Exophthalmos in Patients Presenting with Hyperthyroid Manifestations

Thesis
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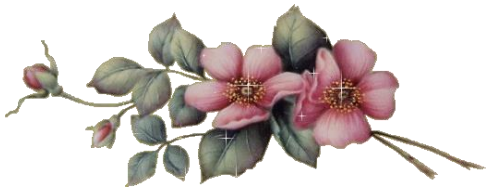

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List of Abbreviations

Abb.	Meaning
(131-I)	Iodine-131 therapy
(AATG)	The American Association for Thyroid Gland
(AMP)	Adenosine monophosphate
(CAS)	Clinical Activity Score
(CD4)	Cluster of differentiation 4 (glycoprotein)
(GAT)	Goldman applanation tonometry
(GD)	Graves' disease
(GO)	Graves' ophthalmopathy
(IGF-1)	Insulin-like growth factor-1
(IGF-1r)	Insulin-like growth factor 1 receptor
(IOP)	Intraocular pressure
(IOP)	Intra-ocular pressure
(NSAIDs)	Non-steroidal anti-inflammatory drugs
(p70 S6K)	P70 S6 kinase
(PTU)	Propylthiouracil
(RAI)	Radioactive iodine
(RAIU)	Radioactive iodine uptake
(SPECS)	Soft tissue involvement, proptosis, extraocular muscle involvement, corneal involvement, and sight impairment
(TA)	Thyroid Adenoma
(TAO)	Thyroid associated ophthalmopathy
(TBII)	Thyrotropin-binding inhibitor immunoglobulin

(Thy-1) ..... THYmocyte differentiation antigen 1

(TMNG) ..... Toxic multinodular goiter

(TNF)..... Tumor necrosis factor

(TRAbs) ..... Thyrotropin receptor antibodies

(TSH) ..... Thyroid stimulating hormone

(TSHr)..... Thyroid-stimulating hormone receptor

(TSI) ..... Thyroid-stimulating immunoglobulins

(VEP) ..... Visual evoked potential

(SD) ..... Standard deviation

(TED) ..... Thyroid eye disease

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INTRODUCTION

Hyperthyroidism is a condition involving excessive secretion of thyroid hormones. Graves' disease the most common subtype of hyperthyroidism, is an autoimmune disorder in which IgG antibodies bind to thyroid stimulating hormone (TSH) receptors in the thyroid gland and stimulate secretion of thyroid hormones. It is more common in females and may be associated with other immune disorders. [(1)]

The autoimmune process usually affects the orbital and periorbital tissue (Thyroid ophthalmopathy), the thyroid gland and rarely the pretibial skin digits (thyroid acropachy). [(2)]

Graves' ophthalmopathy also known as thyroid-associated ophthalmopathy, thyroid orbitopathy or thyroid eye disease, because it sometimes occurs in patients with euthyroid or hypothyroid chronic autoimmune thyroiditis. [(3)]

Graves' ophthalmopathy is diagnosed clinically by the presenting ocular signs and symptoms, but positive tests for antibodies (anti-thyroglobulin, anti-microsomal and anti-thyrotropin receptor) and abnormalities in thyroid hormone level (T3, T4, and TSH) help in supporting the diagnosis. [(3)]

Bilateral ocular symptoms and hyperthyroidism most often occur simultaneously or within 18 months of each other.

These symptoms may include dry and gritty ocular sensation, photophobia, excessive tearing, double vision and pressure sensation behind the eye.

The most common clinical features are proptosis, upper eyelid retraction, edema and erythema of the periorbital tissues and the conjunctiva. [4]

Graves' ophthalmopathy classified into 7 classes, **class zero** where no symptoms or signs. **Class one**; signs only limited to upper lid retraction and starring with or without lid lag. **Class two**; Soft tissue involvement (edema of conjunctiva and lids, conjunctival injection). **Class three**; Proptosis. **Class four**; extra ocular muscle involvement (usually with diplopia). **Class five**; Corneal involvement (primarily due to lagophthalmos). Class six; Sight loss (due to optic nerve involvement). [6][5]

Proptosis describes an abnormal protrusion of the globe, (also called exophthalmos, exophthalmia or exorbitism), it can either be bilateral (as often seen in Graves' disease) or unilateral (as in orbital tumors). In the case of Graves' disease, the displacement of the eye is due to abnormal connective tissue deposition in the orbit and extra ocular muscles which can be visualized by CT and MRI. [7]

AIM OF THE STUDY

Description of two groups of thyroid patients with exophthalmos with and without replacement therapy presenting to the Endocrine Outpatient Department at Ain Shams University Hospitals.

GRAVES' DISEASE

Definition Of Graves' Disease:

Graves' disease (GD) was named after the Irish physician Robert James Graves (1797–1853), who portrayed the disorder of hyperthyroidism, goiter, and exophthalmos. This immune system illness has a rate of 1/1000 ladies for each year and speaks to the most widely recognized type of hyperthyroidism. The overproduction of thyroid hormones by thyroid follicular cells in GD is interceded via autoantibodies coordinated against the thyroid- stimulating hormone receptor (TSHr). Graves' ophthalmopathy (GO; otherwise called thyroid-related ophthalmopathy or thyroid eye sickness) is clinically apparent in 25–50% of patients with GD. [8]

GD is an immune system issue in which thyrotropin receptor antibodies (TRAbs) empower the TSH receptor, expanding thyroid hormone generation. The characteristic history of nodular thyroid disease incorporates development of established nodules, new nodule formation, and advancement of self-sufficiency over time. [9]

GD is the most well-known reason for hyperthyroidism. Toxic nodular goiter is less common than GD, its prevalence increments with age and in the presence of iodine lack. In this

way, toxic nodular goiter might really be more common than GD in more established patients from locales of iodine insufficiency. [10]

While it may be foreseen that the seriousness of thyrotoxic symptoms is relative to the rise in the serum levels of free T4 and T3 gauges, in study in 2010 the Hyperthyroid Symptom Scale did not firmly correspond with free T4 or T3 estimates and was conversely connected with age. The significance of age as a determinant of the pervasiveness and seriousness of hyperthyroid symptoms has been confirmed recently. [11]

Goiter size, obstructive indications, and the seriousness of Graves' ophthalmopathy can be dissonant with the level of hyperthyroidism or hyperthyroid symptoms. All patients with known or suspected hyperthyroidism ought to experience a thorough history and physical examination, including estimation of heartbeat rate, blood pressure, respiratory rate, and body weight. Likewise, thyroid size; presence or absence of thyroid tenderness, symmetry, and nodularity; pulmonary, cardiovascular, and neuromuscular capacity and presence or absence of peripheral edema, eye signs, or pretibial myxedema ought to be evaluated. [12][13]

Biochemical Evaluation:

Serum TSH estimation has the most noteworthy affectability and specificity of any single blood test utilized as a part of the assessment of suspected hyperthyroidism and ought to be utilized as an introductory screening test. {14}

Nonetheless, when hyperthyroidism is emphatically suspected, analytic precision enhances when both a serum TSH and free T4 are surveyed at the season of the starting assessment. When the pituitary-thyroid axis is in place) is a reverse log-direct relationship; in this manner, little changes in free T4 result in vast changes in serum TSH concentrations. Serum TSH levels are significantly more sensitive than direct thyroid hormone estimations for surveying thyroid hormone excess. (15)