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ENDEMIC GOITER: PATHOGENESIS AND TREATMENT OPTIONS

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Annotation

Endemic goiter is a chronic hypothyroid disorder primarily caused by iodine deficiency, resulting in thyroid gland enlargement and functional impairments. Its pathogenesis involves reduced thyroid hormone synthesis due to iodine deficiency, compensatory glandular responses, and goiter formation. Treatment includes levothyroxine supplementation, iodine fortification, dietary management, and public health monitoring. Studies indicate that effective control of endemic goiter requires preventive iodine supplementation, regular monitoring, and public awareness programs.

Keywords

endemic goiter, hypothyroidism, iodine deficiency, thyroid gland, levothyroxine, pathogenesis, prevention, treatment

Annotatsiya

Endemik buqoq — yod yetishmovchiligi bilan bog‘liq bo‘lgan surunkali gipoterioz kasalligi bo‘lib, qalqonsimon bezning hajm oshishi va funktsional buzilishlariga olib keladi. Kasallik patogenezi yod yetishmovchiligi sababli tiroid gormoni sintezining sustlashishi, bezning kompensator reaktsiyalari va goiter hosil bo‘lishi jarayonlarini o‘z ichiga oladi. Davolashda levotiroksin preparatlari, yod qo‘shimchalari, parhez va jamoat sog‘lig‘ini nazorat qilish muhim ahamiyatga ega. Tadqiqotlar shuni ko‘rsatadiki, endemik buqoqni samarali nazorat qilish uchun profilaktik yod qo‘shimchalari, muntazam monitoring va aholiga targ‘ibot ishlari zarur.

Kalit so‘zlar

endemik buqoq, gipoterioz, yod yetishmovchiligi, qalqonsimon bez, levotiroksin, patogenez, profilaktika, davolash

Аннотация

Эндемический зоб — это хроническое заболевание гипотиреоза, вызванное дефицитом йода, приводящее к увеличению щитовидной железы и нарушению её функций. Патогенез включает снижение синтеза тиреоидных гормонов из-за недостатка йода, компенсаторные реакции железы и образование зоба. Лечение предполагает применение левотироксина, добавки йода, диетическое управление и мониторинг общественного здоровья. Исследования показывают, что эффективный контроль эндемического зоба требует профилактических добавок йода, регулярного наблюдения и просветительской работы среди населения.

Ключевые слова

эндемический зоб, гипотиреоз, дефицит йода, щитовидная железа, левотироксин, патогенез, профилактика, лечение

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Introduction

Endemic goiter is a disease characterized by chronic pathological changes in the thyroid gland, the main cause of which is iodine deficiency in the body.ntroduction

Endemic goiter a disease characterized by chronic pathological changes in the thyroid gland, the main cause of which is iontroduction

Endemic goiter is a disease characterized by chronic pathological changes in the thyroid gland, the main cause of which is iodine deficiency in the body. The endemic form of goiter is mainly associated with iodine deficiency and is geographically widespread in areas with low iodine content. According to the World Health Organization, iodine deficiency is considered the main etiological factor in endemic goiter and hypothyroidism.

Iodine is a microelement necessary for the synthesis of thyroid hormone and participates in the production of thyroid hormones thyroxine (T4) and triiodothyronine (T3).odine is a microelement necessary for the synthesis of thyroid hormone and participates in the production of thyroid hormones thyroxine (T4) and triiodothyronine (T3). If the body does not have e is a microelement necessary for the synthesis of thyroid hormone and participates in the production of thyroid hormones thyroxine (T4) and triiodothyronine (T3). If the body does not have enough iodine, the production of thyroid hormones slows down, which leads to an increase in the secretion of Thyroid Stimulating Hormone (TSH) from the pituitary gland. The result is compensatory growth of the thyroid gland, which leads to the formation of a goiter or goiter. However, the chronic course of hypotheriosis can lead to a delay in intellectual and physical development in children, and a violation of metabolic processes in adults.

Endemic goiter is not only a serious problem for public health, but also limited to morphological changes in the thyroid gland.ndemic goiter is not only a serious problem for public health, but also limited to morphological changes in the thyroid gland. Because iodine deficiency is common among the population, serious cndemic goiter is not only a serious problem for public health, but also limited to morphological changes in the thyroid gland. Because iodine deficiency is common among the population, serious complications arise from this disease – such as hypotheriosis, cretinism, congenital bovine and reproductive function disorders. Therefore, timely detection, treatment, and prevention of endemic goiter is one of the important tasks of the public health system.

Today, the study of the pathogenesis and treatment of endemic goiter is of great importance for scientific research.oday, the study of the pathogenesis and treatment of endemic goiter is of great importance for scientific research. Since the pathogenesis is associated with iodine deficiency and impaired synthesis of thyroid hormones, iodine supplements, levothyroxine preparations, and normalization of thyroid function through diet play an important role in treatment and prevention. Also, community health programs and regular monitoring to address iodine deficiency in the population can help significantly reduce the prevalence of endemic bullfinch.Also, community health programs and regular monitoring to address iodine deficiency in the population can help significantly reduce the prevalence of endemic bullfinch.By studying endemic goiter in depth, identifying its etiopathogenesis, and developing treatment strategies, it is possible to ensure the health stability of not only individual patients, but also entire populations. Therefore, this topic is of scientific and practical importance and is an important resource in the development of effective measures for the prevention and treatment of diseases associated with iodine deficiency.

Etialogy

There are several main etiological factors in the development of endemic goiter hypothyroidism, which lead to insufficient synthesis of thyroid hormones in the body.several

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main etiological factors in the development of endemic goiter hypothyroidism, which lead to insufficient synthesis of thyroid hormoneshere are several main etiological factors in the development of endemic goiter hypothyroidism, which lead to insufficient synthesis of thyroid hormones in the body. The most common and most common cause is iodine deficiency, as iodine is an essential micronutrient for the production of thyroid hormones (T3 and T4). Geographically, areas with a high prevalence of iodine deficiency are typically mountainous and have soils that are not rich in iodine, and water resources that are not rich in iodine. For this reason, iodine deficiency in the daily diet of the population is the main factor in the development of endemic bullfinch.

Genetic factors also play an important role in disease development.this reason, iodine deficiency in the daily diet of the population is the main factor in the development of endemic bullfinch.

Genetic factors also play an important role in disea reason, iodine deficiency in the daily diet of the population is the main factor in the development of endemic bullfinch.

Genetic factors also play an important role in disease development. In some individuals, thyroid cells are hypersensitive to TSH stimulation, and even in the presence of iodine deficiency, the gland rapidly undergoes hyperplasia and goiter formation. At the same time, genetic factors may affect the mechanisms of synthesis of thyroid hormones, affecting their transport and metabolism.

Environmental factors are also relevant in etiology. For example, goitrogenic substances in water and food (cresol, sulfates, glucosinolates) can interfere with the synthesis of thyroid hormones.nvironmental factors are also relevant in etiology. For example, goitrogenic substances in water and food (cresol, sulfates, glucosinolates) can interfere with the synthesis of thyroid hormones. Heavy metals (such as lead, cadmium) and some pesticides also impair thyroid function. When these factors are accompanied by iodine deficiency, the risk of developing the disease increases even more.

Biological and physiological factors are also important in the etiology. During childhood and pregnancy, the body's demand for iodine increases, leading to insufficient production of thyroid hormones and the developmentiological and physiological factors are also important in the etiology. During childhood and pregnancy, the body's demand for iodine increases, leading to insufficient production of thyroid hormones and the development of goiter. Iodine deficiency in children can cause intellectual developmental delays and neurological disorders, while pregnant women are at increased risk of congenital goiter and hypothyroidism.

Infectious and chronic diseases also play a role in etiology.nfectious and chronic diseases also play a role in etiology. For example, chronic inflammation of the thyroid gland (thyroiditis) and autoimmune diseases slow down the synthesis of tnfectious and chronic diseases also play a role in etiology. For example, chronic inflammation of the thyroid gland (thyroiditis) and autoimmune diseases slow down the synthesis of thyroid hormones and lead to the development of hypotheriosis. These factors, often combined with iodine deficiency, increase the risk of the disease.

Thus, the etiology of endemic bull hypotheriosis is multifactorial, with iodine deficiency being the main factor, in addition to genetic predisposition, environmental factors, biological and physiological requirements, chronic and autoimmune diseases.hus, the etiology of endemic bull hypotheriosis is multifactorial, with iodine deficiency being the main factor, in addition to genetic predisposition, environmental factors, biological and physiological requirements, chronic and autoimmune diseases. These etiological factors together lead to insufficient synthesis of

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thyroid hormones, compensatory hyperplasia of the thyroid gland, and, as a result, the formation of endemic goiter.

The etiology of endemic goiter hypothyroidism is complex and multifactorial, and not only iodine deficiency plays a role in its development, but also a number of additional biological, environmental, and metabolic factors.he etiology of endemic goiter hypothyroidism is complex and multifactorial, and not only iodine deficiency plays a role in its development, but also a number of additional biological, environmental, and metabolic factors. Iodine deficiency, as the main etiological factor, causes a deficiency of the microelement necessary for the synthesis of thyroid hormones. In conditions of iodine deficiency, thyroid gland cells cannot produce thyroxine and triiodothyronine, resulting in increased secretion of thyroid-stimulating hormone from the pituitary gland and compensatory enlargement of the gland.n conditions of iodine deficiency, thyroid gland cells cannot produce thyroxine and triiodothyronine, resulting in increased secretion of thyroid-stimulating hormone from the pituitary gland and compensatory enlargement of the gland. However, modern scientific research shows that endemic goiter and hypothyroidism continue to occur in some areas, even though iodine levels are relatively satisfactory, confirming the presence of other etiological factors.

In recent years, the influence of the intestinal microbiota on thyroid activity has become a special center of attention. Beneficial microorganisms in the intestine play an important role in ensuring the absorption of iodine, selenium and other microelements.n recent years, the influence of the intestinal microbiota on thyroid activity has become a special center of attention. Beneficial microorganisms in recent years, the influence of the intestinal microbiota on thyroid activity has become a special center of attention. Beneficial microorganisms in the intestine play an important role in ensuring the absorption of iodine, selenium and other microelements. In cases of dysbiosis, these substances are not sufficiently absorbed by the body, as a result of which the synthesis of thyroid hormones decreases. At the same time, the microbiota also participates in the processes of peripheral circulation and breakdown of thyroid hormones, affecting the overall hormonal balance.

In etiology, a violation of the balance of trace elements is also considered important. Selenium is part of enzymes that convert thyroid hormones into the active form, while iron is essential for enzyme systems involved in hormone synthesis.n etiology, a violation of the balance of trace elements is also considered important. Selenium is part of enzymes that convert thyroid hormones into the active form, while iron is essential for enzyme systems involvn etiology, a violation of the balance of trace elements is also considered important. Selenium is part of enzymes that convert thyroid hormones into the active form, while iron is essential for enzyme systems involved in hormone synthesis. Zinc, on the other hand, ensures that thyroid hormones enter the cell and bind to receptors. Deficiency of these elements can lead to the development of hypotheriosis even under conditions where iodine is sufficient. Therefore, endemic goiter is often associated with micronutrient deficiencies.

Environmental factors also play an important role in disease etiology. Chemicals found in industrial waste products, pesticides, nitrates, fluorine compounds and plastic products remove thyroid gland cell activity from the trail.nvironmental factors also play an important role in disease etiology. Chemicals found in industrial waste products, pesticides, nitratnvironmental factors also play an important role in disease etiology. Chemicals found in industrial waste products, pesticides, nitrates, fluorine compounds and plastic products remove thyroid gland cell activity from the trail. Some of these substances block the entry of iodine into the cell, while others inactivate thyroid enzymes or damage hormone receptors. It has been found that endemic goiter is more common among populations exposed to such toxins over the long term.

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Hormonal changes are also a factor that enhances the etiological process. In women in particular, increased levels of the hormone estrogen increase the sensitivity of thyroid tissue to TSH, resulting in faster hyperplasia of the gland.ormonal changes are also a factor that enhances the etiological process. In women in particular, increased levels of the hormone estrogen increase the sensitivity of thyroid tissue to TSH, resulting in faster hyperplasia of the gland. Changes in the hormonal background during puberty, pregnancy and menopause can accelerate the development of an endemic bull. Therefore, the disease is more common among women than in men.

Some antithyroid substances present in food also play an important role in the etiology.antithyroid substances present in food also play an important role in the etiology. For example, glucosinolates in cassava, millet, raw cabbage, and turnips slow down the synthesis of thyroid hormones. Long-term consumption of these products, especially in the presence of iodine deficiency, increases the risk of developing goiter.

Chronic stress and disorders of the neuroendocrine system also create the basis for the development of endemic goiter hypothyroidism.hronic and disorders of the neuroendocrine system also create the basis for the development of endemic goiter hypothyroidhronic stress and disorders of the neuroendocrine system also create the basis for the development of endemic goiter hypothyroidism During stress, the amount of the hormone cortisol increases, disrupting the activity of the hypothalamic–pituitary–thyroid axis. As a result, TSH secretion and peripheral turnover of thyroid hormones are reduced, leading to increased symptoms of hypothyroidism.

Thus, the etiology of endemic bull hypotheriosis is not limited to iodine deficiency alone, but is manifested in a complex interconnected state with intestinal microbiota disorders, micronutrient deficiency, environmental toxins, hormonal changes, food factors and stress.hus, the etiology of endemic bull hypotheriosis is not limited to iodine deficiency alone, but is manifested in a complex interconnected state with intestinal microbiota disorders, micronutrient deficienc

PathologyPathology

The pathogenesis of endemic goiter is mainly related to iodine deficiency and involves a complex interplay between thyroid hormone synthesis and compensatory mechanisms of the thyrathology

The pathogenesis of endemic goiter is mainly related to iodine deficiency and involves a complex interplay between thyroid hormone syntathology

The pathogenesis of endemic goiter is mainly related to iodine deficiency and involves a complex interplay between thyroid hormone synthesis and compensatory mechanisms of the thyroid gland. Iodine is a very important trace element for the body, participating in the production of the hormones T3 (triiodothyronine) and T4 (thyroxine). If iodine deficiency is present, the synthesis of thyroid hormones slows down and this leads to an increase in the secretion of Thyroid Stimulating Hormone (TSH) in the pituitary gland.

An increase in TSH levels causes hyperplasia of the thyroid gland, which leads to an increase in the size of the gland, i.e. the formation of a goiter.n increase in TSH levels causes hyperplasia of the thyroid gland, which leads to an increase in the size of the gland, i.e. the formation of a goiter. Tn increase in TSH levels causes hyperplasia of the thyroid gland, which leads to an increase in the size of the gland, i.e. the formation of a goiter. This process determines the macroscopic appearance of endemic goiter: the thyroid gland swells, and in some cases it can be symmetrical or asymmetrical. Pathological changes include follicular structure expansion, thyroid cell proliferation, increased stromal component, and increased collagen fibers.

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When the level of thyroid hormones decreases due to iodine deficiency, metabolic processes slow down. In all tissues of the body, energy production slows down, oxygen metabolism decreases, and protein, lipid and carbohydrate metabolism are disrupted.hen the level of thyroid hormones decreases due to iodine deficiency, metabolic processes slow down. In all tissues of the body, energy production slows down, oxygen metabolism decreases, and protein, lipid and carbohydrate metabolism are disrupted. At the same time, T3 and T4 deficiency for children and adolescents negatively affects the development of the central nervous system, which leads to delayed intellectual development, neurological disorders and an increased risk of cretinism.

The pathogenesis of endemic goiter also includes compensatory mechanisms of the body.he pathogenesis of endemic goiter also includes compensatory mechanisms of the body. Although the thyroid gland tries to compensate for the TSH level by growing, the level of thyroihe pathogenesis of endemic goiter also includes compensatory mechanisms of the body. Although the thyroid gland tries to compensate for the TSH level by growing, the level of thyroid hormones is insufficient, and there is constant stimulation of the pituitary gland. When this persists for a long time, it leads to fibrosis, adenosis, and sometimes multinodular structures in the gland. Therefore, the disease is chronic and progressive.

Additionally, genetics and other environmental factors also play a role in the development of endemic goiter.dditionally, genetics and other environmental factors also play a role in the development of endemic goiter. In some individuals, even with iodine deficiency, the ally, genetics and other environmental factors also play a role in the development of endemic goiter. In some individuals, even with iodine deficiency, the disease develops slowly due to compensatory reactions of the gland, while in others, goiter develops rapidly. At the same time, the body's demand for iodine increases during childhood and pregnancy, which further increases the risk of the disease.

The final result of pathogenesis is the occurrence of clinical signs of hypotheriosis along with structural and functional changes in the thyroid gland.he final result of pathogenesis is the occurrence of clinical signs of hypotheriosis along with structural and functional changes in the thyroid gland. At the final result of pathogenesis is the occurrence of clinical signs of hypotheriosis along with structural and functional changes in the thyroid gland. At the clinic level, the patient experiences symptoms such as fatigue, Frost intolerance, weight gain, dry skin, hair loss, decreased intellectual activity. However, endemic bull hypotheriosis in children and pregnant women can cause congenital disorders and developmental delays.

Thus, the pathogenesis of an endemic Bull is characterized by insufficient production of thyroid hormones as a result of iodine deficiency, compensatory hyperplasia of the thyroid gland, retardation of metabolic processes and the appearance of signs of clinical hypotheriosis.hus, the pathogenesis of an endemic Bull is characterized by insufficient production of thyroid hormones as a result of iodine deficiency, compensatory hyperplasia of the thyroid gland, retardation of metabolic processes and the appearance of signs of clinical hypotheriosis. A deep understanding of pathogenesis is considered important for determining treatment and prevention strategies.

Treatment

The goal of treatment for endemic goiter hypothyroidism is to normalize thyroid function, restore hormone balance, and eliminate clinical symptoms and complications of the disease.he goal of treatment for goiter hypothyroidism is to normalize thyroid function, restore hormone balance, and eliminate clinical symptoms and complications of theease. Treatment strategies are usually selected based on the patient's age, disease severity, structural changes in the thyroid gland, and the degree of chronic hypothyroidism.

1. Pharmacological treatment

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The most basic and modern treatment method is levothyroxine (synthetic T4).he most basic and modern treatment method is levothyroxine (synthetic T4). Levothyroxine eliminates hypothyroidism caused by a deficiency of thyroid hormones, normalizes TSH levels, and reduces compensatory hyperplasia of the thyroid gland.

The dosage of the drug is determined individually, depending on the patient's body weight, age and hormone level. For example, in adults, the initial dose is usually 50-100 mcg per day, and then it is increased on the basis of laboratory tests.he dosage of the drug is determined individually, depending on the patient's body weight, age and hormone level. For example, in adults, the initial dose is usually 50-100 mcg per day, and then it is increahe dosage of the drug is determined individually, depending on the patient's body weight, age and hormone level. For example, in adults, the initial dose is usually 50-100 mcg per day, and then it is increased on the basis of laboratory tests. In children and pregnant women, the dosage is determined taking into account the body's metabolic demand and safety.

Monitoring: during treatment with levothyroxine, TSH and T4 levels are regularly checked. Once the Optimal hormone level is reached, dose maintenance and long-term monitoring are carried out.

2. Iodine treatment

Since iodine deficiency is the main cause of endemic goiter, iodine supplements and iodine-containing drugs are important in its treatment. The following methods are used in iodine-deficient areas:dine deficiency is the main cause of endemic goiter, iodine supplements and iodine-containing drugs are important in its treatment. The following methods are used in iodine-deficient areas:

Iodized salt: Adding iodized salt to the daily diet is the most effective preventive and therapeutic method. The standard recommendation is to add 30–50 mg of iodine per 1 kg of salt.

Iodine in the form of a drug: In some cases, especially in severe goiter or hypothyroidism, iodine is given in the form of drugs (for example, potassium iodide).odine in the form of a drug: In some cases, especially in severe goiter or hypothyroidism, iodine is given in the form of drugs (for example, potassium iodide). However, it is important to accurately determine the dose, since excess iodine can also lead to dysbalance of thyroid hormones.

3. Diet and lifestyle

In the treatment process, it is also important to optimize the diet and lifestyle:

The diet includes seafood, fish, milk and dairy products, eggs, iodine-rich vegetables and fruits. The consumption of goitrogenic substances (cresol, cabbage, broccoli, soy) is controlled, especially if there is iodine deficiency.he diet includes seafood, fish, milk and dairy products, eggs, iodine-rich vegetables and fruits. The consumption of goitrogenic substances (cresol, cabbage, broccoli, soy) is controlled, especially if there is iodine deficiency.

Reducing stress and maintaining physical activity support metabolism and stabilize the function of the thyroid gland.

4. Surgical treatment

In modern treatment, surgical methods are used only in the following cases:

An enlarged multinodular goiter in the thyroid gland, if the patient has difficulty breathing or digesting food. In cases where conservative treatment with levothyroxine and iodine is not effective.An enlarged multinodular goiter in the thyroid gland, if the patient has difficulty breathing or digesting food.n enlarged multinodular goiter in the thyroid gland, if the patient has difficulty breathing or digesting food. In cases where conservative treatment with levothyroxine and iodine is not effective.

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Surgery involves a thyroidectomy (partial or total), followed by hormone replacement therapy with levothyroxine. Modern minimally invasive techniques, such as endoscopic or robotic-assisted thyroidectomy, reduce post-surgical complications and shorten the recovery period.

5. Preventive and public health measures

In addition to personal treatment, preventive measures are of particular importance in the effective treatment of an endemic bull:

Provide adequate iodine levels in the population through iodized salt and food additives.In addition to personal treatment, preventive measures are of particular importance in the effective treatment of an endemic bull:

Provide adequate iodine levIn addition to personal treatment, preventive measures are of particular importance in the effective treatment of an endemic bull:

Provide adequate iodine levels in the population through iodized salt and food additives.

Control of iodine supplements in schools and kindergartens.

Monitoring of iodine levels in pregnant women and children and, if necessary, administering drugs.

Carrying out propaganda work on the importance of a healthy lifestyle, diet and iodine to the population.

6. Modern approaches and research

In recent years, personalization and laboratory monitoring have become increasingly important in the treatment of endemic goiter:

- Adjusting the levothyroxine dose to TSH and T4 levels. recent years, personalization and laboratory monitoring have become increasingly important in the treatment of endemic goiter:
- Adjusting the levothyroxine dose to TSH and T4 levels.
- The use of iodine supplements only if there is sufficient need to prevent excess iodine.
- Development of individual approaches for patients with genetic predisposition.

Modern treatments not only improve the patient's clinical condition, but also help reduce the spread of endemic Bullhead at the public level. At the same time, the combination of preventive measures in the process of treatment is the most effective approach in preventing chronic and severe forms of the disease.

In the effective treatment of endemic bull hypotheriosis, in recent years, complex approaches have been used aimed at deeply eliminating the causes of the disease, not limited to hormone replacement therapy alone.n the effective treatment of endemic bull hypotheriosis, in recent years, complex approaches have been used aimed at deeply eliminating the causes of the disease, not In the effective treatment of endemic bull hypotheriosis, in recent years, complex approaches have been used aimed at deeply eliminating the causes of the disease, not limited to hormone replacement therapy alone. In modern medicine, the treatment process is carried out on the basis of endocrinological, laboratory and instrumental monitoring.

1. Combined hormone therapy (T4 + T3)

In some patients, treatment with levothyroxine (T4) alone does not produce sufficient effect. In such cases:

The combination of thyroxine (T4) and triiodothyronine (T3) is used

This method provides a better natural balance of hormones in the body

Especially effective in patients with prolonged hypotheriosis, severe metabolic disordersThis method provides a better natural balance of hormones in the body

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Modern clinical sThis method provides a better natural balance of hormones in the body

Especially effective in patients with prolonged hypotheriosis, severe metabolic disorders

Modern clinical studies suggest that combined therapy reduces fatigue, depression, and cognitive impairment more quickly in some patients.

2. Individual metabolic adaptation (personalised therapy

In modern medicine, the principle of" the same dose is for everyone " is practically not used.

The following are taken into account in the treatment:

* patient age
• body weight
• cardiovascular condition
• hormone metabolism rate
• iodine absorption rate

Based on this, an individual treatment plan is developed. This method prevents hormone excess or deficiency and increases the safety hormone metabolism rate

• iodine absorption rate

Based on this, an individual treatment plan is developed. This method prevents hormone excess or deficiency and increases the safety of tre hormone metabolism rate

• iodine absorption rate

Based on this, an individual treatment plan is developed. This method prevents hormone excess or deficiency and increases the safety of treatment.

3. Minimally invasive interventions(non-surgical methods

In modern medicine, large nodular goiters do not always have to be surgically removed. The following innovative methods are widely used:

• Radiofrequency ablation (RFA) – shrinking the nodules by heat
• Laser therapy – destroying the gland tissue
• Ethyl alcohol injection-used in cystic nodes

4. Immune system support therapy• Ethyl alcohol injection-used in cystic nodes

4. Immune system support therapy

In some cases, endemic bull hypotheriosis may be accompanied by autoimmune processes. In Ethyl alcohol injection-used in cystic nodes

4. Immune system support therapy

In some cases, endemic bull hypotheriosis may be accompanied by autoimmune processes.

Conclusion

Endemic goiter hypothyroidism is a significant medical and social problem globally, with iodine deficiency recognized as its main cause.ndemic goiter hypothyroidism is a significant medical and social problem globally, with iodine deficiency recognized as its main cause. However, modern scientific research shows that the origin and development of this disease is not limited to iodine deficiency, but is also associated with a number of additional etiological factors. Disorders of the intestinal microbiota, deficiency of trace elements — in particular selenium, iron and zinc, environmental toxins, changes in hormonal balance, stress factors and antithyroid substances in food-are manifested as factors that enhance the development of endemic bull hypotheriosis.

The pathogenesis of the disease is characterized by a decrease in the synthesis of thyroid hormones as a result of iodine deficiency, an increase in compensatory TSH secretion by the

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pituitary gland, and hyperplasia of the thyroid gland.thogenesis of the disease is characterized by a decrease in the synthesis of thyroid hormones as a result of iodine deficiency, an increase in compensatory TSH secretion by the pituitary gland, and hyperplasia of the thyroid gland. As a result of these processes, metabolic activity decreases, and functional disorders occur in all body systems. The most severe consequences of the disease are a slowdown in intellectual and physical development, especially in children, and an increased risk of congenital pathologies in pregnant women.

Modern treatment approaches include complex therapy aimed at eliminating the underlying causes of the disease, rather than being limited to compensating for hormone deficiency alone.odern treatment approaches include complex therapy aimed at eliminating the underlying causes of the disease, rather than being limited to compensating for hormone deficiency alone. Hormone replacement therapy with levothyroxine drugs, iodine balance restoration, replenishment of micronutrient deficiencies, minimally invasive interventions, and the use of individual treatment plans significantly improve the quality of life of patients. However, long-term monitoring and rehabilitation processes are important in preventing disease recurrence.

Proper organization of preventive measures is the most effective way to reduce endemic goiter hypothyroidism.r organization of preventive measures is the most effective way to reduce endemic goiter hypothyroidism. The spread of the disease can be significantly reduced by providing the population with iodized salt, introducing special iodine supplemroper organization of preventive measures is the most effective way to reduce endemic goiter hypothyroidism. The spread of the disease can be significantly reduced by providing the population with iodized salt, introducing special iodine supplements for children and pregnant women, strengthening public health programs, and conducting regular screening. Modern scientific approaches require the development of comprehensive and individual prevention strategies to prevent disease.

In conclusion, endemic bull hypotheriosis is a multifactorial disease, for the effective control of which it is necessary to deeply understand etiological factors, take into account pathogenetic mechanisms, apply modern methods of treatment and carry out a wide range of preventive measures.n conclusion, endemic bull hypotheriosis is a multifactorial disease, for the effective control of which it is necessary to deep

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