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THE IMPORTANCE OF IODINE PROVISION IN THE FORMATION OF THE INTELLECTUAL AND SOMATIC HEALTH OF THE CHILD POPULATION

Arzibekov Abdikadir Gulyamovich
Candidate of Medical Sciences, Docent
Head of the "Pediatrics" Department for the Medical Faculty of ASMI

Abstract
The article presents information about the physiological role of iodine, the prevalence and causes of iodine deficiency among the child population of Uzbekistan. The negative impact of iodine deficiency on somatic health, the formation of cognitive functions and fine motor skills in children of different ages, indicators of linear growth and the harmony of physical development are considered.

Keywords: children, deficiency, iodine, method, prevention.

INTRODUCTION

Iodine deficiency and related diseases, due to their high prevalence and negative clinical consequences, form a wide range of medical and social problems throughout the world [1]. In addition to natural deficiency, the following conditions can lead to iodine deficiency in a child's body:
1) diseases accompanied by impaired absorption of iodine in the intestine (intestinal infections and parasitic diseases, malabsorption syndrome, pathology of the pancreas, gall bladder and liver, cystic fibrosis);
2) genetically determined thyropathies;
3) increased need for iodine during critical periods of childhood (preschool, adolescence), as well as during pregnancy and lactation;
4) the presence of hypovitaminosis, hypo7 and dysmicroelementosis;
5) the supply of iodine in a form inaccessible for absorption;
6) the effect of medications and other environmental factors of a chemical and physical nature, including radiation exposure [2].

MATERIALS AND METHODS

Iodine deficiency is aggravated by poor nutrition of the population of all age groups, especially children and adolescents. According to the Scientific Center for Children's Health of the Uzbekistan Academy of Medical Sciences, there has been a decrease in

iodine consumption to an average of 60–80 mcg/day, with an average daily norm of 100–200 mcg.

In the embryonic period, thyroid hormones have an exceptional effect on the formation of the main structures of the brain. Thyroid hormone receptors are present in neurons and glial cells in the brain. Hormones stimulate the proliferation and migration of neuroblasts, the growth of axons and dendrites, the differentiation and myelination of oligodendrocytes, and the formation of synapses; activate the expression of the gene encoding the myelin protein, and also promote the accumulation of lipids and glycoproteins in the nervous tissue. A deficiency of thyroid hormones at any stage of brain formation results in a stop in its development and greater susceptibility to degenerative changes, which sharply worsens a person's intellectual and motor functions [3].

RESULTS AND DISCUSSION

The works of a number of researchers have shown that signs of iodine deficiency are present in every fifth child aged 1–6 months, as well as in half of women in the third trimester of pregnancy and the early postpartum period [3]. At the same time, 17% of children and 10% of lactating women had elevated values of thyroid-stimulating hormone (TSH). It has been proven that the iodine supply of the child was significantly influenced by the level of iodine in breast milk and the iodine supply of the mother herself; the likelihood of developing iodine deficiency diseases in infants increases 5 times with low iodine content in milk and 3 times with insufficient iodine supply to the mother. In addition, it was noted that indicators of physical development and rates of neuropsychic development, as well as the risk of developing perinatal damage to the central nervous system (CNS), as well as rickets, chronic enterocolitis, anemia, and the incidence of acute respiratory viral infections are closely related to the iodine supply of the child.

Children with hypothyroidism due to iodine deficiency are noticeably lagging behind in growth and development compared to their peers living in iodine-supplied regions. Thus, in conditions of moderate iodine deficiency, short stature is observed in 22% of children under 6 years of age; after 8 years, the number of short stature children decreases [4]

It is well known that severe forms of hypothyroidism are accompanied by severe growth retardation. The subclinical form of thyroid hypofunction also affects growth processes, giving less pronounced delays in physical development and deviations during puberty. Only in rare cases can severe hypothyroidism be accompanied by precocious puberty. Even mild deviations in the functional state of the thyroid gland

(for example, juvenile struma, which is most often accompanied by a relative deficiency of thyroid hormones) can lead to delayed sexual development. It has been shown that physical development and the formation of secondary sexual characteristics in iodine-deficient areas are significantly delayed in many people. Disharmony of weight and height indicators in children is noted even before the formation of manifest forms of iodine deficiency diseases [5].

It has been shown that the incidence of goiter in children aged -12 years with delayed physical development is 40%; primary hypothyroidism was detected in 9% of subjects; the presence of goiter with combined growth retardation and sexual development was noted in 55% of boys and -1% of girls. In addition, 60% of teenage girls with a pathological course of puberty had morphofunctional changes in the thyroid gland, hypothyroidism was detected in 1/3 of the patients; these children have a high percentage of chronic diseases of the digestive, nervous, and urinary systems [3].

Many researchers have noted the dependence of the frequency of somatic pathology in children on the presence of goiter. The risk of developing any chronic disease increases with grade I goiter by 24%, grade II - by 45% [4]. It has also been shown that with chronic gastroduodenitis in children, the functional activity of the thyroid gland is reduced, which is accompanied by a decrease in the content of free fractions T3 and T4, as well as an increase in the level of TSH [2].

Currently, urinary iodine excretion is considered as the main epidemiological indicator characterizing the iodine supply of a particular region. This is a highly sensitive indicator, it quickly responds to changes in iodine intake and is therefore of utmost importance not only for assessing the epidemiological situation, but also for monitoring programs for the prevention of iodine deficiency diseases. A decrease in the median iodine content from 100 μg/l confirms the iodine deficiency nature of endemic goiter [3].

Iodine enters the human body with food, water and air. The daily requirement for iodine depends on age (Table 1).

Table 1. Age norms for iodine intake per day

Age period	Iodine requirement, mcg/day
Children 0–5 years old	90
6–12 years	120
12 years and older	150
Pregnant and breastfeeding women	200

Childhood and adolescence, pregnancy, and breastfeeding are critical periods when the need for microelements increases and the body needs regular additional intake of pharmacological iodine preparations. In such cases, individual and group iodine prophylaxis is carried out, which is carried out through long-term use of iodine-containing drugs that replenish natural iodine deficiency, or vitamin-mineral complexes.

CONCLUSION

Thus, the problem of iodine supply remains relevant in all countries of the world. Iodine deficiency in the ante-, neo- and postnatal periods often has irreversible consequences, resulting in low indicators of the quality of children's health, a decrease in their intellectual development and the reproductive potential of the population as a whole. Eating foods fortified with iodine, taking potassium iodide preparations or vitamin-mineral complexes with iodine can be considered as an effective means of preventing iodine deficiency conditions in various periods of childhood.

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