Western European Journal of Medicine and Medical Science
Volume 2, Issue 10, October, 2024
https://westerneuropeanstudies.com/index.php/3
ISSN (E): 2942-1918 Open Access| Peer Reviewed

CLINICAL ASPECTS OF THYROTOXICOSIS SYNDROME. MODERN TREATMENT APPROACHES

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Annotation

The thyroid gland is a small endocrine organ located in the neck, closely adjacent to the trachea and surrounded by large vessels. It has an active blood supply, several times more active than that of the heart muscle. This organ produces hormones responsible for metabolism and other biological processes and regulates the vital activity of the entire body.

Key words: pituitary gland, thyretoxicosis, hyperthyroidism, Graves' disease, thionamides.

Thyrotoxicosis is a syndrome caused by a persistent and long-term excess of thyroid hormones in the body, which develops in various diseases and pathological conditions of the body.

Thyrotoxicosis is observed in a number of thyroid diseases, such as diffuse toxic goiter (DTZ), toxic adenoma, multinodular toxic goiter, subacute thyroiditis (first 1-2 weeks), autoimmune thyroiditis ("chasitoxicosis"), postpartum (silent, painless) thyroiditis, follicular cancer. Among other causes of thyrotoxicosis not related to thyroid damage, the following are most often named: strumaovarii (ectopic thyroid tissue), pituitary adenoma, chorionepithelioma, follicular cancer metastases, artificial thyrotoxicosis, etc.

The following classification of thyrotoxicosis syndrome is most often used:
1. Thyrotoxicosis due to increased
thyroid hormones:
• Graves' disease;
• multinodular toxic goiter;
• toxic adenoma;
• iodine-induced thyrotoxicosis;
• TSH-producing pituitary adenoma;
• syndrome of inadequate TSH secretion (resistant
thyrotrophs to thyroid hormones);
• gestational thyrotoxicosis;
• non-autoimmune autosomal dominant hyper-
thyroidism;
• trophoblastic thyrotoxicosis.
2. Thyrotoxicosis caused by the production of thyroid hormones outside the thyroid gland:
• struma ovarii (ovarian tumor that produces thyroid hormones);
• metastases of highly differentiated thyroid cancer.
3. Thyrotoxicosis not associated with hyperproduction of thyroid hormones:
• medication (amiodarone, iodine-containing contrast agents, interferon α);

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• iatrogenic thyrotoxicosis;
• stage of de Quervain's subacute thyroiditis;
• infarction of thyroid adenoma;
• radiation thyroiditis;
• the stage of AIT development;
• increased sensitivity of tissues to thyroid hormones.

There are manifest and subclinic thyrotoxicosis. Subclinical thyrotoxicosis is determined by a decrease in TSH levels and normal levels of thyroxine (T4) and triiodothyronine (T3), in these patients the symptoms of thyretoxicosis may be
be present or not pronounced. The persistent nature of the changes should be confirmed by repeated measurement in 3-6 months. The most common cause of subclinical thyrotoxicosis is multinodular toxic goiter. Subclines-
In 2010, the Clinical Guidelines of the Association of Clinical Endocrinologists and the American Clinical Guidelines were published.
Rheoidological Association, according to which it is necessary to treat subclinical thyrotoxicosis with a persistent decrease in TSH less than 0.1 mU/L in patients over 65 years of age, postmenopausal women not receiving HRT or bisphosphonates, in patients with high cardiovascular risk, heart disease or osteoporosis, and patients with symptoms of thyrotoxicosis. With TSH, it is consistently below the lower limit of normal, but
≥0.1 mU/L is discussed treatment for persons over 65 years of age and patients with cardiovascular disease or symptoms of thyrotoxicosis. Treatment is the same as for manifest thyrotoxicosis.

The pathogenesis of clinical symptoms is mainly due to the effect of excess thyroid hormones on various organs and systems of the body. The complexity and multiplicity of factors involved in the development of pathological changes in the thyroid gland also determine the variety of clinical manifestations of thyrotoxicosis. It should be remembered that subjectively, the general condition of a patient with thyrotoxicosis syndrome does not correspond to objective disorders of the functions of organs and systems, which are much more serious than it may seem during the initial examination.

When analyzing complaints and the results of an objective study, it is possible to identify a number of clinical syndromes. The most characteristic triad of symptoms is goiter, exophthalmos, tachycardia. A variety of symptoms and systems can be grouped into specific syndromes.

The syndrome of damage to the cardiovascular system is characterized by tachycardia, persistent sinus or persistent atrial fibrillation, paroxysmal atrial fibrillation against the background of sinus tachycardia or normal sinus rhythm, accompanied by extrasystole; high pulse pressure; the development of dyshormonal myocardial dystrophy ("thyrotoxic heart"), circulatory failure.

In the syndrome of lesions of the central and peripheral nervous system, chaotic, unproductive activity, increased excitability, decreased concentration, tearfulness, fatigue, sleep disorders, tremor of the whole body (telegraph column sign) and especially of the fingers (Marie's sign), increased sweating, redness of the face, persistent red dermographism, increased tendon reflexes.

Ocular symptoms. The cause of the development of ocular symptoms is considered to be an increase in the tone of the muscle fibers of the eyeball and upper eyelid due to a violation

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of autonomic innervation under the influence of an excess of T3 and T4 in the blood. During the examination, characteristic symptoms are distinguished:

Stelvag's sign – rare blinking of the eyelids;

Graefe's sign – the upper eyelid lags behind the iris when fixing the gaze on an object slowly moved downwards, while a white strip of sclera remains between the upper eyelid and the iris;

Kocher's sign – similar to Graefe's sign, but when fixing the gaze on an object slowly moving upwards, in connection with which a white stripe of sclera remains between the lower eyelid and the iris;

Dalrymple's sign (exophthalmos) – widening of the eye fissure with the appearance of a white stripe of sclera between the iris and the upper eyelid;

Moebius sign – loss of the ability to fix the gaze at a close distance: due to the weakness of the adductor eye muscles, the eyeballs fixed on a nearby object diverge and take their original position;

Geoffroy's sign – the absence of a wrinkle in the forehead when looking up;

Botkin's sign is a fleeting wide opening of the eye slits when fixing the gaze;

Rosenbach's sign – fine tremor of closed eyelids;

the Repnev-Melekhov symptom is an angry look.

The listed ocular symptoms must be differentiated from autoimmune ophthalmopathy.

Catabolic disorders syndrome is manifested by weight loss against the background of increased appetite, low-grade fever, myopathy, and sometimes osteoporosis.

Syndrome of damage to the digestive organs. Attacks of abdominal pain, vomiting, unstable stools with a tendency to diarrhea, sometimes yellowing of the skin, which is associated with impaired liver function (up to the development of thyrotoxic hepatitis), etc.

Ectodermal disorders syndrome – characteristic exfoliation and increased fragility of nails, brittleness, hair loss, etc.

The syndrome of damage to other endocrine glands is also often observed in toxic goiter. It is characterized by adrenal gland dysfunction, which leads to a decrease in vascular tone, the appearance of pigmentation around the eyes (Jellinek's sign); ovarian dysfunction with menstrual irregularities up to amenorrhea, the development of fibrocystic mastopathy, sometimes with galactorrhea; Men may develop gynecomastia.

Impaired glucose tolerance, increased breakdown of antidiuretic hormone (causes excessive thirst and increased diuresis) may be observed.

Adrenal gland damage or the development of diabetes mellitus in DTZ are caused not only by thyrotoxicosis, but can also develop as a result of a combination of DTZ with other autoimmune diseases.

Ultrasound shows a diffuse enlargement of the thyroid gland, the parenchyma is moderately hypoechogenic, homogeneous in structure, and the contours are clear. A significantly increased blood supply to the gland tissue is characteristic.

Scanning of the thyroid gland reveals diffuse increased accumulation of radiopharmaceuticals throughout the gland tissue.

High levels of T3 and T4 are detected in the blood, while the TSH level (determined by highly sensitive methods) is reduced or not detectable. In most patients, thyroid-stimulating autoantibodies (antibodies to the TSH receptor) are detected.

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The minimum diagnostic algorithm for the examination of DTZ includes the analysis of complaints and clinical symptoms, ultrasound in combination with fine-needle biopsy, hormonal blood testing, and determination of the level of antibodies to the TSH receptor.

Diseases accompanying diffuse toxic goiter. Ocular symptoms in DTZ should be differentiated from autoimmune ophthalmopathy (AOP). AOP is a lesion of periorbital tissues of autoimmune origin, clinically manifested by disorders of the oculomotor muscles, trophic disorders, and often exophthalmos. Currently, it is regarded as an independent autoimmune disease. AOP occurs in about 40-50% or more of patients with DTZ, more often in men

Conservative treatment is used for DTZ: 1) drug therapy (antithyroid drugs, beta-blockers, tranquilizers and sedatives, iodine preparations, etc.); 2) radioactive iodine (I131) and 3) surgical treatment – subtotal resection of the thyroid gland.

Conservative treatment is the preferred method of therapy for diffuse toxic goiter in Europe (including in our country). Pathogenetic treatment is aimed at inhibition of intrathyroid hormone genesis, blockade of the synthesis of thyroid-stimulating autoantibodies, peripheral conversion of T4 to T3. For this purpose, thyrostatic drugs mercazolil (methimazole, thiamazole), propyl-thiouracil (propicil) are widely used. Depending on the severity of thyrotoxicosis, mercazolil is prescribed at 10-60 mg/day, propicil at 100-400 mg/day and more. When using a monoregimen with these drugs, the treatment tactics are carried out according to the principle of "block and replace", i.e., hor-monogenesis is blocked with mercazolil until a euthyroid state is reached, after which the dose is gradually reduced to a maintenance dose of 5-10 mg/day (blockade of the synthesis of thyroid-stimulating antibodies) and additional replacement therapy with L-thyroxine (25-50 μg/day) is administered. The course of treatment is carried out for 1-1.5 years (in children - 2 years), under the control of the level of TSH, thyroid hormones, thyroid-stimulating antibodies every 3-4 months.

It is advisable to combine treatment with antithyroid drugs with beta-ad-renoblockers (anaprilin, obzidan, atenolol), which allows you to achieve clinical remission faster. Beta-blockers are indicated for patients with persistent tachycardia, extrasystole, and atrial fibrillation. Ana-prilin is prescribed at 40-60 mg/day, if necessary, the dose can be increased.

In a severe form of the disease, in combination with endocrine ophthalmopathy, adrenal insufficiency, glucocorticosteroids (prednisolone 5-30 mg/day, etc.) are prescribed.

To stabilize cell membranes, reduce the stimulating effect of TSH and thyroid-stimulating antibodies, as well as reduce the content of T3 and T4, lithium carbonate is used at 0.9-1.5 g/day.

It is advisable to prescribe tranquilizers and sedatives. Surgical treatment as a radical therapy option is indicated when conservative treatment of patients with severe Graves' disease is ineffective or impossible, in combination with

thyroid nodules, with a large goiter or its retrosternal position, toxic adenoma and multinodular toxic goiter, with a relapse of thyrotoxicosis against the background (or after discontinuation) of drug therapy. The advantage of this method is

treatment is the rapid achievement of a euthyroid state. The main complications of surgical treatment include recurrent laryngeal paresis

nerve and hypoparathyroidism. The incidence of complications depends on the qualifications of the surgeon and less than 1% of patients are found in specialized hospitals. Other complications: transient hypocalcemia, postoperative bleeding, wound infection, keloid scarring. Postoperative hypothyroidism

should not be considered a complication, but rather a natural outcome of surgical treatment.

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Another option for radical treatment is radioiodine therapy. Indications for radioactive iodine therapy are: ineffectiveness of conservative therapy of Graves' disease, recurrence of thyrotoxicosis after surgical treatment, impossibility of long-term conservative therapy due to allergies, leukopenia, the presence of pronounced cardiovascular disorders in patients with small thyroid gland, impossibility of surgical treatment, toxic
adenoma or multinodular toxic goiter. Practical experience shows the need to achieve euthyroidism with thyrostatic drugs before treatment with 131I treatment with their withdrawal one week before the procedure. Numerous studies
have proven that treatment with radioactive iodine does not increase the risk of leukemia, thyroid cancer and other organs. After treatment with radioactive iodine, the course of EOP may be aggravated, so a severe course of ophthalmopathy may be a contraindication to this method of treatment. Another common side effect is transient thyrotoxicosis in the first few weeks after radioactive iodine therapy due to the release of thyroid hormones from the destroyed
thyroid follicles. Pregnancy and lactation should be considered absolute contraindications to treatment with radioactive iodine. Thus, the choice of treatment method depends on the etiology of the disease, the size and location of the thyroid gland, the presence of complications of thyrotoxicosis and concomitant pathology. For diseases associated with
hyperproduction of thyroid hormones in the thyroid gland, conservative therapy with thyrostatics, radioiodine therapy with 131I or surgical treatment is indicated. Diseases associated with the destruction of the thyroid parenchyma and the release of previously synthesized hormones or their extrathyroid production, as a rule, do not require specialized thyrostatic therapy.

Literature

1. Petunina N.A., Trukhina L.V. Diseases of the thyroid gland. M.:GEOTAR-Media, 2011; 74–106
2. Abraham-Nordling M., TЂrring O., Lantz M. et al. Incidence of hy-perthyroidism in Stockholm, Sweden, 2003–2005. Eur J Endocrinol.2008; 158: 823–827.
3. Braverman L.E., Utiger R.D. The thyroid: a Fundamental and clinicaltext. 9th ed Phylodelphia: Lippicott, Williams, Wilkins. 2005; 665–684.
4. Brownlie B.E.W., Wells J.E. The epidemiology of thyrotoxicosis inNew Zealand: incidence and geographical distribution in North Canter-bury, 1983–1985. Clin Endocrinol (Oxf). 1990; 33: 249.
5. Laurberg P., Pedersen K.M., Vestergaard H., Sigurdsson G. High incidence of multinodular toxic goitre in the elderly population in a low iodine intake area vs. high incidence of Graves' disease in the young in a high iodine intake area: comparative surveys of thyrotoxicosis epide-miology in East-Jutland Denmark and Iceland. J Intern Med. 1991; 229:415–420.
6. Bahn R.S., Burch H.B., Cooper D.S., Garber J.R. et al. Hyperthy-roidism and other causes of thyrotoxicosis: management guidelines of the American Thyroid Association and American Association of Clinical Endocrinologists. Endocr Pract. 2011 May-Jun; 17 (3): 456–520.
7. Mitsiades N., Poulaki V., Tseleni-Balafouta S. et al. Fas ligand ex-pression in thyroid follicular cells from patients with thionamide-treated Graves' disease. Thyroid. 2000; 10: 527–532.
8. Zantut-Wittmann D.E., Tambascia M.A., da Silva Trevisan M.A. etal. Antithyroid drugs inhibit in vivo HLA-DR expression in thyroid follicu-

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lar cells in Graves' disease. Thyroid. 2001; 11: 575–580.
9. Wang P.W., Luo S.F., Huang B.Y. et al. Depressed natural killer acti-vity in Graves' disease and during antithyroid medication. Clin Endocri-nol (Oxf). 1988; 28: 205–214.
10. Koenig R.J. Regulation of type I iodothyronine deiodinase in he-alth and disease. Thyroid. 2005; 15: 835–840.
11. Fumarola A., Di Fiore A., Dainelli M., Grani G., Calvanese A. Medi-cal treatment of hyperthyroidism: state of the art. Exp Clin Endocrinol Diabetes. 2010 Nov; 118 (10): 678–84.
12. Abraham P., Acharya S. Current and emerging treatment options for Graves' hyperthyroidism. Ther Clin Risk Manag. 2010 Feb; 2: 6: 29–40.
13. Abraham P., Avenell A., Watson W.A., Park C.M., Bevan J.S. A sy-syematic review of drug therapy for Graves' hyperthyroidism. Eur J En-docrinol. 2005; 153: 489–498.
14. El Fassi D., Nielsen C.H., Bonnema S.J., Hasselbalch H.C., Hege-dus L. B lymphocyte depletion with the monoclonal antibody rituximab in Graves' disease: A controlled pilot study. J Clin Endocrinol Metab.2007; 92: 1769–1772.
15. Franklyn J.A., Maisonneuve P., Sheppard M., Betteridge J., Boyle P.Cancer incidence and mortality after radioiodine treatment for hyperthy-roidism: a population-based cohort study. Lancet.1999; 353: 2111–2115.
16. Ron E., Doody M.M., Becker D.V. et al. Cancer mortality following treatment for adult hyperthyroidism. Cooperative Thyrotoxicosis Thera-py Follow-up Study Group. JAMA. 1998; 280: 347–355.
17. Tamagna E., Levine G.A., Hershman J.M. Thyroid hormone con-centrations after radioiodine therapy for hyperthyroidism. J Nucl Med.1979; 20: 387.