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Prevalence of Ocular Morbidity among Thyroid Patient in Northwest Uttar Pradesh India

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Abstract:

- ***Aim:***
  To assess the prevalence of ocular morbidity among thyroid patients in northwest Uttar Pradesh, India

- ***Method:***
  A Prospective cross-sectional study was conducted among patients presenting with thyroid eye disease approaching Department of Ophthalmology, Teerthanker Mahaveer Hospital and Research Centre Moradabad (U.P) India. A total of 50 patients were included in the study. All patients underwent detailed ophthalmic evaluation and thyroid eye disease workup with dry eye. Patients were categorized into Euthyroid, Hypothyroid, and Hyperthyroid according to their thyroid levels.

- ***Result:***
  Mean age of Hypothyroid patient were 42.1±15.48, mean age of Hyperthyroid patient were 13.3±8.62 and mean age of Euthyroid patients 41.68±14.32. All three groups were divided into grades from Grade0-GradeVI according to the severity of disease,100% Euthyroid were in grade 0 and hypothyroid in Grade I same as in Hyperthyroid 66.60% patient were in Grade I and 33.30% in Grade II.62% of patients were taking medicine out of them 56% were taking thyroxin and 6% were taking Thyrocab. Dry eyes were also related to a thyroid disease, 100% Euthyroid patients were suffering from mild dry eye while hypothyroid and hyperthyroid patients were suffering from moderate dry eye.

- ***Conclusion:***
  Visual morbidities may manifest months after thyroid illness or thyroid eye disease first appears. Males and old age participants are linked with visual morbidity in TED. After receiving therapy for their ocular issues, a considerable percentage of TED patients achieve excellent vision. In individuals with systemic thyroid disease, we advise routine complete eye examinations.

Keywords: *Euthyroid, Hypothyroid, Hyperthyroid, Thyroid Eye Disease, Ocular Symptoms.*

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I. INTRODUCTION

One to two billion people worldwide are estimated to have refractive errors. In 2013, globally, 9.5 million people were found blind due to refractive error. 80% of Asians and 20% of Europeans are suffering [1] One of the most similar causes of blindness is refractive error. The visual quality of life is far clearer than a camera with regular eyes. The global public health problem of myopia affects people of all ages [2] Though today the metabolic disorder, diabetes mellitus, is growing like an epidemic in India, Thyroid dysfunction is the second-most common hormonal disorder. Thyroid dysfunction affects not only the biochemistry but also the quality of life [3] As we know, the human body is a complex system, and every gland or organ shows a combined effect. The thyroid gland secretes hormones that affect the metabolism of the body [4] The quantity of hormones is very small, and it is in micrograms. The excess secretion of hormone is Taneda's. Hyperthyroidism, while low or less secretion causes hypothyroidism. Beside this, our pituitary gland secretes TSH, which regulates the secretion of tri-iodothyronine (T3) and triiodothyronine by the feedback

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mechanism. Our body maintains the normal value of thyroid hormone [5]

Thyroid disorders are among the most common endocrine abnormalities worldwide and have been increasingly associated with various ocular manifestations, collectively termed ocular morbidity. These manifestations range from mild symptoms such as dry eye and lid retraction to more severe complications like proptosis, diplopia, and compressive optic neuropathy, particularly in patients with thyroid-associated ophthalmopathy (TAO), a condition frequently linked to Graves' disease. The prevalence of ocular morbidity in thyroid patients can significantly impact quality of life and may lead to long-term visual impairment if not identified and managed promptly. Understanding the prevalence and pattern of ocular involvement in thyroid patients is crucial for early diagnosis and intervention. Several studies, including those by Bartalena et al. (2008), emphasize the importance of interdisciplinary collaboration between endocrinologists and ophthalmologists to improve patient outcomes. This research aims to evaluate the prevalence and types of ocular morbidity among thyroid patients in order to enhance clinical awareness and management strategies. [6]

II. METHODOLOGY

A prospective, cross-sectional, descriptive clinical study conducted was among the students of Teerthanker Mahaveer University, Moradabad. Total 50 participants were enrolled in this study. The first section contained socio-demographic information of the respondent i.e., age, gender, religion and qualification. The second section contained patient Performa. Ophthalmic examination was performed for every participant. Details of participants and their identities were kept confidential. Data was fed into the MS Excel and those data was analyzed using MS Excel. Data interpretation, descriptive (frequency, percentage, mean and standard deviation) were used.

III. RESULTS

A total of 50 participants were included in the study, comprising 19 (38%) Euthyroid, 3 (6%) hyperthyroid, and 28 (56%) hypothyroid individuals. The gender-wise distribution of thyroid status is summarized in Table 1.Among the Euthyroid group, the majority were males (17 out of 19; 89%), while females constituted only 2 cases (10%). In the hyperthyroid group, 1 (33%) was male and 2 (66%) were female. The hypothyroid group showed a predominance of females, accounting for 20 out of 28 cases (71%), with males comprising 8 cases (28%).These findings suggest a higher prevalence of Euthyroidism in males, while hypothyroidism was more common among females in the study population.

Table 1

Gender wise Distribution						
Gender	Euthyroid		Hyperthyroid		Hypothyroid	
	N	%	N	%	N	%
Male	17	89	1	33	8	28
Female	2	10	2	66	20	71
Total	19		3		28	

The distribution of thyroid function status across different age groups is summarized in Table 2. No cases of Euthyroid, hyperthyroid, or hypothyroid status were observed in individuals aged 0–16 years.

Among the 17–30 year age group, 15.7% of Euthyroid cases, 33.3% of hyperthyroid cases, and 21.4% of hypothyroid cases were observed. The majority of cases in all three thyroid status categories were seen in the 31–45 year age group, comprising 63.1% of Euthyroid, 66.6% of hyperthyroid, and 50% of hypothyroid individuals. In the age group above 45 years, 21% of Euthyroid and 28.5% of hypothyroid cases were recorded, while no hyperthyroid cases were found in this group. This indicates that thyroid dysfunction, particularly hypothyroidism, is more commonly observed in the middle-aged and older populations.

Table 2

Age wise Distribution						
Age	**Euthyroid**		**Hyperthyroid**		**Hypothyroid**	
	N	**%**	**N**	**%**	**N**	**%**
0-16	0	0	0	0	0	0
17-30	3	15.7	1	33.3	6	21.4
31-45	12	63.1	2	66.6	14	50
>45	4	21	0	0	8	28.5

The distribution of dry eye severity among participants with different thyroid statuses is summarized in Table 3. Among individuals classified as Euthyroid, all (n = 19; 100%) exhibited mild dry eye. In contrast, no Euthyroid participants were found to

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have moderate, severe, or very severe dry eye. Among hyperthyroid individuals, all participants (n = 3; 100%) exhibited moderate dry eye, with no cases of mild, severe, or very severe dry eye observed. Similarly, among hypothyroid participants, all (n = 28; 100%) presented with moderate dry eye, while no individuals in this group exhibited mild, severe, or very severe dry eye. Notably, no cases of severe or very severe dry eye were identified in any thyroid status group.

Notably, no cases of severe or very severe dry eye were identified in any thyroid status group. This indicates that while dry eye severity varied with thyroid function, the condition remained within the mild to moderate range across all groups.

Table 3

Eye health Status Distribution						
	Euthyroid		Hyperthyroid		Hypothyroid	
	N	%	N	%	N	%
Mild Dry Eye	19	100%	0	0	0	0
Moderate Dry Eye	0	0	3	100%	28	100%
Severe Dry Eye	0	0	0	0	0	0

IV. DISCUSSION

With a variety of contributing causes, thyroid-related eye illness can manifest in Euthyroid, hypothyroid, or hyperthyroid states. Recently, a composition of 4 factors was reported by Wiersinga et al. in newly diagnosed Graves' disease as a predictive score for the beginning and development of Graves' orbitopathy. Included were the clinical activity score, the duration of hyperthyroidism, the signs and symptoms brought on by TSH-binding inhibitory immune globulins, and smoking.[6] Our goal was to determine if having diabetes mellitus concurrently has an effect on how TED develops and progresses, as well as whether DM may be utilized to predict how TED would turn out. 31.4% of all the TED patients that were recruited also had diabetes. 53.2% of the participants in a research by Moli et al. had Diabetes and TED their examination of type 1 and type 2 Diabetes may be the cause of the variance in occurrence between our investigation and theirs. [7]With the predominance of diabetes at the time, Kalman and Mouritz reported a similar discovery in a group of 462 TED patients in the Netherlands 18 years ago. When diabetes prevalence was 3.1% in a group of four hundred sixty two Netherland's patient of TED 18 years ago, Kalman and Mouritz found a similar discovery.[7] This could be explained by a recent rise in the prevalence of type 2 diabetes in general.

The distribution of gender in our study follows a same pattern to the prior data; females were predisposition in the ratio of 1.23:1, according to the study by Burch and Wartofsky, being 2:1, and the typical prevalence of autoimmunity in women. [8] It has been established that men have a higher prevalence of acquiring TED, & men with Graves' illness may have even higher risks of doing so. Males with TED typically present later in life and with a more severe type of ocular dysfunction. [1, 10] In line with the other research, our analysis also reveals a greater percentage of guys in the severe TED category, 67.7%, and a mean age of 49.8 years for males.

Smoking, however, can also confuse the greater severity of TED in males. 18 individuals (17.1%) had severe TED. 77.7% of them had diabetes. According to Moli et al., type 2 DM patients experience TED most severely and more frequently.[9] 90% of the individuals with severe TED who had Dysthyroid Optic Neuropathy—55.5% of whom also had diabetes—were diabetics. A group of 58 individuals with Dysthyroid Optic Neuropathy, 15.5 of whom had diabetes, was described by Neigel et al.[11] After that, the 1999 according to Kalman and Mouritz study found that 26.3% of the Dysthyroid Optic Neuropathy group had diabetes, compared to 3.1% of entire GO population.[7] Because of their vasculopathy, diabetics' optic nerves receive only marginal oxygenation, making them more vulnerable to pressure due to apical crowding by larger Extraocular muscles, might be the explanation for the higher prevalence of Dysthyroid Optic Neuropathy in diabetics.[7] Furthermore, according to recent radiological investigations, Dysthyroid Optic Neuropathy is always accompanied by either apical crowding or stretching of the optic nerve.[12] Additionally, studies have indicated that diabetics and Dysthyroid Optic Neuropathy patients either respond poorly or not at all to decompression of orbit.[7,13] The increased prevalence of diabetic's Dysthyroid Optic Neuropathy raises suspicions about the conditions of the concurrent nature &raises the possibility that it might serve as a strong indicator of severe TED.

V. CONCLUSION

In conclusion, visual morbidities may manifest months after thyroid illness or thyroid eye disease first appears. Males and old age participants are linked with visual morbidity in TED. After receiving therapy for their ocular issues, a considerable percentage of TED patients achieve excellent vision. In individuals with systemic thyroid disease, we advise routine complete eye examinations.

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