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Specific Characteristics of the Thyroid Gland Morphometric Parameters in Goit's Disease

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Abstract

This article provides information on the results of scientific studies that can be used to evaluate and study the morphological characteristics of the thyroid gland in the cause of thyroid disease caused by inadequate intake of iodine, thyroid hormone (thyroxine and triiodothyronine) synthesis disorders.

Keywords: diffuse goiter, sexual dimorphism, physical development, adolescent endocrine system.

The physical development of children is a unique indicator of the health of the population, on which it is possible to trace both epoch-making changes in the biological nature of a person and relatively short-term effects on the population. Physical development can serve as a criterion for assessing the environmental situation, and physical development standards are the most important element of population monitoring of the health of children and adolescents [3].

Identification of shifts in the state of physical development (PD) of children is one of the topical areas of human ecology at the population level, which may differ in different generations. The study of anthropometric characteristics of physical development is usually considered as a way of adapting the organism to the environment [5].

One of the important indicators reflecting the state of health of the population is the level of physical development of children and adolescents. Unlike demographic characteristics (fertility, reproduction, average life expectancy), it is an indicator that characterizes the result of the interaction of all body systems with each other and with the environment [18].

Among external environmental factors, the influence of natural iodine deficiency in geochemical provinces against the background of weakening iodine prophylaxis and worsening manifestations of iodine deficiency diseases deserves special attention [13].

Iodine deficiency states are among the most common non-infectious pathological changes in humans. According to WHO, about 2 billion people on Earth live in conditions of iodine deficiency. Currently, there are no territories where the population would not be at risk of developing iodine deficiency states [28].

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However, despite many years of struggle against iodine deficiency, the problem of iodine deficiency is still not resolved in many countries of the world, including Uzbekistan.

Anthropometric parameters and body composition are important indicators of personality growth. These indicators depend on age, gender, nutrition, ethnicity and lifestyle [24]. Anthropometric indicators are used to assess the prognosis of chronic and acute diseases, as well as to guide medical interventions in young people [27].

According to the WHO, 13% of all mankind have certain iodine deficiency conditions, of which 655 million are diagnosed with goiter.

Thus, the study of morbidity, timely diagnosis and prevention of endocrine diseases in children seems to be very relevant [36].

Iodine deficiency diseases are the most common non-infectious pathology, both in Uzbekistan and around the world. The problem of iodine deficiency diseases is the most important global medical, socio-economic problem of our time. The significance of the problem is determined by the terrible consequences of iodine deficiency in people of almost all age groups [1]. Iodine deficiency in the biosphere is a stable factor, so the problems it causes become enduring [9].

Until now, despite the importance of the problem of the negative impact of iodine deficiency conditions on the health of pubertal children, the anthropometric parameters of physical development and the impact on puberty in puberty adolescents living in endemic zones with different environmental conditions remain insufficiently studied [14].

The incidence rates of diffuse endemic goiter, as well as other thyroid diseases associated with iodine deficiency, differ in different regions and depend on the ecological situation in them [4,30].

At present, the influence of natural and technogenic factors on the development of thyroid pathology has been proven [14].

Iodine is one of the most important trace elements for human life, involved in the functioning of the thyroid gland, providing the formation of hormones (thyroxine and triiodothyronine). Insufficient intake of iodine in the body leads to a violation of the synthesis of thyroxine. This causes a compensatory diffuse enlargement of the thyroid gland as a result of its hyperfunction, and the so-called goiter disease with hypothyroidism develops, accompanied by a slowdown in metabolism, retarded growth and mental development of children [6].

Currently, much attention is paid to the study of the processes of growth and development of children, the effect of iodine deficiency on the processes of growth and maturation of children and adolescents in endemic regions [8].

The high prevalence of iodine deficiency diseases and a wide range of negative consequences of

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iodine deficiency make it possible to attribute them to the most common non-communicable human diseases that can be prevented by providing the population with the necessary amount of iodine [29]. With iodine deficiency, reproductive dysfunction is noted, the number of miscarriages and stillbirths increases, and an increase in perinatal and infant mortality is observed [35].

Prevention of diseases associated with iodine deficiency is simple and, with the right solution, it is possible to almost completely prevent iodine deficiency disorders. The international community has mobilized to eliminate iodine deficiency diseases under the leadership of the World Health Organization and the International Council for the Control of Iodine Deficiency Diseases and the United Nations Children's Fund [32].

Especially vulnerable in this regard are young people, who often do not have the opportunity to adequately equip their living conditions (nutrition, financial stability, etc.), including timely seeking medical help [15,16,17,19].

Significant impact on the growth and development of children is exerted by unsatisfactory somatic and reproductive health of parents, social deprivation of the population, a decrease in the quality of nutrition, geochemical unfavorable territories, environmental pollution, physical inactivity, and stress [2].

There are data in the literature that mainly study the problem of puberty and the development of reproductive function in conditions of iodine deficiency in girls [26], which is completely justified. Works on the study of the sexual development of boys and the state of male sexual function in the regions of endemic iodine deficiency are not numerous. At the same time, in half of the cases, the cause of childlessness in married couples is male infertility, and half of the reproductive pathology in adult men has its own causes in childhood and adolescence. There is a high prevalence of malnutrition in young men of military age [7].

One of the reasons for the delay in the growth and development of children living in the gas-chemical regions are disorders in the thyrotropic-thyroid system [31].

In the industrial zone, the frequency of goiter is 2.1 times higher than in the ecologically safe zone [11]. In this regard, the study of the problem of endemic goiter in the industrial regions of the Republic of Uzbekistan is of great scientific and practical interest.

Thus, in iodine-deficient regions, deterioration in the main indicators of physical development is shown: in particular, an increase in the number of children with disharmonious development. Schoolchildren with endemic goiter have low growth [10].

The health status of adolescent girls is worse than that of boys due to the growth of gynecological pathology and functional disorders, which negatively affects the reproductive function of women and the demographic situation in the countries of the world [21]. The reproductive health of girls and

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girls with an assessment of physical and sexual development has been studied by a number of authors in recent years, but only certain contingents of girls were examined in these works [23].

Changes in the environmental situation make significant adjustments to the assessment of the causes and mechanisms for the development of iodine deficiency. The features of the formation of iodine deficiency under the influence of a complex of environmental factors remain insufficiently studied [32]. The thyroid gland is one of the first to respond to environmental changes and plays an important role in adapting to adverse effects. The combination of iodine deficiency and exposure to environmental strumogens mutually aggravate each other, and is an important part of the endemic problem [25].

Iodine deficiency worsens the health status of the population in the regions of endemic goiter. In this regard, the organization of preventive measures in such regions to increase the consumption of iodine by the population to a physiological level remains the most pressing issue.

Conclusions: Thus, when reviewing the available literature data, we did not find specific works devoted to the study of anthropometric parameters of body parts in adolescents with pathology of endemic goiter, taking into account sexual demorphism in anthropometric parameters. There are no data on anthropometric parameters of body parts and parameters of physical development of adolescents with thyroid pathology in the Bukhara region. All this requires a detailed study of this problem.

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