

Prevention of Thyroid Diseases

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Introduction

Today, thyroid pathology ranks second among endocrine diseases in terms of prevalence, following diabetes mellitus. Thyroid diseases encompass a range of pathological phenomena that disrupt the function of this organ. Goiter is a condition characterized by an enlargement of the thyroid gland without the presence of inflammatory or oncological processes in its tissues. The term "goiter" encompasses various pathological phenomena that lead to the hypertrophy of the organ for various reasons.

| Aim of the Study

To investigate the significance of two chemical elements—iodine and selenium—and to determine their role in the development of thyroid diseases.

| Materials and Methods

To study the levels of iodine and selenium in the body and their connection to the occurrence of thyroid diseases, various analytical methods can be employed. The primary method that can be used for this research is:

Atomic Absorption Spectrophotometry (AAS): This is one of the most commonly used methods for determining the concentration of trace elements such as iodine and selenium in biological samples. The principle of the method is based on measuring the absorption of light by atoms of the element when transitioning to an excited state. AAS is widely used for determining the concentration of various metals and elements in biological, food, soil, and other samples. It is characterized by high sensitivity, accuracy, and ease of use, making it popular in laboratory research.

| Results and Discussion

Iodine:

Significance: Iodine is an essential element for the synthesis of thyroid hormones—thyroxine (T4) and triiodothyronine (T3). These hormones play a key role in regulating metabolism, growth and development, functioning of the nervous system, and other processes. To meet iodine requirements, it is recommended to consume iodized salt, seafood (such as seaweed, shrimp, fish), iodized products (e.g., bread), as well as iodine-containing supplements.

Iodine and its compounds play an important role in regulating metabolism. A deficiency of iodine disrupts normal physiological processes and hampers many enzymatic reactions. As a result, normal functioning of biological systems is impaired, and regulation of excitation and inhibition processes in the central nervous system is absent. Iodine deficiency leads to severe disorders in the human body, such as endemic goiter, immune system suppression, impaired cognitive development, and reproductive function.

Role in Thyroid Diseases: Iodine deficiency is one of the main causes of thyroid diseases such as hypothyroidism (underactive thyroid function) and goiter (enlargement of the thyroid). In countries where soil and nutrition are poor in iodine, the prevalence of these diseases is higher.

Selenium:

Significance: Selenium is an important trace element that participates in numerous biochemical processes in the body, including antioxidant defense, immune function, and thyroid function. Its sources include Brazil nuts, meat, fish, eggs, oats, and buckwheat.

Role in Thyroid Diseases: Selenium plays a crucial role in protecting the thyroid gland from oxidative stress and inflammation. A deficiency of selenium can lead to impaired thyroid function and increase the risk of developing autoimmune thyroid diseases such as Hashimoto's disease and Graves' disease.

Selenium Deficiency: Can lead to various health problems, including impaired thyroid function, weakened immune system, and increased risk of cardiovascular diseases.

Excess Selenium: Can cause toxicity (selenosis), manifesting symptoms such as nausea, diarrhea, hair loss, and neurological disorders.

Antioxidant Activity: Selenium is a component of seleno-proteins, such as glutathione peroxidase, which protect cells from oxidative stress.

Support for the Thyroid Gland: Selenium participates in the synthesis and metabolism of thyroid hormones (T3 and T4).

Immune Function: Selenium contributes to the normal functioning of the immune system, helping the body fight infections.

Protection Against Diseases: Research shows that selenium may reduce the risk of certain types of cancer and cardiovascular diseases.

Thus, both iodine and selenium deficiencies can contribute to the development of various thyroid diseases due to their influence on the production and functioning of thyroid hormones, as well as on the body's protective mechanisms. Maintaining optimal levels of these elements through proper nutrition or supplementation can help prevent or reduce the risk of developing thyroid diseases.

According to WHO statistics, approximately 2 billion people worldwide suffer from iodine deficiency, and about 750 million have been diagnosed with endemic goiter. This pronounced enlargement of the thyroid gland develops as a compensatory response to iodine deficiency in the body and environment.

As of January 1, 2020, the prevalence of endocrine diseases in Uzbekistan is as follows:

- Thyroid diseases: 44.2%
- Diabetes: 41.6%
- Obesity: 7.5%
- Other endocrine diseases: 6.7%

The incidence of thyroid diseases in our country has increased by 2% compared to 2017.

Conclusion: Goiter, as a thyroid disease, can have serious implications for human health, causing various symptoms and complications. It is essential to seek medical attention promptly for diagnosis and treatment of this condition to avoid its progression and reduce the risk of potential complications. We must remember that health is our most valuable asset; therefore, it is important to continuously monitor the condition of our thyroid gland and take all necessary measures to maintain its functions within normal limits.

Iodine is necessary for hormone production, while selenium supports their proper functioning. Thus, although both elements are important for thyroid health, the importance of iodine in preventing diseases of this organ is greater since its deficiency is more common and has more serious consequences for thyroid function.edited

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