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Clinical Profile of Patients with Thyroid Related Orbitopathy

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Abstract

Introduction: An association between various systemic conditions like diabetes mellitus, hypertension and glaucoma have been demonstrated. Likewise an association between thyroid orbitopathy and glaucoma have been described in various literatures. *Methodology:* Thyroid related orbitopathy was diagnosed on the basis of clinical history of thyroid dysfunction, eye symptoms and signs. Laboratory investigations – serum T3, T4 and TSH, which confirmed the thyroid status to be hyper, hypo or euthyroid and all patients, underwent ultra-sonography and few computed tomography as required. *Results:* In our study minimum age was 18 years and the maximum was 69 years. The mean age was 46.17±10.06. One patient had family history of glaucoma and had normal intra ocular pressure, disc and fields.Family history of thyroid dysfunction was present in 7 patients (11.67%) and 8 patients (13.33%) were on medication for thyroid dysfunction. *Conclusion:* The labelling of thyroid related orbitopathy patients as ocular hypertensives should hence be made with care and these patients need careful follow up.

Keywords: Thyroid Related Orbitopathy; Glaucoma; Ophthalmopathy.

Introduction

Thyroid orbitopathy was first described by Caleb Hillier Parry in 1786. Since then there has been a myriad descriptions of its complex manifestations and clinical course. Its multisystem involvement has seeked interest of doctors from all the fields. Since its initial descriptions many nomenclature, classification, diagnostic criteria have been proposed.The term thyroid orbitopathy is used rather than thyroid ophthalmopathy as the orbital tissue is mainly affected.

McKenzie in 1968 defined Graves disease as a syndrome characterised by one or more of following features [1-3].

1. Diffuse hyperplasia of thyroid(with or without nodularity)
2. Ophthalmopathy
3. Infiltrative dermopathy(pre-tibialmyxoedema)

An association between various systemic conditions like diabetes mellitus, hypertension and glaucoma have been demonstrated. Likewise an association between thyroid orbitopathy and glaucoma have been described in various literatures.

Wessley first described raised intra ocular pressure in thyroid orbitopathy patients in 1918. Since then various studies have been done to prove the same [4].

The association of exophthalmos in Goitre cases dates back to as early as 12th century as described by Persian manuscripts of Sayrid Ismail Al-Juryani. In 1786 parry described Goitre, tachycardia and exophthalmos as Parry's disease. In 1835, Graves described an association of thyroid gland enlargement with palpitation and exophthalmos.

Karl A von Basedow (1799-1854) also described orbitopathy in Graves disease. He coined the

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synonym of 'merseburg triad' for the association of Goitre, orbitopathy and dermatological changes.

In 1984, Waller and Jacobsen proposed a diagnostic 'pie diagram'. They considered lid retraction as the primary criteria and the pie was divided into 4 quadrants each representing a secondary criteria viz EOM involvement, optic neuropathy, proptosis and thyroid dysfunction. When both primary & secondary criteria are present together, the diagnosis of thyroid orbitopathy was confirmed [5].

The multiplicity of diagnostic criteria and nomenclature is due to the ignorance of etiology .the autoimmune etiology concept which has been proved now has simplified the term Graves disease. There are many aspects of this fascinating condition which are yet to be discovered.

Methodology

Thyroid related orbitopathy was diagnosed on the basis of clinical history of thyroid dysfunction, eye symptoms and signs. Laboratory investigations – serum T3, T4 and TSH, which confirmed the thyroid status to be hyper, hypo or euthyroid and all patients underwent ultra-sonography and few computed tomography as required.

Inclusion Criteria

1. All patients clinically diagnosed to have thyroid related orbitopathy.
2. Patients with open angles on gonioscopy.

Exclusion Criteria

In patients with thyroid related orbitopathy:

1. Patients on systemic or topical steroids – systemic B-blockers.
2. Patients with corneal pathology, where intra ocular pressure cannot be measured.
3. Un co-operative patients
4. Other intraocular pathology (which my influence intra ocular pressure) PXF, trauma, retinal detachment, severe diabetic retinopathy.
5. patients with closed angles on gonioscopy.

The patients were examined elaborately in a proforma, which encompassed basic demographic data such as name, age, sex. Detailed systemic and ocularhistory, which reviewed the duration of thyroid related orbitopathy, symptoms and signs, as well as systemic symptoms of thyroid dysfunction. Family history of glaucoma and thyroid disease.

History of prior treatment with anti-glaucoma medication and treatment of thyroid dysfunction. History of diabetes and treatment of the same. Since these would influence the intra ocular pressure and occurrence of glaucoma.

Results

There is significant increase in IOP when gaze is shifted from primary to up gaze.

Table 1: Difference in IOP from primary to upgaze

0 – 4	65%
4 – 6	23.33%
>6	11.66%

Table 2: Difference of IOP from down to primary gaze

0 – 4	91.67%
4 – 6	3.33%
>6	5%

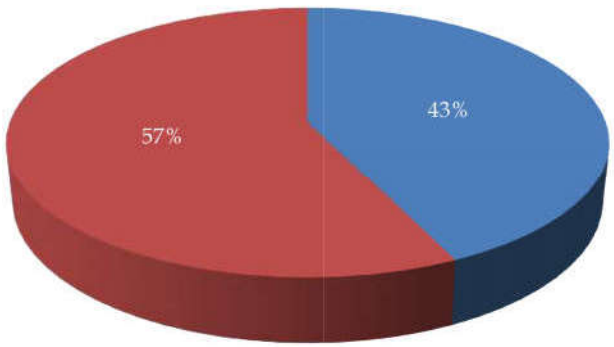

Fig. 1: Gender didtribution

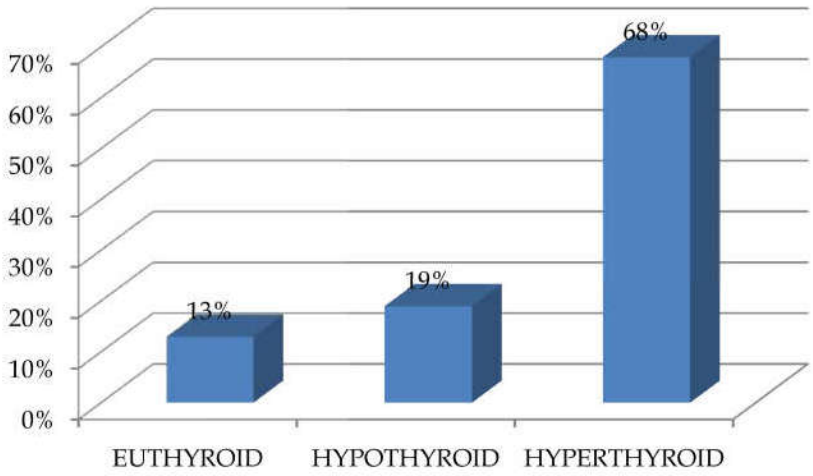

Fig. 2: Thyroid status

Table 3: Paired Sample Statistics

		Mean	N	Std. Deviation	Std. Error mean
Pair 1	Upgaze	21.53	60	3.48	0.449
	Primary gaze	17.37	60	2.64	0.341
Pair 2	Primary gaze	17.37	60	2.64	0.341
	Down gaze	16.40	60	3.01	0.388
Pair 3	Up gaze	21.53	60	3.48	0.449
	Down gaze	16.40	60	3.01	0.388

Table 4: Paired Sample Test

		Paired differences			P– Value
		Mean	95% confidence interval of the difference lower	upper	
Pair 1	Up gaze – primary gaze	4.57	3.04	5.27	<0.0001
Pair 2	Down gaze – primary gaze	2.23	-0.05	1.99	0.06
Pair 3	Down gaze – up gaze	5.2	3.95	6.3	<0.0001

Discussion

Age: In our study minimum age was 18 years and the maximum was 69 years. The mean age was 46.17 ±10.06

Sex: Our study had female preponderance. Female patients were 56.67% and male were 43.33%. this correlates with the study done by Khurana AK [6]. which showed ratio of female to male of 1.5:1.

Thyroid Status: Our study had predominance of hyperthyroidism (70%) and an almost equal representation of both hypothyroidism and euthyroidism 16.66% and 13.34% respectively. This correlates with study done by Khurana AK which showed the thyroid status as 63.3% of patients with hyperthyroidand 36.7% euthyroid. None of the patients had hypothyroidism [6].

The ocular symptoms and signs based on the history ranged from 2 months to 10 years, with mean duration of 18 months.

- One patient had family history of glaucoma and had normal intra ocular pressure, disc and fields.
- Family history of thyroid dysfunction was present in 7 patients(11.67%) and 8 patients (13.33%) were on medication for thyroid dysfunction.
- Two patients were non-insulin dependent diabetes mellitus diabetics on oral hypoglycaemic.

Best corrected visual acuity

81.67% of patients, had the best corrected visual acuity of 6/6. The remainder had visual acuity ranging between 6/6 and 1/60 due to lens changes and optic neuropathy.

Colour Vision

The colour vision was normal in most of the patients. Two patients could not be tested due to very poor vision.

Afferent Papillary Reaction

2 patients had relative afferent papillary defect by Levatin's swinging flash light test.

Central Fields

46 patients had normal fields. 2 eyes one in each patient fields could not be tested due to very poor vision, fields in other eye was normal. Two patients had glaucomatous field defect.

Proptosis

Total of 48 eyes(80%) were found to have proptosis. 19 patients had bilateral proptosis, 10 patients had unilateral proptosis and 12 eyes(20%) had no proptosis. Which correlates with study by Khurana AK, which concludes that exophthalmometric readings were significantly high in GO(Graves' orbitopathy) patients as compared to controls [6].

The *Hertel'sexophthalmometry* reading varied between 18mm and 30mm, with a mean of 22.15±2.54.It showed asymmetry in involvement of eyes.

Fundus

In 86.67% (46 eyes) optic nerve head and nerve fibre layer were found to be normal. 2eyes in 2 patients had disc pallor. 2 eyes had glaucomatous disc damage.

Extra-ocular motility

a. *Elevation:* One patient had very gross restriction of elevation corresponding to (-4) of grading. 4 patients had severe restriction (-3), 4 patients had moderate restriction (-2) and 6 patients had mild restriction (-1). 56.67% had restriction of elevation and were graded as abnormal.

b. *Depression:* Depression was restricted in only 13.33% of our patients.

c. *Adduction:* Adduction was minimally restricted (-1) in 10% of patients.

d. *Abduction*: Abduction was severely restricted (-4) in 2 patients, moderately restricted in (-2,-3) in 2 patients and very minimal restriction (-1) in 9 patients.

Elevation and abduction were the movement most restricted, showing that the inferior rectus and medial rectus are most affected. The findings were confirmed by ultrasonography.

Ultrasonography

Imaging revealed thickening of bellies and sparing of tendons of the extraocular muscle in 16 eyes (26.67%) by ultrasonography. 44 eyes were normal by ultrasonography . which correlates with the study by Khurana AK which states as, marked thickening of extra ocular muscles was noted, maximum for medial rectus, followed by inferior rectus in early as well as late cases with GO (Graves' orbitopathy) [6].

Conclusion

Only 8.33% of our patients had ocular hypertension in primary gaze, which corresponds with that existing in general population. The number of hypertensives increased to 53.33% on up gaze.

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