

Thyroid associated ophthalmopathy and glaucoma

Prakash Chand Agarwal

Associate Professor, Dept. of Ophthalmology, People College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh

Email: drprakash.eyecare@gmail.com

Abstract

Aim: To study the prevalence of glaucoma in patients with thyroid associated ophthalmopathy (TAO).

Methods: In a cross sectional study, 76 patients with thyroid associated ophthalmopathy (TAO) were included in the study. All patients with TAO presenting to our hospital (eye department & Endocrinology OPD) were included. All patients underwent complete ophthalmic examination including BCVA, Slit lamp examination, Fundus examination by +78 D lens, intraocular pressure measurement by Goldman Applanation Tonometer (GAT), visual fields (SITA standard 30-2, Humphrey, USA and pachymetry (Sonomed, USA). Exophthalmometry was done using Luedde's Exophthalmometer.

Results: A total of 76 consecutive patients of TAO were included in the study. There were 39 males and 37 females in our study. The mean age of the patients was 38.3 years (range: 23-57.5 years). All patients had some degree of proptosis along with congestive features of active TAO.

In our study 48 out of 152 eyes had IOP > 21 mm Hg. 16 eyes had optic nerve changes and visual field changes to be labeled as glaucomatous. 32 eyes had only high IOP without corresponding optic nerve or visual field changes.

Conclusions: Patients with thyroid associated ophthalmology (TAO) have high prevalence of ocular hypertension and secondary glaucoma.

Keywords: Glaucoma, Graves disease, Thyroid associated ophthalmopathy

Introduction

Thyroid associated ophthalmopathy (TAO) is common disease in patients with thyroid dysfunction. Prevalence of glaucoma is higher in patients with TAO as compared to normal population.⁽¹⁻⁵⁾

Patients of TAO have higher incidence of glaucoma due to ocular congestion, increased venous pressures and globe compression by the extraocular muscles contraction against adhesions. Few studies have been done to report the prevalence of glaucoma in patients with TAO.⁽¹⁻⁵⁾

Often glaucoma is missed in such patients as the focus of care is the acute proptosis, acute onset diplopia, pain and corneal exposure. Measurements may vary with alignment and position of globe. Patients are uncooperative for contact procedures due to pain and lid swellings. With above facts, we conducted a study of patients with thyroid dysfunction and ocular involvement.

Material and Methods

In a cross sectional study, patients with thyroid associated ophthalmopathy (TAO) were included in the study. All patients with TAO presenting to our hospital (eye department & Endocrinology OPD) were included. The diagnosis of TAO was based on clinical symptoms, signs, proptosis, eyelid retraction, ocular inflammation, the presence of goiter, elevated levels of serum T3 and T4, and other supporting features. All patients underwent complete ophthalmic examination including BCVA, Slit lamp examination, Fundus examination by +78 D lens, intraocular pressure measurement by Goldman Applanation Tonometer (GAT), visual fields (SITA standard 30-2, Humphrey, USA and pachymetry

(Sonomed, USA). Exophthalmometry was done using Luedde's Exophthalmometer. The data thus obtained was tabulated and analysed using SPSS software.

Glaucoma was defined as IOP greater than 21 with glaucomatous changes of optic nerve and/or glaucomatous visual fields defects. Normal Tension glaucoma was defined as IOP greater than 21 mm Hg without optic nerve changes and normal visual fields. Proptosis was defined as measurement of Luedde's exophthalmometer > 20mm from lateral orbital rim.

A non contrast Computed tomography of orbits was done for evaluation of proptosis, extraocular muscle enlargement and globe compression whenever indicated. MRI orbit was done in few cases where optic nerve compression was suspected.

Results

A total of 76 consecutive patients of TAO were included in the study. There were 39 males and 37 females in our study. The mean age of the patients was 38.3 years (range: 23-57.5 years). All patients had some congestive features of active TAO and varying degree of proptosis.

Glaucoma was defined as IOP greater than 21 with glaucomatous changes of optic nerve and/or glaucomatous visual fields defects. Normal Tension glaucoma was defined as IOP greater than 21 mm Hg without optic nerve changes and normal visual fields.

In our study 48 out of 152 (31.5%) eyes had IOP > 21 mm Hg. 16 eyes (10.5%) had optic nerve changes and visual field changes to be labeled as glaucomatous. 32 (21%) eyes had only high IOP without corresponding optic nerve or visual field changes.

Discussion

The association of glaucoma with thyroid eye disease was described by Wessely, in 1918. The classical description of high IOP was noted in upgaze due to non-relaxation of Inferior rectus muscle in upgaze leading to compression of globe and thus elevated IOP. Since then several other studies described the phenomenon of increased IOP on upgaze in patients with Graves' orbitopathy.⁽⁶⁻⁸⁾ All studies agree on the mechanism of the increased IOP on upgaze.

Our study is the first study in central India related to this issue. Very few studies have been done in India in this context. In our study there was no significant difference in number of males and females. Also mean age in the two gender groups were similar (no significant difference). In our study proptosis was present in 42.7% of eyes (65 of 152 eyes) with TAO.

Bartley GB et al reported incidence of ophthalmopathy as 20% (18-22%) among hyperthyroidism patients over 6 months in an institute based study of 108 patients.⁽⁹⁾ Tanda ML in a large series of 346 patients with Graves disease seen at a single center, reported that approximately 24% patients had features of TAO.⁽¹⁰⁾ Laurberg P reported that approximately 5% of the patients with Graves' disease develop moderate to severe GO in 2012. Cases with mild changes were not included in the study.⁽¹¹⁾ Woo KI reported presence of thyroid eye disease in 283 (17.34%) of the 1,632 patients examined in a study in 2013. They reported no gender based difference in thyroid eye disease.⁽¹²⁾

Behrouzi Z et al in cross sectional study of 233 eyes with TAO reported prevalence of open angle glaucoma (OAG) and ocular hypertension (OHT) was 2.5% and 8.5%. The prevalence of OHT was higher in cases with Graves Ophthalmopathy than age and sex-matched controls.⁽¹³⁾ Ohtsuka K in their study of 95 patients with Graves Ophthalmopathy reported that IOP > 21 mm Hg was noted in 42 of the 190 eyes (22%). IOP was statistically higher among eyes with proptosis > 19 mm versus proptosis < 19 mm.⁽⁵⁾ Cockerham KP in a retrospective study analysed data of 500 patients with TAO and reported that 24% patients had intraocular pressure (IOP) > 22 mmHg (but less than 30 mmHg).²

In our study concerning 16 eyes had glaucoma with visual field changes and optic nerve changes out of 152 eyes. The visual field changes were early in all except 2 eyes where bi-arcuate scotoma was noted. The early visual field defects were generalized depression in 6 eyes, centrocaecal scotoma in 2 eyes, early arcuate scotoma in 4 eyes and superior arcuate scotoma in 2 eyes. 4 patients with arcuate defects had corresponding changes in optic disc thus confirming glaucomatous change. Thus in our study ocular changes such as proptosis, ocular hypertension and glaucomatous visual fields were similar to other studies done world wide.

Limitations of our study are small sample size and cross sectional nature. Nonetheless our study proves

that the prevalence of glaucoma is much higher among patients with Thyroid associated ophthalmopathy. Thus all patients with TAO must undergo IOP measurement and may be treated as required.

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