

Morphometric Indicators of Head Sizes in Healthy Boys

Khaitova Dildora Sharipboevna

Bukhara State Medical Institute

Abstract. In healthy boys from newborn to 12 years of age, the morphometric indicators of the head in the second period of childhood showed a normal growth rate compared to the period of infancy: head circumference 1.5 times (25.3%), the longitudinal size of the skull base 1.7 times (15.3%), the transverse size of the head is 1.7 times (20.8%), the transverse size of the forehead is 1.6 times (16.2%), the vertical diameter of the head is 2.0 times (20.7%), the longitudinal size of the skull base is 1.6 times (20.2%) and the transverse size of the head increased by 1.9 times (34.6%).

Key words: boy, morphometry, childhood, healthy, head, size.

Relevance. The craniofacial complex includes the head, face, and oral cavity and is the most distinctive of all structures of the human body, giving individuals unique characteristics. Structures of the craniofacial complex, such as the mandible, palate, temporomandibular joint (TMJ), and dentition, offer valuable paradigms for studying development, structure, and function (Ya. V. Kalincheva, 2011). The distinctive facial features of people with craniofacial deafness syndrome are the result of various abnormalities in the development of the skull and face. Children who are hard of hearing often have underdeveloped or absent nasal bones, resulting in a small nose, thin nostrils, and a flattened midface with a flat nasal bridge. People with this condition also typically have widely spaced eyes (ocular hypertelorism), narrowed eye openings (constricted palpebral fissures), a small upper jaw (maxillary hypoplasia), and a small mouth with pursed lips.

Purpose of the study. The purpose of this study was to measure and analyze indicators of physical development of the craniofacial complex in healthy boys.

Research methods. The study was carried out in 50 boys of different ages, indicators of the physical development of the craniofacial complex were measured - the shape of the skull was determined: longitudinal diameter, transverse size, head circumference, transverse size of the forehead, altitudinal or vertical diameter, determined the size of the base of the skull, the length of the base of the skull, the width of the base of the skull, Face: zygomatic diameter, mandibular diameter, inferior angle. jaws, morphological height of the face, physiological height of the face, height of the nose, width of the nose, external orbital width, interorbital width, height of the mucous part of both lips, mouth width, Chest: body length 1. standing height, 2. sitting height, body weight.

Research results. Based on the obtained data, the average head circumference of healthy baby boys is 36.8 ± 0.53 cm, the average longitudinal size of the skull base is 10.2 ± 0.27 cm, and the average transverse size of the head is 8.6 ± 0.28 cm. In boys of this age, the transverse dimension of the forehead is on average 7.4 ± 0.29 cm, the vertical diameter of the head is 6.9 ± 0.34 cm, and

the width and longitudinal dimension of the skull base are on average 7.5 ± 0.24 cm and 9.3 ± 0 It was 28 cm.

Significant differences were found between the head sizes of 3-year-old healthy boys and the head sizes of infant boys ($P>0.05$). In them, the average head circumference was 48.0 ± 0.64 cm, the average longitudinal size of the skull base was 14.6 ± 0.29 cm, and the average transverse size of the head was 11.4 ± 0.32 cm. The transverse dimension of the forehead is on average 10.7 ± 0.34 cm, the vertical diameter of the head is on average 11.3 ± 0.31 cm, the width of the skull base is on average 12.4 ± 0.21 and the longitudinal dimension of the skull base is on average 13.2 ± 0.26 reached cm.

Almost no differences were found between the head sizes of 4-year-old healthy boys and the head sizes of 3-year-old healthy boys. The average head circumference of boys of this age was 48.7 ± 0.54 cm, the average longitudinal and transverse dimensions of the head were 14.8 ± 0.33 cm and 11.6 ± 0.26 cm. The transverse dimension of the forehead is on average 10.9 ± 0.40 cm, the vertical diameter of the head is on average 11.6 ± 0.15 cm, the width of the skull base is on average 12.9 ± 0.39 and the longitudinal dimension of the skull base is on average 13.5 ± 0.44 It was found that it reached cm.

5-year-old boys obtained the following results from head measurements: the average head circumference is 49.4 ± 0.47 cm, the longitudinal size of the skull base is 15.1 ± 0.34 cm, the average transverse size is 11.9 ± 0.28 cm it happened. The average transverse dimension of the forehead is 11.0 ± 0.35 cm, the average vertical diameter of the head is 11.9 ± 0.36 cm, the average width of the skull base is 13.5 ± 0.54 , and the average longitudinal dimension of the skull base is 13.7 ± 0.14 is equal to cm.

The head sizes of 6-year-old healthy boys showed significant differences ($P<0.05$) between the head sizes of 3-4-year-old healthy boys, but almost no differences were found when compared with the head sizes of 5-year-old healthy boys. The average head circumference of 6-year-old boys is 50.8 ± 0.47 cm, the longitudinal size of the skull base is 15.2 ± 0.29 cm, and the transverse size of the head is 12.1 ± 0.21 cm. The transverse dimension of the forehead is on average 11.1 ± 0.30 cm, the vertical diameter of the head is on average 12.0 ± 0.38 cm, the width of the skull base is on average 13.7 ± 0.50 and the longitudinal dimension of the skull base is on average 13.9 ± 0.22 reached cm.

The average head circumference of 7-year-old boys is 52.1 ± 0.49 cm, the average transverse and longitudinal dimensions of the head are 12.9 ± 0.20 and 16.0 ± 0.30 cm, the average transverse dimension of the forehead is 11.3 ± 0.26 cm, the average vertical diameter of the head is 12.1 ± 0.29 cm, the average width of the skull base is 13.9 ± 0.40 , and the average longitudinal dimension of the skull base is 14.1 ± 0.27 cm.

It was observed that the head size of healthy 8-year-old boys increases dynamically with age. Significant differences were found in all indicators of head size compared to previous age groups ($R<0.05$). At this age, the head circumference of boys was 53.3 ± 0.41 cm on average, and the longitudinal size of the base of the head was 16.4 ± 0.26 cm on average. The average transverse size of the head is 13.5 ± 0.18 cm, the average transverse size of the forehead is 11.6 ± 0.23 cm, the average vertical diameter of the head is 12.4 ± 0.22 cm, the average width of the skull base is 14.1 ± 0.41 and the longitudinal dimension of the base of the skull was 14.4 ± 0.19 cm on average.

9-year-old healthy boys have an average head circumference of 54.1 ± 0.42 cm, an average of transverse and longitudinal head dimensions of 14.3 ± 0.23 and 16.6 ± 0.32 cm, and an average of 11.7 ± 0.23 cm, the average vertical diameter of the head is 13.3 ± 0.26 cm, the average width of the skull base is 14.5 ± 0.52 , and the average longitudinal dimension of the skull base is 14.5 ± 0.28 cm.

Significant differences were found between head sizes of 10-year-old healthy boys and head sizes of 6-8-year-old healthy boys ($P < 0.05$). Almost no differences were found when comparing the head sizes of healthy 9-year-old boys. The average head circumference of 10-year-old boys is 54.7 ± 0.38 cm, the average longitudinal size of the skull base is 17.3 ± 0.31 cm, and the average transverse size of the head is 14.6 ± 0.21 cm. The average transverse dimension of the forehead is 11.9 ± 0.26 cm, the average vertical diameter of the head is 13.6 ± 0.25 cm, the average width of the skull base is 14.6 ± 0.39 , and the average longitudinal dimension of the skull base is 15.5 ± 0.26 reached cm.

As the child's age increases, it was observed that the anthropometric indicators of his head size also increase in relation to age.

The average head circumference of 11-year-old boys was 55.2 ± 0.40 cm, the average cross-sectional size of the head was 14.9 ± 0.18 cm, and the average longitudinal size was 17.6 ± 0.28 cm. The transverse dimension of the forehead is on average 12.2 ± 0.23 cm, the vertical diameter of the head is on average 14.2 ± 0.24 cm, the width of the skull base is on average 14.9 ± 0.48 , and the longitudinal dimension of the skull base is on average 15.6 ± 0.20 was found to be equal to cm.

The head size of healthy 12-year-old boys grew dynamically. At this age, healthy boys had an average head circumference of 56.1 ± 0.37 cm, an average cross-sectional size of the head of 15.1 ± 0.20 cm, and an average length of 17.8 ± 0.26 cm. The average transverse dimension of the forehead is 12.4 ± 0.17 cm, the average vertical diameter of the head is 14.6 ± 0.26 cm, the average width of the skull base is 15.1 ± 0.42 , and the average longitudinal dimension of the skull base is 15.7 ± 0.27 reached cm.

Table 1 shows the morphometric parameters of the head sizes of healthy boys by childhood.

Table 1

Morphometric indicators of head sizes of healthy boys by childhood

childhood periods show (sm)	Baby	infant period	early childhood period	childhood of I- period	Childhood of II period
head circumference size	31,8-40,3 $36,8 \pm 0,62$	43,1-47,8 $46,1 \pm 0,16^*$	46,3 - 50,3 $48,2 \pm 0,15^*$	46,3-53,8 $49,8 \pm 0,18^*$	50,2-58,5 $54,7 \pm 0,14^*$
longitudinal dimension of the head	9,6-12,8 $10,2 \pm 0,23$	10,4-13,6 $11,6 \pm 0,20$	11,0-15,1 $13,1 \pm 0,27^*$	12,6-17,3 $15,1 \pm 0,10^*$	14,0-20,1 $17,1 \pm 0,10^*$
transverse dimension of the head	7,6-9,9 $8,6 \pm 0,17$	8,0-10,4 $9,2 \pm 0,15^*$	9,1-11,7 $10,4 \pm 0,17^*$	10,1- 13,7 $12,0 \pm 0,08^*$	12,3-16,6 $14,5 \pm 0,07^*$
the transverse dimension of the forehead	4,7-9,1 $7,4 \pm 0,32$	5,4-10,0 $8,6 \pm 0,29$	7,6-10,8 $9,8 \pm 0,21^*$	8,8-12,7 $11,0 \pm 0,08^*$	10,0-13,8 $12,0 \pm 0,13^*$
vertical diameter of the head	4,2-9,1 $6,9 \pm 0,36$	6,7-10,3 $8,2 \pm 0,22^*$	8,0-11,9 $9,9 \pm 0,26$	9,7-13,4 $11,8 \pm 0,07^*$	11,8-15,9 $13,6 \pm 0,06^*$
the width of the base of the skull	5,1-9,0 $7,5 \pm 0,28$	6,9-10,1 $8,1 \pm 0,20$	9,2-12,2 $10,9 \pm 0,20^*$	10,5-15,9 $13,3 \pm 0,11^*$	11,2-18,7 $14,6 \pm 0,12^*$
longitudinal dimension of the skull base	6,4-11,4 $9,3 \pm 0,37$	7,8-12,1 $9,8 \pm 0,27$	9,9-13,7 $11,4 \pm 0,25^*$	12,0-15,1 $13,7 \pm 0,06^*$	13,3-17,2 $15,1 \pm 0,06^*$

Note: *- reliable data on the ratio of the previous period of childhood are indicated ($P \leq 0.05$).

Summary. In healthy female children from newborn to 12 years of age, the morphometric parameters of the head in the second period of childhood showed a normal growth rate compared to the period of infancy: head circumference 1.5 times (25.3%), the longitudinal size of the skull base 1.7 times (15.3%), the transverse size of the head is 1.7 times (20.8%), the transverse size of the forehead is 1.6 times (16.2%), the vertical diameter of the head is 2.0 times (20.7%), the longitudinal size of the skull base is 1.6 times (20.2%) and the transverse size of the head increased by 1.9 times (34.6%).

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