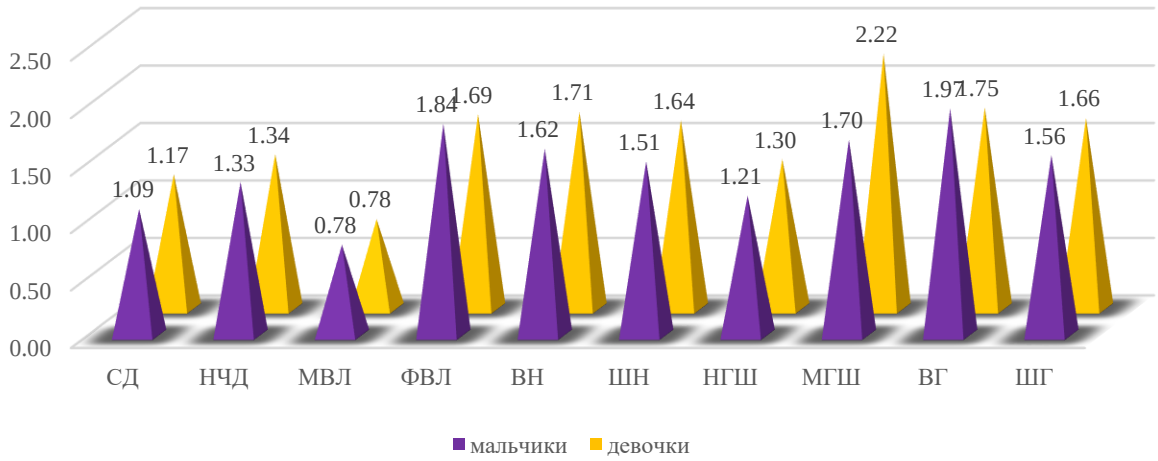

Figure 3.6. Comparative Evaluation of Facial Parameters in Children with Adenoids in the Sexual Aspect

The growth rate of the external orbital width in male children was 1.21 times, and in females it was 1.30 times. The growth rate of the external orbital width in boys at 7 years of age is 4.72% and in girls at 5 years of age 3.99%, respectively.

In boys, the interorbital width increased by 1.70 times, in girls by 2.22 times. The growth rate at 5 years of age was 5.91 per cent for male children and 8.39 per cent for female children at 4 years of age, respectively.

The growth rate of lip height and width in males was 1.97 and 1.56 times, and in females it was 1.75 and 1.66 times, respectively. The growth rate was observed for boys at 10 years (6.69%) and 5 years (7.14%), for girls at 8 years (9.65%) and 11 years (9.71%).

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