



Dependence of the Volume of the Thyroid Gland on Anthropometric Data in Children Early Age

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Abstract: The study presents the correlation between the comparative sizes of the right and left lobes of the thyroid gland and the indicators of the physical development of boys and girls of 8 years old. The correct correlation of the size of the thyroid gland with indicators of physical development was revealed.

Keywords: ultrasound, thyroid gland, anthropometric measurements, morphometric indicators.

Introduction

Interest of pediatricians and pediatric endocrinologists to the problems associated with the state of thyroid gland is defined as the significance its functions for a growing organism, and a trend towards an increase in thyroid diseases. Until recently, it was believed that diseases thyroid pits are prone to children dash older age groups. Significant "omolocation" of thyroid pathology, high frequency transient neonatal hypothyroidism and non the need for dynamic monitoring of this a contingent of children at an early age in order to timely correction, as a rule, subcli manifestations of thyropathies determined the giving a survey of the least traumatic and fast different methods for recognizing and evaluating changes thyroid gland [1,3]. Changes in the volume of the thyroid gland (TG) - integral indicator, determined by the complex atnative, climatic, environmental, social and other factors that may directly or indirectly affect thyroid function or its regulatory systems [4,5].

Iodine is an essential element for the synthesis of hormones thyroid gland and adequate iodine supply nie is a guarantee of its normal structure and function [2,8,10]. It is currently generally accepted that ultrasonic morphometry is objective and the most accurate method for determining the size of the thyroid gland and is characterized by a high standardization of anatomical assessment its topographic condition [1,7]. The developing thyroid gland of children is very sensitive sensitive to the influence of environmental factors, in first of all, iodine deficiency and environmental troubles [9,12].

The aim of this work was to establish normative size of the thyroid gland in children (boys and girls) at the age of 8 living in the Bukhara region, and determining the dependence of the thyroid volume of the children's age, body weight, height and chest circumference.

Material and methods

The research was conducted at secondary school No. 7 in the city of Bukhara. The results of the examination of 86 children (52 boys and 60 girls) were studied 8 years of age. The results of echovolumemetry were analyzed thyroid gland in 112 healthy children aged 8 years, permanently residing in the Bukhara region. The selection criterion was the absence of:

Ultrasound examination was conducted on the basis of the Bukhara Regional Endocrinological Dispensary and was devoted to the study of ultrasound anatomy of the thyroid gland. The study was carried out on the SONOACE R3-RUS device with linear (frequency 7.5 MHz) and convex (frequency 3.5 MHz) sensors.

The anthropometric measurements used the method of anthropometric studies of children (methodological recommendations of N.H.Shomirzaev, S.A.Ten and I.Tukhtanazarova, 1998). The anthropometric study included the measurement of body length, body weight, trunk length and chest circumference.

Mathematical processing was performed directly from the general Excel 7.0 data matrix using the capabilities of the STTGRAPH 5.1 program, the standard deviation and representativeness errors were determined.

Results and discussions.

Ultrasound indicators of the thyroid gland in 8-year-old children

In 8-year-old boys, it was found that the length of the right lobe of the thyroid gland is from 2.4 to 3.2 cm, on average 3.0 ± 0.025 cm, the width is from 1.2 to 1.5 cm, on average 1.3 ± 0.009 cm, thickness from 1.4 to 2.2 cm, on average - 1.7 ± 0.025 cm. The volume of the right lobe of the thyroid gland in boys of 8 years was from 1.9 to 5.0 cm³, and on average 3.2 ± 0.095 cm³.

Ultrasonic dimensions of the left lobe of the thyroid gland significantly differed ($P < 0.05$) from those in boys aged 3-6 years, but data were obtained close to those in boys 7 years old. It was established that the length of the left lobe of the thyroid gland in boys of 8 years old ranged from 2.3 to 3.3 cm, on average 3.0 ± 0.028 cm, width from 1.0 to 1.5 cm, on average 1.3 ± 0.016 cm. Its thickness is from 1.3 to 2.0 cm, on average - 1.6 ± 0.022 cm. The volume of the left lobe of the thyroid gland is from 1.4 to 4.7 cm³, on average 3.0 ± 0.10 cm³, the neck height glands from 0.22 to 0.45 cm, on average 0.32 ± 0.006 cm.

In 8-year-old girls, the length of the right lobe of the thyroid gland is from 2.5 to 3.3 cm, on average 3.1 ± 0.023 cm, the width of the right lobe is from 1.3 to 1.5 cm, on average $1.4 \text{ cm} \pm 0.006$ cm, and its thickness was from 1.3 to 2.3 cm, on average - 1.8 ± 0.029 cm. The volume of the right lobe of the thyroid gland in girls of 8 years old was from 2.0 to 5.5 cm³, and on average 3.9 ± 0.010 cm³.

In 8-year-old girls, there was a slight but significant increase in the ultrasonic dimensions of the left lobe of the thyroid gland compared with 6- and 7-year-old girls ($P \leq 0.05$). In girls 8 years old, the length of the left lobe of the thyroid gland is from 2.3 to 3.4 cm, on average 2.9 ± 0.032 cm, the width of the left lobe at this age is from 1.1 to 1.6 cm, on average 1.4 ± 0.015 cm, and the thickness was from 1.1 to 2.4 cm, on average - from 1.9 ± 0.038 cm. The volume of the left lobe of the thyroid gland ranged from 1.3 to 6.3 cm³, on average 3.8 ± 0.14 cm³. It was established that the height of the neck of the gland is from 0.30 to 0.66 cm with an average variation of 0.50 ± 0.013 cm.

Data on anthropometric parameters of 8-year-old children

The growth indicators of 8-year-old boys ranged from 120.2 to 132.5 cm, on average 126.7 ± 0.38 cm. The body weight of boys of this age ranged from 24.5 to 31.6 kg, on average 27.0 ± 0.22 kg, and body length from 30.8 to 43.6 cm, on average 39.5 ± 0.46 cm.

8-year-old girls showed significant differences ($P \leq 0.05$) in indicators of physical development: height, body weight and body length compared with 6- and 7-year-old girls. The growth rates of girls of 8 years old range from 118.3 to 140.8 cm, on average 130.2 ± 0.65 cm. The body weight of girls of this age is from 23.5 to 29.3 kg, on average 25.1 ± 0.17 kg, and body length from 27.6 to 45.1 cm, on average 38.3 ± 0.51 cm.

Conclusions

1. The revealed positive correlation dependence of thyroid volume on the main anthropometric parameters of an early age child hundred confirms the need to take into account the latest in the epidemiological approach to rationing thyroid volume.
2. For the purpose of epidemiological assessment of the distribution oddities of endemic increase in size thyroid gland in young children in the district those with a mild degree of iodine deficiency are recommended it is possible to use centile distribution tables thyroid volume, giving preference to centile tables depending on body weight child.

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