

Descriptive Prospective Epidemiological Study In Thyroid Eye Disease In Tertiary Eye Care Hospital

Dr. Mayur Damor*, Dr. Richa K Dangi**, Dr. Kumari Ankita Dharmesh***, Dr Dhruvi Jain***, Dr. Pankaj Taviyad****

*Assistant Professor, In Ophthalmology In Baroda Medical College And Hospital, **Tutor In Government Dental College And Hospital, ***1st Year Resident In Baroda Medical College,****Associate Professor, Department Of Microbiology, Bhavnagar Medical College.

Abstract: Background: Thyroid eye disease can have a social and psychological well being, epidemiological evidence of thyroid eye disease is lacking in Gujarat. Material And Methods: The epidemiological prospective epidemiological study in 32 thyroid patients in Tertiary care hospital from year 2011 to 2013.

Result: In our study female are more affected with diplopia and inferior rectus muscle restriction

Conclusion: The prevalence of Thyroid eye disease now a say increasing in state of Gujarat so the robust result of this study add valuable evidence on Thyroid eye disease in City. [Damor M Natl J Integr Res Med, 2024; 15(1): 23-27, Published on Dated: 26/01/2024]

Key Words: thyroid eye disease, prevalence, epidemiology, treatment

Author for correspondence: Dr Mayur Damor, Assistant Professor, In Ophthalmology In Baroda Medical College And Hospital E-Mail: doctor.mayur@gmail.com Mobile: 9727713087

Introduction: Our thyroid gland is a butterfly-shaped gland that is located in the lower front of your neck. The job of your thyroid gland is to make thyroid hormones. Thyroid hormones are released into your blood and carried to every tissue in your body. Thyroid hormones help your body use energy, stay warm and keep your brain, heart, muscles, and other organs working normally¹.

Thyroid eye disease (abbreviated as TED) is an autoimmune disease that affects some people with autoimmune thyroid disease. TED is most common in people with hyperthyroidism due to Graves' disease and rarely, may occur in patients with normal or low thyroid levels. About one in every three people with Graves' disease develops eye symptoms.

While eye symptoms can occur at any time, they usually appear within the first year of diagnosis of Graves' disease. TED is usually mild and gets better on its own over time. Some cases can be quite severe and can require medications or surgery. The diagnosis of thyroid eye disease (TED) can be made by your primary care physician, your thyroid doctor/ endocrinologist, or your eye doctor (ophthalmologist).

This usually occurs when you tell them about your symptoms, and they examine your eyes. You may also need additional testing such as measurement of the amount of bulging of your eye, tests to check your visual field, and color vision, a computed tomography (CT) scan or magnetic resonance imaging (MRI) scan of your

eye sockets and eye muscles. More research on TED is needed to better understand why some people get it and others do not. However, research has identified some factors that can make it more likely for TED to develop or get worse^{7,8}. If you have TED, there is good treatment available. There are some non-medication treatments you can use yourself, other treatments should be recommended or prescribed by your doctor, and sometimes surgery is needed.

Non-medication treatments you can use wear sunglasses if your eyes are more sensitive to sunlight, Wearing sunglasses helps protect your eyes from both sun and wind. Sunglasses with a wraparound design offer the best protection. Use lubricating eye drops.

Eye drops, such as artificial tears, may help relieve dryness and scratchiness. Be sure to use eye drops that are for lubrication. Check with your doctor if you aren't sure what type of eye drops to use. A lubricating gel can be used before bed if your eyelids do not close completely. This will prevent your cornea (the outer layer of your eye) from drying out while you are sleeping.

Raise the head of your bed. Keeping your head higher than the rest of your body may relieve pressure on your eyes. This can help reduce swelling and puffiness. Prisms. If double vision is a problem, glasses containing prisms may be prescribed by your eye doctor. Surgery is required in only a small number of patients with TED^{3,4}. Usually, surgery is planned when your eye

symptoms have reached the inactive phase. Inactive means that your eye symptoms are stable. They are not getting worse or better. Very rarely, emergency surgery is needed if you have any vision loss. You may need more than one type of eye surgery. If so, your ophthalmologist will let you know the best timing and order for the different procedures.

Orbital Decompression Surgery: If your eyesight is in danger and/or you have significant eye bulging, a type of surgery called orbital decompression can be done. There is a risk of complications. This can include double vision. However, emergency orbital decompression can be done if compression of the optic nerve is reducing your vision and you have not responded to medical therapy such as steroids.

Eye Muscle (Strabismus) Surgery: Sometimes scar tissue and other changes in your eyes can cause one or more eye muscles to be too short or too tight. This pulls your eyes out of alignment, leading to double vision. Eye muscle surgery may help correct double vision. The affected muscle is detached from your eyeball and reattached so that your eyes move together. In some cases, you may need more than one operation to improve double vision.

Eyelid Surgery: Eyelids can be retracted, leaving your eyes more widely open. This can cause you to have difficulty closing your eyelids. This leaves your eyeballs more exposed, causing excessive tear production and irritation. Surgical repositioning of your eyelid may help reduce the irritation.

Aims And Objectives: To find out the prevalence of myopathy in thyroid eye disease. To assess the anatomical and functional parameter for the thyroid eye disease.

Material & Methods: It is a Prospective descriptive clinical study of patients came to tertiary Eye care hospital having thyroid eye disease from may 2011 to December 2013. Ethical committee approval was taken from Medical college and Hospital. Written consent was taken from all the patients who were included in study. All the patients with thyroid eye disease was diagnosed on the basis of the Diagnostic criteria of Bartley et al²⁸ were included in study and Extra thyroid causes of similar ocular manifestation excluded. Basic details of the

patient and detailed history, general examination was carried out. In examination of eye we examine following parameters amount of proptosis by hurtel’s exophthalmometer, Upper lid retraction, Lid lag/ lagophthalmos, anterior segment examination, pupillary reaction, cover test, ocular movements, force duction test, visual acuity, colour vision, IOP measurement by applanation tonometry in primary gaze and upgaze., diplopia charting, posterior segment examination. Information on the patient’s medical status included to determination of thyroid status (hyperthyroidism, primary hypothyroidism, Hashimoto’s thyroiditis or euthyroid) the presence of systemic disorders, laboratory tests results related to thyroid function at the times of initial diagnosis of thyroid dysfunction and ophthalmopathy and at subsequent examination were recorded.

Results: A total 64 eyes of 32 patients 32 patients were examined on the basis of above mentioned criteria.

Table 1: Shows Age Wise Distribution Of Patients

Age Of Patients	Number Of Patients	Percentage
35-40	7	21.85
41-45	2	6.25
46-50	4	12.5
51-55	8	25
56-60	8	25
61-65	2	6.25
66-70	1	3.15
Total	32	100

Mean age in our study was 51.50 years with minimum age 35 years and maximum age was 70 years.

Table 2: Sex Wise Distribution Of Patients

Sex	Number of Patients	Percentage
Male	12	37.5
Female	20	62.5
Total	32	100

Table 3: Status Of Thyroid Disease

Status	Number of Patients	Percentage
Hyperthyroid	21	65.625
Hypothyroid	8	25
Euthyroid	3	9.375
Total	32	100

According to recent thyroid function tests around 65% patients were hyperthyroid 25% were hypothyroid and around 10% patients were euthyroid.

Table 4: Correlation Of Diplopia With Thyroid Status

Status Of Thyroid	Diplopia	Percentage	Total
Hyperthyroid	20	91	21
Hypothyroid	2	25	8
Euthyroid	0	0	3
Total	22		32

In hyperthyroid group,91% patients were having diplopia while it was 25% in hypothyroid group and in euthyroid group none of the patients shows diplopia.

Table 5: Restriction Of Ocular Movements

Status Of Thyroid	Restriction Of Movement Present	Total No Of Patients	Percentage
Hyperthyroid	20	21	95
Hypothyroid	1	8	12.5
Euthyroid	0	3	0
Total	21	32	66

Table 5 showing correlation between myopathy of ocular muscles in the form of restricted eye movements and thyroid status. In hyperthyroid patients almost 95% ,in hypothyroid patients about 12.5% and in euthyroid group none of the patients shows ocular myopathy.

Table 6: Amount Of Proptosis

Amount	No Of Eyes	Percentage
<16	3	4.75
17-20	22	34.375
21-24	34	53.125
25-28	4	7
>28	1	0.75
Total	64	

Amount of proptosis depends upon the severity of thyroid eye disease¹. Patient shown proptosis of about more than 28 on hurtel's exophthalmometer while about 54% of patients shown axial proptosis between 21-24 on the same instrument.

Table 7: Amount Of Proptosis In Eyes With Restricted Ocular Movements And Abnormal Colour Vision

Amount	Number Of Eye	Percentage	Abnormal Colour Vision	Percentage
<16	2	5	0	-
17-20	7	17	0	-
21-24	27	66	3	11
25-28	4	10	3	75
>28	1	2	1	100
Total	41		7	

7 eyes shown abnormal colour vision in the study and all of them having proptosis of more than 20 on hurtel's exophthalmometer and all of them from hyperthyroid group.

Table 8: Frequency Of Muscle Involved

Muscle	Number Of Eye	Percentage
SR	24	31
IR	37	48

MR	12	15
LR	5	6
Total	78	

Multiple muscles were involved in myopathy of ocular muscles in thyroid eye disease. In our study, most frequently involved muscle was

inferior rectus with 48% followed by superior rectus, medial rectus and lateral rectus with 31%, 15 % and 6 % respectively.

Table 9: Correlation With Intra Ocular Pressure In Upgaze

	Number Of Eye	Normal IOP In Upgaze	Increased IOP In Upgaze	Percentage
Myopathy Present	41	24	17	42
Myopathy Absent	23	23	0	0
Total	64	47	17	

Intra ocular pressure normal in upgaze means difference in intra ocular pressure between primary gaze and upgaze is less than 4 mm of hg. While more than 4 mm of hg is considered as IOP increased in upgaze.

This data is statistically significant with chi square value of 10.97 at p value=0.0009 which is highly significant. Upper lid retraction was present in 28% of eyes with thyroid eye disease. Positive forced duction test was found in all eyes with myopathy of ocular muscles.

Discussion: Observations of comments regarding the clinical characteristics of GO have approached in many published studies, but only few of them are population based. The focus of present study was to determine the clinical features of patients with GO in a prospective study.

Two age peaks of incidence are observed in the fifth and seventh decades of life, with slight differences between women and men. In our study the peak incidence was seen in 5th decade⁹. The disease is more common in females as compared to males with ratio of 7:1 while in our study female are 63 percentage and 36 percentage male¹⁰.

We can explain this disparity as follows; first, our clinic is a tertiary eye care center so that only the progressive or intractable cases are referred to this center. This disparity can be a selection bias in our study. Third, this finding in addition to difference in age peaks may show the presumed different demographic distribution of the disease in India.

The prominence of eyelid retraction as a characteristic feature of GO has been known in

many studies, and upper lid retraction has been common clinical finding, being detected in 83%-90% of the patients. Although the eyelid

malposition may improve as thyrotoxicosis is treated in some patients and in patients who do not have hyperthyroidism¹¹. In our study we have found 28% prevalence of upper lid retraction in patients. GO is the most common cause of unilateral and bilateral exophthalmos, but proptosis often does not correlate well with other facets of GO and has been considered by several authors to be a relatively insensitive diagnostic feature.

It has been proposed that proptosis in GO to be due to increased orbital fat but CT scan and other imaging techniques confirmed that in most patients proptosis results primarily from enlargement of extra ocular muscles, glycosaminoglycans deposition, although in some patients the orbital fat compartment alone may be increased¹²⁻¹⁴.

In our study 1 patient shown proptosis of about more than 28 on hurtel's exophthalmometer while about 61% of patients shown axial proptosis of >21 on hurtel's exophthalmometer.

Exophthalmos was present in 62% of patients in Bartley study, Iranian study it was about 77.6%.

Determining the prevalence of ophthalmopathy in Graves' disease depends to a great extent on the detection method. Although up to half of patients with Graves' hyperthyroidism have ophthalmopathy on clinical grounds. In our study, In hyperthyroid patients almost 95%, in hypothyroid patients about 12.5% and in euthyroid group none of the patients shows ocular myopathy.

Our finding confirm the conclusion of Trokel and Jakobiec¹⁵⁻¹⁶ that the extraocular muscles are the most consistently involved tissue in GO. In present study, inferior rectus, superior rectus, medial rectus and lateral rectus were respectively the most common involved muscles (48%, 31%, 15%, and 6% respectively). These data are not similar to report of Wiersinga which concluded that, inferior rectus, medial rectus, superior rectus, and lateral rectus were respectively the most common involved muscles (68%, 55%, 38%, and 15% respectively).

Conclusion: Our study concluded a significant number of the thyroid patients that are referred to our hospital. Because of the referral of these patients, it is possible that only complicated cases be referred, so that it can be one of the possible causes of selection bias in this study.

On the other hand lack of good follow-up is a drawback in our study. Lastly, our study findings are compatible in frequency of signs and symptoms, & demographic distribution. We suggest a large prospective study to confirm any difference in clinical manifestation of GO between Indian patients and other reported countries.

References:

- Gleeson H, Kelly W, Toft A, et al. Severe thyroid eye disease associated with primary hypothyroidism and thyroid-associated dermopathy. *Thyroid*. 1999; 9(11):1115-8
- Bartley GB. The epidemiological characteristics and clinical course of ophthalmology associated with autoimmune thyroid disease in Olmsted Country, Minnesota. *Trans Am Ophthalmol Soc*. 1994;92:477-588
- Perros P, Crombie AL, Matthews JNS et al. Age and gender influence the severity of the the thyroid-associated ophthalmopathy: A study of 101 patients attending a combined thyroid eye clinic *endocrinol(oxf)*. 1993(4):367-72
- boboridis k, perros p general management plan. In wiersinga wm, kahaly GJ, eds *Graves' ophthalmopathy. A multidisciplinary approach*, basel, Karger 2008;88-5.
- ferros p, neoh c, disckinson J, Thyroid eye disease. *clinical review, BMJ* 2000;338-05
- Inoue D, Sato K, Maeda M, et al. Genetic differences shown by HLA typing among Japanese patients with euthyroid Graves' ophthalmopathy, Graves' disease and Hashimoto's thyroiditis: Genetic characteristics of euthyroid Graves' ophthalmopathy. *Clin Endocrinol (Oxf)*. 1991;34(1):57-62
- Hagg E, Asplund K, TED related to smoking? *Br Med J*. 1987;295:634-5
- Heufelder AE, Joba W. Thyroid associated eye disease and strabismus, 2000 :8 (20:11)
- Wiersinga WM, Bartal et al. Epidemiology and prevention of Graves' ophthalmopathy. 2002;12:855-860
- Bartley GB, Fatourechi V, Kadrmas EF, Jacobsen SJ, Ilstrup DM, Garrity JA et al. The incidence of Graves' ophthalmopathy in Olmsted County, Minnesota. 1995;120:511-751
- Eden KC, Irotter WR. Lid retraction in toxic diffuse goiter. 1962;2: 385-370
- Halesl B, Rudle FF. Ocular changes in Graves' disease: a long-term follow-up study. 1960;29:113-126
- Frueh BR, Garber F, Grill R, Musch DC. Positional effect on exophthalmometer readings in Graves' eye disease. 1985;103(9):1355-1356
- Forbes G, Gorman CA, Brennan MD, Gehring DG, Ilstrup DM, Earnest F 4th. Ophthalmopathy of Graves' disease: computerized volume measurements of the orbital fat and muscle. 1986;7(4):651-656
- Villalid MC, Yokoyama N, Izumi M, Nishikawa T, Kimura H, Ashizawa K et al. Untreated Graves' disease patients without clinical ophthalmopathy demonstrates a high frequency of extra ocular muscle (EOM) enlargement by magnetic resonance. 1995;80:2830-2833
- Trokel SL, Jakobiec FA. Correlation of CT scanning of orbital disease. 1980;87:503-517

Conflict of interest: None
Funding: None
Cite this Article as: Damor M, Dangi R, Kumari AD, Jain D, Taviyad P. Descriptive Prospective Epidemiological Study In Thyroid Eye Disease In Tertiary Eye Care Hospital. <i>Natl J Integr Res Med</i> 2024; Vol.15(1): 23-27