

Features of Anthropometric Parameters of the Vertebral Column in Boys Aged 1-16 Years Living in Rural and Urban Conditions of the Khorezm Region

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Abstract Annotation. The article examined 539 boys aged 1 to 16 years living in the city of Urgench and in the Shavat district of the Khorezm region of the Republic of Uzbekistan. Anthropometric studies of the length of the spine were conducted and studied. According to the results of the anthropometric survey, the differences in the results of the anthropometric survey of boys aged 1 to 16 years living in rural and urban areas were analyzed. Based on these studies, the length of the spine of boys 1-3 and 4-7 years old living in urban areas exceeded the length of the spine of boys 1-3 and 4-7 years old living in rural areas. In the age group of 8-12 and 13-16 years, it was higher in rural boys.

Keywords Anthropometric indicators, Vertebral column, Regions of the Southern Aral Sea region

1. Introduction

The most important condition for improving the health of children and adolescents is to identify and study the characteristics of their growth and development [5].

Anthropometric studies are of particular importance in the medical examination of children and adolescents, it allows children and adolescents to determine their development over time in accordance with certain age and physical requirements for development. In addition, anthropometric examination helps to identify pathological changes in the growth and physical development of children and adolescents, as well as to prevent the development of many diseases [6].

The concept of "physical development" is interpreted differently by different authors. P. I. Bashkirov noted that the concept of "physical development" is a unit of morphological and functional properties of an organism [3].

According to Levin V.N., the concept of "physical development" is the state of functional, physiological indicators and the health of the body. Vladovsky V. G. characterizes the concept of "physical development" by the sum of morphofunctional signs of the degree of age-related biological development of the organism [4].

When determining the level of physical development of children and adolescents, anthropometric research is most often used [9,10,11].

Normal growth and development of the spine play an important role in the physical development of children and adolescents. As the child grows up, the growth and development of the spine is accompanied by an increase in its length, size and mass, and the cartilaginous parts of the spine are replaced by bone. The transition of the child's body to an upright position leads to the formation of physiological bends of the spine. The transition to the vertical position of the child leads to an increase in the volume of the spine from top to bottom [1,7,8].

In the first years of life, the development of the spine is so intense that even after a short period of time, certain changes occur in the structure of the spine. Therefore, E.V. Ulrich, A.Y. Mushkin believes that it is necessary to pay attention to the age-related features of the normal development of the spine [2,8].

Khorezm region of the Republic of Uzbekistan is one of the most environmentally unfavorable regions of the Southern Aral Sea region. The deterioration of the environmental situation in the Southern Aral Sea region has not been left without its impact on the health of children and adolescents. Conducting medical examinations of children and adolescents living in these climatic conditions will help prevent various diseases. The study of the processes of physical development in children living in different geographical zones, as well as in urban and rural conditions, is of great importance for improving human ecology and health promotion. Based on the above, the purpose of our study was a comprehensive study of the level of physical development based on anthropometric indicators of 5-8-year-old children living in urban and rural conditions of the Khorezm region.

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The data obtained were statistically processed using the Microsoft office Excel 2010 software package on a Pentium IV computer.

2. The Purpose of the Study

The study of anthropometric indicators of various parts of the spinal column in children of adolescents aged 1-16 years living in rural and urban conditions of the Khorezm region, the Republic of Uzbekistan.

3. Materials and Methods

539 boys of children aged from 1 to 16 years, teachers of preschool educational institutions, secondary school students permanently residing in the city of Urgench and the Shavatsky district of Khorezm region, which is located in the Southern Aral Sea region, were selected. Of these, urban boys - 254, and rural - 285. The data obtained were recorded in the form "Anthropometric medical examination" approved by the Academic Council of the TMA of the Urgench branch (Protocol No. 430 November 2019).

4. Results and Discussion

The results of the survey showed that the growth processes of the spinal column of boys aged 1-16 years living in rural and urban conditions. it has significant age and individual differences.

Anthropometric indicators of the spinal column of urban boys of different age groups: the total length of the vertebral column in the age group of 1-3 years is on average 29.6 ± 3.4 cm, the length of the cervical spine is on average 4.4 ± 0.21 cm (14.8% of the average total length of the vertebral column), the length of the thoracic spine was on average 15.4 ± 1.23 cm (52%), while the lumbar spine the spine section averaged 5.3 ± 0.16 cm (17.9%), the sacro-coccygeal section 4.5 ± 0.14 cm (15.2%).

The total length of the vertebral column in the age group of 4-7 years is on average 36 ± 6.31 cm, the length of the cervical spine is on average 5.4 ± 0.12 cm (15% of the average total length of the spinal column), the length of the thoracic spine was on average 19.2 ± 5.4 cm (53.3%), while the lumbar spine the average was 6.1 ± 0.32 cm (16.9%), sacro-coccygeal 5.3 ± 0.15 cm (14.7%).

The total length of the vertebral column in the age group of 8-12 years is on average 43.7 ± 5.21 cm, the length of the cervical spine is on average 6.0 ± 0.61 cm (13.7% of the average total length of the vertebral column), the length of the thoracic spine was on average 24.9 ± 6.12 cm (56.9%), while the lumbar spine in the average was 6.7 ± 0.51 cm (13.3%), sacro-coccygeal 6.1 ± 0.34 cm (13.9%).

In the age group of 13-16 years, the total length of the vertebral column is on average 59.8 ± 9.21 cm, the length of the cervical spine is on average 7.1 ± 0.52 cm (11.8% of the

average total length of the vertebral column), the length of the thoracic spine was on average 31.0 ± 5.63 cm (51.83%), while the lumbar spine in the average was 11.1 ± 0.61 cm (18.5%), sacro-coccygeal 10.6 ± 1.23 cm (17.7%).

Anthropometric indicators of the vertebral column of rural boys of different age groups: In the age group of 1-3 years, the total length of the vertebral column is on average 28.7 ± 6.23 cm, the length of the cervical spine is on average 4.3 ± 0.25 cm (14.9% of the average total length of the vertebral column), the length of the thoracic spine was on average 15.1 ± 3.2 cm (52.6%), while the lumbar spine on average, it was 5.0 ± 0.4 cm (17.4%), sacro-coccygeal 4.3 ± 0.11 cm (14.9%).

The total length of the spinal column in the age group 4-7 years is on average 35 ± 9.52 cm, the length of the cervical spine is on average 5.2 ± 0.36 cm (14.8% of the average total length of the spinal column), the length of the thoracic spine was on average 18.9 ± 6.24 cm (54%), while the lumbar spine in the average was 5.9 ± 0.43 cm (16.8%), sacro-coccygeal 5.1 ± 0.36 cm (14.5%).

The total length of the vertebral column in the age group of 8-12 years is on average 45 ± 8.36 cm, the length of the cervical spine is on average 6.14 ± 0.4 cm (13.6% of the average total length of the vertebral column), the length of the thoracic spine was on average 25.3 ± 5.36 cm (56.2%), while the lumbar spine in the average was 6.9 ± 0.53 cm (15.3%), the sacro-coccygeal section was 6.4 ± 0.41 cm (14.2%).

In the age group of 13-16 years, the total length of the vertebral column averages 61.15 ± 7.36 cm, the length of the cervical spine averages 6.15 ± 7.36 cm (12.5% of the average total length of the vertebral column), the length of the thoracic spine averaged 31.61 ± 7.36 cm (51.6%), while the lumbar spine averaged it was 11.5 ± 0.56 cm (18.8%), sacro-coccygeal 10.9 ± 1.2 cm (17.8%). (Fig. 1.)

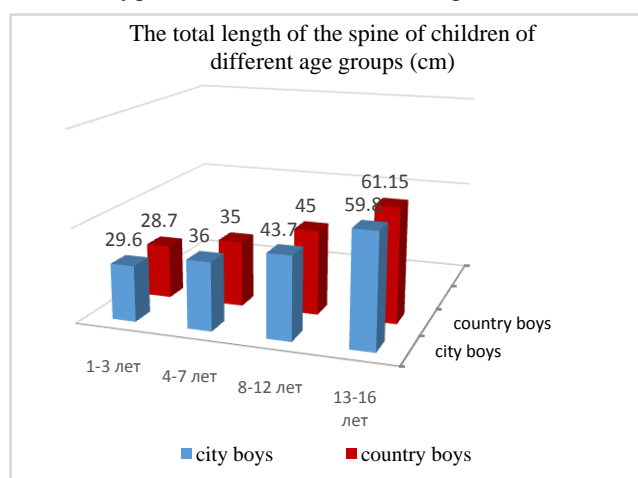


Figure 1. The total length of the spine in boys 1-16 years old

5. Conclusions

It follows from the data that the length of the spine in urban boys aged 1-3 and 4-7 years exceeds the length of the

spine of rural boys (1-3 years 1.2 cm, 0.7 cm; 4-7 years 1.0 cm, 0.7 cm). In the group of 8-12 years old, the spine length of rural boys is greater than that of urban boys (1.3 cm). In the age group of 13-16 years, the average length of the vertebral column of rural boys is longer (1.35 cm) than that of urban boys in the age group of 13-16 years. The same trend is observed in the age group of 13-16 years. It was also revealed that the length of the spine of the adolescent group, compared with the 1-3 year group, increases by about 50-52% almost equally in all examined. The total length of the spine of urban adolescent boys exceeds that in relation to the age group of 1-3 years by 2 times, and in rural boys - by 2.1 times. In urban teenage girls, this ratio is 2.1 times, and in rural girls – 2.2 times. The prevalence of an increase in the length of the spine in rural adolescents compared to urban adolescents may indicate greater physical activity and a more active lifestyle.

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