EUTHYROID GRAVES’ DISEASE

Thyroid Eye Disease with Normal Thyroid Function

Euthyroid Graves' disease is a condition characterized by the signs and symptoms of thyroid eye disease in the absence of thyroid dysfunction.

What is Euthyroid Graves’ Disease?

Euthyroid Graves' disease is an autoimmune condition that causes the characteristic eye symptoms of Graves' ophthalmopathy, which is more commonly known as thyroid eye disease (TED), in the absence of thyroid dysfunction. Most patients with euthyroid Graves' disease go on to develop thyroid disease within 12-18 months after eye symptoms develop. Most of these patients develop Graves' disease, an autoimmune thyroid disorder, although a smaller number of patients may develop autoimmune hypothyroidism.

About 15-20 percent of patients with euthyroid Graves' disease never develop thyroid dysfunction. However, even though patients with euthyroid Graves' disease are considered to have normal thyroid function based on blood tests for thyroid function, they can have transient symptoms of both hypothyroidism and hyperthyroidism.

Autoantibodies in Euthyroid Graves’ Disease

Patients with euthyroid Graves' disease typically have high levels of both stimulating and blocking TSH receptor antibodies (TRAb). While stimulating TRAb, which are also known as thyroid stimulating immunoglobulins or TSI, stimulate thyroid cells to produce excess thyroid hormone in Graves' disease, the blocking TRAb in euthyroid Graves' disease prevent TSI from causing hyperthyroidism. Each of these antibodies cancels out the effects of the other on thyroid function. However, because they are both capable of eliciting an immune response in eye muscle (orbital) tissue, they contribute to signs and symptoms of TED.

Signs and Symptoms

The most significant changes in TED involve congestion and infiltration of orbital muscle, causing the eyeball to appear swollen. The eye muscle in TED also has limited motion caused by this congestion, causing limited upward or downward gaze. Muscle restriction also contributes to double vision (diplopia). The muscle fibers in TED do not change but deposits of white blood cells and immune system chemicals lodge between the fibers causing orbital congestion. Typical symptoms in TED include eyelid retraction, puffiness (orbital edema), proptosis or exophthalmos (bulging forward of the eyeball), lid lag, photophobia (light sensitivity), conjunctival inflammation, double vision, redness, optic nerve compression, and keratitis.
Patients with euthyroid Graves' disease may also develop pretibial myxedema, a skin condition that is also caused by the combination of both blocking and stimulating TRAb. In pretibial myxedema, the skin of the lower legs and shins is most likely to be affected. Symptoms include puffy, mottled skins with waxy brown lesions. Occasionally, the skin of the upper arms and back may also be affected.

**Diagnosis**

Euthyroid Graves' disease is diagnosed in patients with symptoms of TED who have normal thyroid function tests (FT4, FT3 and TSH) with elevated levels of TRAb. Patients with euthyroid Graves' disease may also have high levels of thyroglobulin and/or TPO antibodies. Imaging tests, especially MRI or CT scans, may also be used to assess orbital congestion, and an exophthalmometer may be used to measure proptosis. An orbital ultrasound may also be used to measure enlargement of orbital muscles. Ultrasounds may be followed over time to assess disease progression and treatment response.

**Disease Course**

Euthyroid Graves' disease is a self-limited disorder. During the active disease phase, which can last from several months to 5 years or longer, symptoms typically wax and wane, sometimes worsening over time. The active phase is followed by a resolution phase. During the resolution phase, much changes associated with TED resolve spontaneously. However, if scar tissue forms or permanent changes occur, surgery known as orbital decompression may be required. This surgery should not be performed during the active disease phase since surgical changes can interfere with the normal healing process.

**Treatment**

Treatment for euthyroid Graves' disease involves therapies designed to reduce the immune response and promote immune system healing. Corticosteroids are the drug most commonly used although they are typically only used in cases where vision is threatened by orbital nerve compression. Improvement that occurs when corticosteroids are used is usually limited as symptoms are likely to return and sometimes appear worse when corticosteroids are stopped. Localized external beam radiotherapy may also be used in a series of treatments designed to reduce orbital congestion. Patients who show a favorable response to corticosteroids usually show a good response to orbital radiotherapy.

Nutrient-rich diets, stress reduction techniques, and an avoidance of environmental triggers including excess dietary iodine and stress, are also essential steps in the healing process.

**Resource:**
Elaine Moore, Thyroid Eye Disease, Understanding Graves’ Ophthalmopathy, SaraHealth Press, Canada: 2002.