Study of Growth and Development Processes in Children and Correlations between Parameters


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Abstract. An important task of medicine as a science is a comprehensive study of biological and social laws affecting the human organism during its life. Human growth and development are conditioned by the action of hereditary and environmental factors [9, 18]. Heredity and environment are not alternative and mutually exclusive categories; on the contrary, their interaction determines the phenotype [10, 14, 16]. If a gene is dramatically abnormal and overlaps the effect of all normal genes and environment, then heredity is more pronounced [4]. Especially dangerous is the impact of unfavourable endo- and exogenous factors during embryogenesis, which can significantly affect the hereditary code of development [2, 3, 11]. Many morphofunctional indices (body length and weight, chest circumference, etc.) have polygenic heritability and continuous variability due to the functioning of various genes. Literature sources contain numerous data on the influence of extragenital pathology of the mother, environmental and social conditions of her residence, parents' occupation, occupational hazards, stressful situations and a number of other factors on the indicators of physical development of newborns [1, 6, 7, 12, 15, 17].

The study of physical development of adolescent girls is very important, in this period of development girls undergo not only great changes in physical development, but also the restructuring of reproductive organs. To study the processes of growth and development of children it is necessary to study the correlations between the parameters.

Material and methods of research. Anthropometric measurements of 12-5 years old girls of Samarkand city were made, 100 girls were studied for each age. The following body parameters were studied: longitudinal and transverse diameters of the skull, head circumference, transverse size of the forehead, vertical diameter of the skull, length and width of the skull base, zygomatic and mandibular diameters, body length and weight, trunk length, body length, chest circumference in 3 states: at (rest, at the height of inhalation and at full exhalation), upper segment length, transverse and antero-posterior chest diameters, chest height, upper and lower limb lengths and their segments, shoulder and hip circumferences, shoulder width, pelvic width, and a correlation relationship (1) between weight, chest circumference (at rest), upper and lower limb lengths and body height was established.

Anthropometric measurements showed that the longitudinal diameter of the skull in 12-year-old girls was 16.75±0.17 cm, in 13-year-old girls 16.83±0.18 cm, in 14-year-old girls 16.93±0.18 cm, in 15-
year-old girls 17.07±0.16 cm. Transverse diameter of the skull at 12 years is 14.66±0.15 cm. at 13 years 14.78±0.17 cm, at 14 years-15.04±0.15 cm, at 15 years-15.11±0.13 cm, head circumference at 12 years is 51.95±0.33 cm. at 13 years 52.60±0.37 cm, in 14 years-53.31±0.36 cm and in 15 years-53.63±0.36 cm, transverse dimension of forehead in 12 years-10.63±0.11 cm, in 13 years-10.87±0.12 cm, in 14 years-11.29±0.17 cm, in 15 years-11.43±0.13 cm, height (vertical) da metre of skull in 12 years-13, 29±0.18 cm, in 13 years -13.36±0.20 cm, in 14 years 13.73±0.18 cm, in 15 years 13.73±0.16 cm, length of skull base in 12 years 14.80±0.17 cm, in 13 years-15.14±0.20 cm, in 14 years 15.28±0.18 cm. at 15 years 15.37±0.16 cm, skull base width at 12 years 12.32±0.13 cm. at 13 years 12.66±0.13 cm, at 14 years 12.84±0.13 cm, at 15 years 12.94±0.13 cm, zygomatic diameter at 12 years 11.91±0.16 cm, at 13 years 12.21±0.16 cm. At 14 years 12.22±0.16 cm, at 15 years 12.44±0.16 cm, mandibular diameter at 12 years 9.65±0.15 cm, at 13 years 9.99±0.16 cm, at 14 years-10.15±0.18 cm, at 15 years - 10.46±0.14 cm, the average value of body length in girls of Samarkand at 12 years is equal to 10.46±0.14 cm. Samarkand at 12 years of age is 144.71±2.32 cm, in girls of Minsk city body length is 154.6 cm, in girls of Samarkand city at 13 years of age 155.6 cm, in girls of Minsk city at 15 years of age 154.6 cm. Samarkand girls at the age of 13 are 155.40±2.53 cm, in girls of Altai district of Osh oblast (2) 144±7 cm, in girls of Minsk 159.3 cm, at the age of 14 girls of Samarkand 158.91±2.53 cm, in girls of Osh oblast (2) 144±7 cm, in girls of Minsk 159.3 cm. At the age of 15, the body height of girls of Samarkand is 158.91±2.02 cm, Kyrgyz girls 150.26 cm, girls of Minsk 162.4 cm, at the age of 15, respectively, 159.63±1.89 cm, 153±7 cm and 162.4 cm, body weight at the age of 12, girls of Samarkand - 34.57±1.68 kg, girls of Minsk 42.9 kg, at the age of 13, girls of Samarkand - 34.57±1.68 kg. Samarkand girls. 41.33±1.84 kg, in girls of Minsk 48.8 kg, in 14 years of age in girls of Samarkand 46.42±1.84 kg. Samarkand girls 46.42±1.80 kg. in girls of Minsk - 54.6 kg, at 15 years of age in girls of Samarkand. Torso length at the age of 12 is 42.42±0.86 cm, at the age of 13 is 44.62±0.90 cm, at the age of 14 is 47.03±0.90 cm. in 14 years 47.95±0.67 cm, body length in 12 years- 66.14±1.49 cm, in 13 years-71.83±1.85 cm, in 14 years 73.59±1.73 cm, in 15 years 73.60±1.45 cm. chest circumference at rest (in pause in 12 years 64.61±1.24 cm, in 13 years 69.23±1.23 cm, in 14 years 72.95: 1.22 cm, at 15 years 75.46±1.23 cm, chest circumference at height of inspiration at 12 years - 68.89±1.20 cm, at 13 years 73.76±1.36 cm. at 14 years 77.63±1.24 cm. In 15 years - 80.13±1.15 cm, chest circumference at full exhalation in 12 years 63.76±1.24 cm, in 13 years 68.40±1.25 cm. in 14 years - 72.06±1.20 cm, in 15 years 74.72±1.20 cm, waist circumference in 12 years 55. 32±1.22, at 13 years- 58.18±1.15 cm, at 14 years- 60.40±1.18 cm, at 15 years 62.21±1.32 cm, upper arm length at 12 years 21.58±0.36 cm, at 13 years-22.54±0.39 cm, at 14 years 23, 12±0.36 cm, at 15 years 23, 52±0.41 cm, transverse breast diameter at 12 years- 20.36±0.34 cm, at 13 years 21.55±0.36 cm, at 14 years 22.16±0.36 cm, at 15 years 22.91±0.38 cm, antero-posterior diameter of chest at 12 years 14.91±0.32 cm, at 13 years 15.25±0.32 cm, at 14 years 16.13±0.31 cm, at 15 years 16.54±0.38 cm, chest height at 12 years 23, 60±0.49 cm, in 13 years- 25.30±0.56 cm, in 14 years-26.93±0.53 cm, in 15 years- 27.60±0.52 cm, length of upper limb in 12 years- 62.61±1.32 cm, in 13 years- 67.63±1.02 cm. At 14 years 69.84±0.91 cm, at 15 years 70.47±0.77 cm, shoulder length at 12 years 23.18±0.40 cm, at 13 years 24.87±0.41 cm, at 14 years 25.50±0.32 cm, at 15 years 26.00±0.34 cm, shoulder width at 12 years 30.23±1.45 cm,Shoulder width of adolescent girls in Samarkand at age 13 was 31.64±0.46 cm, in Osh girls - 32.0±1.8 cm, at age 14 respectively 32.90±0.52 cm and 34.2±1.6 cm, at age 15 33.31±10.49 cm and 33.9±1.7 cm, shoulder girth at rest at age 12 19.33±0.48 cm, at age 13 - 20.90±0.54 cm. In 14 years 22.14±0.53 cm, in 15 years 23.40±0.57 cm, shoulder girth at tense standing in 12 years-20.35±0.37 cm, in 13 years 21.87±0.36 cm, in 14 years 22.54±0.37 cm, head length at 12 years-16.61±10.28 cm, at 13 years-17.59±0.30 cm. In 14 years - 18.10±0.25 cm, in 15 years - 18.23±0.23 cm, length of lower limb in 12 years 78.48±1.26 cm, in 13 years - 83.52±1.23 cm in 14 years 85.42±1.02 cm, in 15 years
86914±0,97 cm, length of thigh in 12 years - 38,96±0,69 cm, in 13 years - 41,48±0,63 cm; at 14 years 42,40±0,61 cm, at 15 years 42,90±0,56 cm, thigh circumference at 12 years 41,05 1,09 cm, at 13 years 43,82±1,32 cm, at 14 years 47,68±1,19 cm, at 15 years 49,94±1,18 cm, pelvic width at 12 years 22,1610,46 cm. At 13 years 24,52-0,51 cm, At 14 years 25,1±0,44 cm, At 15 years 26,4810,41 cm, Tibia length at 12 years 33,66-0,60 cm. and at 13 years. 35,07±0,60 cm, at 14 years 36,68±0,53 cm, at 15 years.

30,93±0,61 cm, tibia circumference at 12 years 27,18-0,68 cm, at 13 years 29,02±0,61 cm, at 14 years 30,56±0,64 cm, at 15 years 31,50±0,61 cm, foot length at 12 years 22,7340,32 cm, at 13 years 23,67±0,35 cm, at 14 years - 24,02±0,26 cm, at 15 years 24,04±0,28 cm. Our study of correlation dependence in adolescent girls showed that at 12 years of age with an average weight of 34.57±1.69 kg from a height of 144.71±2.32 cm, the correlation coefficient was 0.6033, at 13 years of age. This value with an average weight of 41.33±1.84 kg and an average height of 155.40±2.53 cm was 0.5617, at 14 years of age this value with an arithmetic mean of 46.42±1.80 kg and an average height of 158.91±2.02 was 0.4381, at 15 years of age the correlation coefficient with an average weight of 50.58±2.04 kg and a height of 159.63±1.89 cm was 0.3385. The value of the correlation coefficient at 12 years of age when studying the correlation relationship between the mean values of chest circumference (at rest) of 64.61±1.24 cm with a mean height of 144.71±2.32 cm was 0.6331, at 13 years old this value with chest circumference (at rest) 69,23±1,23 cm and height 155,40+2,53 cm was 0,5571, at 14 years old with average chest circumference 72.95±1.22 cm and height 158,91±2.02 cm was 0,4311, at 15 years old the correlation coefficient 0.1881 with average chest circumference 75. 46±1.23 and height 159.63±1.89 cm.

Estimation of the correlation coefficient value of the upper limb length dependence on height showed that at 12 years of age in girls with average upper limb length 62,61±1,32 cm and average height 144,71±2,32 cm this value was equal to 0,4504, at 13 years of age with average upper limb length 67,6311,02 cm and height 155,40±2,53 cm it was 0,7148. At 14 years of age, with mean upper limb length 69.84±0.91 cm and mean height 158.91±2.02 cm, the correlation coefficient was 0.4229 At 15 years of age, the correlation coefficient was 0.5637 with arithmetic mean upper limb length 70.47±0.77 cm and mean height 159.63±1.89 cm. When calculating the correlation coefficient of lower limb length from height, we found that this index has the following values 12 years old with the mean values of lower limb length 78,48±1,26 cm and height 144,71±1,32 cm it is equal to 0,8038, at 13 years old this index is 0,7331 with the arithmetic mean values of lower limb length 83. 52±1.23 cm and average height data: 155.40-2.50 cm, at 14 years of age this correlation coefficient at mean lower limb length data 85.42±1.02 cm and average height data 158.91±2.02 cm is 0.4982, at 15 years of age - at mean lower limb length data 86.14±0.97 cm and average height data 159.63±1.89 cm this index was 0.6694 The correlation relationship between weight and height is average at 12 years of age it is at its upper limit (0. 6033) of the mean score, with a gradual decrease in its 15 years of development to the lower boundary (0.3185) of the mean score.

Conclusions: Thus, some authors note that morphofunctional indicators of newborns are influenced by the constitutional features of their parents. Morphofunctional characteristics, being the most stable indicators of endogenous processes in the human body, can be determinant in assessing the physical development of a child. In this regard, we have given a comprehensive assessment of the interrelationships of quantitative characteristics of newborns and their mothers on the basis of correlation and factor analysis.

Literature


