

A Case Series of Thyrotoxicosis in the Age Group of 11-20 Years

Dr G. Ravi Babu., M.S. ^{*}, Dr Alla Venkata Pitchi Reddy., M.S. ^{**}, Dr P. Padma
Latha., M.D., D.M. ^{***}, Dr Boddepalli Anusha. ^{****}

^{*} Professor of Ophthalmology, Guntur Medical College, Guntur.

^{**} Assistant Professor of Ophthalmology, Guntur Medical College, Guntur.

^{***} Associate Professor of Medicine, Guntur Medical College, Guntur.

^{****} Post Graduate of Ophthalmology, Guntur Medical College, Guntur.

Abstract: We present a case series of thyrotoxicosis carried out on 7 patients who were observed, investigated and treated for a period of 1 yr ie., from october 2014 to october 2015 who presented to Out patient department of Government General Hospital, Guntur. The study was carried out on the age group of 11 to 20 years age group patients while the most common age of presentation being 25-50 years. We consider this study to focus on rare presentation with regard to age ie., youger than the usual group. We have considered age of presentation, clinical signs and symptoms at presentation, response to the treatment and the final outcome of the patients in the 1 year period considered.

Key Words: Thyrotoxicosis, Graves disease, T3, T4, TSH, Anti TSH Ab, Acute Progressive Optic Neuropathy.

I. Introduction:

Hyperthyroidism, also known as over active thyroid and hyperthyreosis, is the condition that occurs due to excessive production of thyroid hormone by the thyroid gland.^[1] It occurs between two and ten times more often in women.^[2] Onset is commonly between 20 and 50 years of age.^[3] Overall the disease is more common in those over the age of 60 years. Thyroid hormone is critical to normal function of cells. In excess, it both overstimulates metabolism and exacerbates the effect of the sympathetic nervous system, causing "speeding up" of various body systems and symptoms resembling an overdose of epinephrine (adrenaline)^[4].

Signs and symptoms are due to adrenaline and vary between people and includes irritability, muscle weakness, sleeping related problems, palpitations, heat intolerance, diarrhea, enlargement of the thyroid, menstrual irregularities and weight loss. Symptoms are typically less in the old and during pregnancy. Graves disease is the cause of about 50% to 80% of case of hyperthyroidism world wide^[5]. Other causes include multinodular goiter, toxic adenoma, inflammation of the thyroid, eating too much iodine, and too much synthetic thyroid hormone, Hashimoto thyroiditis. A less common cause is a pituitary adenoma. The diagnosis may be suspected based on signs and symptoms and then confirmed with blood tests. Typically blood tests show a low thyroid stimulating hormone (TSH) and raised T₃ or T₄. Treatment depends partly on the cause and severity of disease. There are three main treatment options: radioiodine therapy, medications, and thyroid surgery. Radioiodine therapy involves taking iodine-131 by mouth which is then concentrated in and destroys the thyroid over weeks to months^[5]. The resulting hypothyroidism is treated with synthetic thyroid hormone. Medications such as beta blockers may control the symptoms and anti-thyroid medications such as methimazole are helpful. Surgery to remove the thyroid is another option.

II. Materials And Methods:

This is a Prospective Interventional Study carried out with meticulous history taking, proper examination including general physical examination and ocular examination with the the suspicion of Thyrotoxicosis in the back of mind. Ocular examination is done with Slit lamp examination, exophthalmometry for proptosis, fundus examination with direct and indirect ophthalmoscopy. Complete Thyroid profile [T3, T4, TSH], Anti TSH Ab, Anti TPO Ab.

Inclusion Criteria: 1. Age group of 11-20 yrs

2. Patients who present to Ophthalmology OPD directly or through a referral are included.

Exclusion Criteria: 1. Age < 11 years and > 20 years

2. Patients who donot visit to ophthalmology opd are not included in the study

3. Patients with any other coexisting cause of proptosis

4. Patients with any associated endocrinological disorders are excluded from the study.

III. Discussion:

Hyperthyroidism, also known as over active thyroid and hyperthyreosis, is the condition that occurs due to excessive production of thyroid hormone by the thyroid gland.^[1] It occurs between two and ten times

more often in women.^[2] Most common cause of hyperthyroidism is Graves disease. It 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 which leads to eye manifestations

Inflammation of extraocular muscles is characterized by pleomorphic cellular infiltration associated with increased secretion of glycosaminoglycans and osmotic imbibition of water. The muscles become enlarged. Inflammatory cellular infiltration with lymphocytes, plasma cells, macrophages and mast cells of interstitial tissues, orbital fat and lacrimal glands with accumulation of glycosaminoglycans and retention of fluid. This causes an increase in the volume of orbital contents and secondary elevation of intraorbital pressure leading to proptosis and some times the patient land in Acute compressive optic neuropathy which is sight threatening. In this, if the involved tissues (mainly muscle) begin to compress the optic nerve and if the nerve is further stretched due to proptosis, visual loss can occur. Features of possible optic neuropathy require urgent referral to an ophthalmologist because the shorter the duration of visual loss, the better the chance of a good outcome of treatment.

These feature include:

- Blurred vision.
 - Impaired perception of colour.
 - Reduced visual acuity.
 - A relative afferent papillary defect.
 - Visual field defect
-
- Graves disease is the cause of about 50% to 80% of case of hyperthyroidism world wide. Other causes include multinodular goiter, toxic adenoma, inflammation of the thyroid, eating too much iodine, and too much synthetic thyroid hormone, Hashimoto thyroiditis.⁷
 - A less common cause is a pituitary adenoma.
 - Typically blood tests show a low thyroid stimulating hormone (TSH) and raised T₃ or T₄. Three main treatment options: radioiodine therapy , medications, and thyroid surgery
 - Medications such as beta blockers may control the symptoms and anti-thyroid medications such as methimazole are helpful.⁸
 - Ocular signs are eyelid retraction (stare) Dalrymple sign, extra-ocular muscle weakness, and lid-lag (von Graefe's sign) . These signs disappear with treatment of the hyperthyroidism.⁹

IV. Conclusion:

Out of 7 patients, 5 of 7 presented with exophthalmos, tremors and anxiety. 3 of 5 who had exophthalmos had a mild degree of proptosis and rest 2 patients had moderate proptosis. 6 of 7 had eye signs, 7 of 7 patients had normal anterior segment except for proptosis. 7 of 7 patients had altered thyroid profile which was consistent for hyperthyroidism. 1 of 7 patient had acute compressive optic neuropathy who presented with transient loss of vision prompt diagnosis and starting of anti thyroid medications and betablocker saved her vision.

To conclude on a final note though thyroid eye disease is common middle aged women, a keen observation should also be paid on the younger age group too when they present with mild proptosis with anxiety and tremors as these clinical signs and symptoms are easily missed. When they are picked up promptly and treated we can save the sight threatening complications either due to involvement of cornea (due to exposure leading to exposure keratopathy, damaging the cornea) and optic neve (due to compression by enlarged bellys of muscles and stretch of optic nerve due to proptosis).



Figure 1: 11 year girl child with eyes in primary position, with right eye showing scleral show and stare; Dalrymple sign



Figure 2 : Same patient with Right eye showing lid lag in down gaze ,VonGraefe's sign

References:

- [1]. Bahn Chair, RS; Burch, HB; Cooper, DS; Garber, JR; Greenlee, MC; Klein, I; Laurberg, P; McDougall, IR; Montori, VM; Rivkees, SA; Ross, DS; Sosa, JA; Stan, MN (June 2011). "Hyperthyroidism and other causes of thyrotoxicosis: management guidelines of the American Thyroid Association and American Association of Clinical Endocrinologists.". *Thyroid : official journal of the American Thyroid Association* 21 (6): 593–646
- [2]. "Hyperthyroidism". www.niddk.nih.gov. July 2012. Retrieved 2015-04-02.
- [3]. "Depression and Psychosis in Neurological Practice.". *Bradley's neurology in clinical practice*. (6th ed.). Philadelphia, PA: Elsevier/Saunders. 2012. pp. 102–103.
- [4]. Faculty of Medicine & Dentistry (2006). "Course-Based Physical Examination - Endocrinology -- Endocrinology Objectives (Thyroid Exam)". Undergraduate Medical Education. University of Alberta. Retrieved 28 January 2007
- [5]. *Harrison's principles of internal medicine- 19th edition*, volume 2, chapter 405, page no 2293-2298
- [6]. "Clinical features of Graves' ophthalmopathy in an incidence cohort". *American journal of ophthalmology* 121 (3): 284–90.
- [7]. Behbehani R; Clinical approach to optic neuropathies. *Clin Ophthalmol*. 2007 Sep;1(3):233-46.
- [8]. Tucker S et al; Thyroid Orbitopathy, Chapter 36, *Duane's Ophthalmology*, 2006.
- [9]. Chong K, Thyroid Eye Disease: a Comprehensive Review, *Medical Bulletin, The Federation of Medical Societies of Hong Kong*, Vol 15, No 10. 2010.