



RESEARCH ARTICLE

STUDY OF DRY EYE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS AT RURAL TERTIARY CARE HOSPITAL

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Abstract

Purpose: Not much attention is given to evaluation of ocular surface abnormalities in diabetics. This study has been carried out to evaluate factors like age, sex, duration of diabetes in causing dry eye in type 2 diabetics along with evaluation of tear film stability using various tests like Schirmers test and Tear film break up time.

Materials and Methods: In this observational cross-sectional study, 50 patients were examined, who were a diagnosed case of type 2 diabetes mellitus. Detailed history, anterior segment evaluation was done. Ocular surface evaluation was done using tear film break up time and Schirmer's test. Ocular surface disease index Questionnaire was taken.

Results: Among 50 patients with diabetes 46% of patients had dry eye. All patients who had diabetes for more than 20 years had dry eye and just 31.57% had dry eye who had diabetes for less than 5 years. It was found that Diabetics showed reduced Schirmer, TBUT measurements.

Conclusion: Patients with type II diabetes have higher prevalence of dry eye. Evaluation of diabetic patients using the OSDI questionnaire can be helpful in identifying dry eye in early stages. Significant reduction in TBUT and Schirmer test was found in diabetic patients.

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Introduction:-

Diabetes is an ongoing and growing public health issue, and blindness that is due to diabetic retinopathy (DR) remains a leading cause of adult-onset blindness^[1]. India leads the world in diabetic population and estimated to have 62.4 million people with diabetes, and 77.2 million with prediabetes^[2].

Research suggests that maximum instances of dry eye related to diabetes are as a result of inadequate manufacturing of tears due to "autonomic neuropathy" affecting the nerves that manage the lacrimal gland.^[1]

Studies have proven an intimate relationship between dry eye and diabetes mellitus (DM) with changes of conjunctival surface^[3].

In addition to this, neurotrophic deficiency, previous surgeries (such as corneal transplantation, extracapsular cataract procedures and refractive surgery), or long-term use of medications which create toxicity in the eye can predispose to dry eye. Many systemic medications, such as diuretics, antihistamines, antidepressants, psychotropics, cholesterol lowering agents, beta-blockers and oral contraceptives may also be associated with dry eye^[4].

Dry eye was thought to be associated with a decrease in the production of tears but the problem also lies in the quality and not the quantity of tears produced. The two main types of dry eye include aqueous deficient and evaporative type of dry eye. The principal pathological mechanisms of dry eyedisease are hyperosmolarity and inflammation. These mechanisms areinterrelated and lead to a self-perpetuating "vicious circle"⁽⁵⁾.

It is a major public health problem and is one of the most frequently encountered clinical diagnosis in ophthalmic practice, with a prevalence ranging from 5% to 35% ^{[6][7][8]} This may be attributed to prolonged use of digital devices, environmental pollution and changing lifestyle.

Early diagnosis of dry eye syndrome in diabetic patients is important for improving the ocular surface and quality of vision⁽⁹⁾.

Materials And Methods:-

In this observational, Cross-sectional study, 50 patients were examined, who were a diagnosed case of Type 2 DM, from Sept 2021- March 2022, after ethical clearance and taking informed consent.

We excluded-

1. Patients with systemic diseases or local ocular disease/surface abnormalities (Chemical Burns, Vernal Keratoconjunctivitis, Vitamin A deficiency) assessed by history and clinical examination, other than diabetes mellitus, which are known to cause dry eyes/ocular surface abnormalities.
2. Patients who are/were chronic contact lens wearer.
3. Patients who have had undergone ocular surgeries or on topical medications causing dry eye.
4. Patients less than 17 years of age.

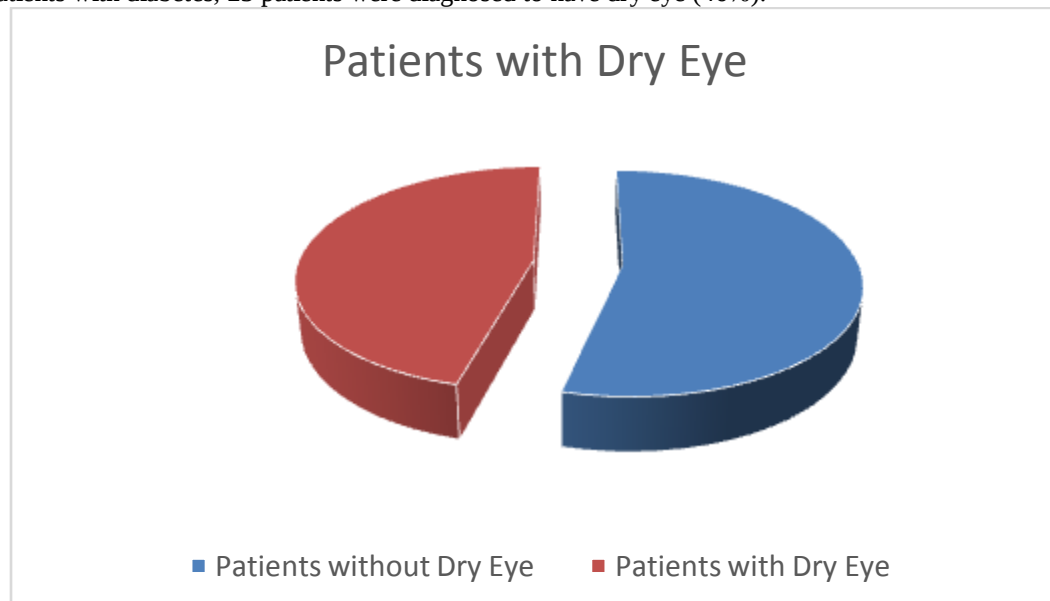
Data was recorded after detailed history and careful examination in a structured proforma including- Name, Age, Gender, type of diabetes, duration, type of treatment and recent Blood Sugar levels.

Ocular Surface Disease Index Questionnaire was taken consisting of 12 questions and patients were categorized as:Normal (0-12), Mild dry eye (13-22), Moderate dry eye (23-32) and Severe dry eye (33-100).

Tear film breakup time and Schirmers test was performed.

Results:-

Among 50 patients with diabetes, 23 patients were diagnosed to have dry eye (46%).

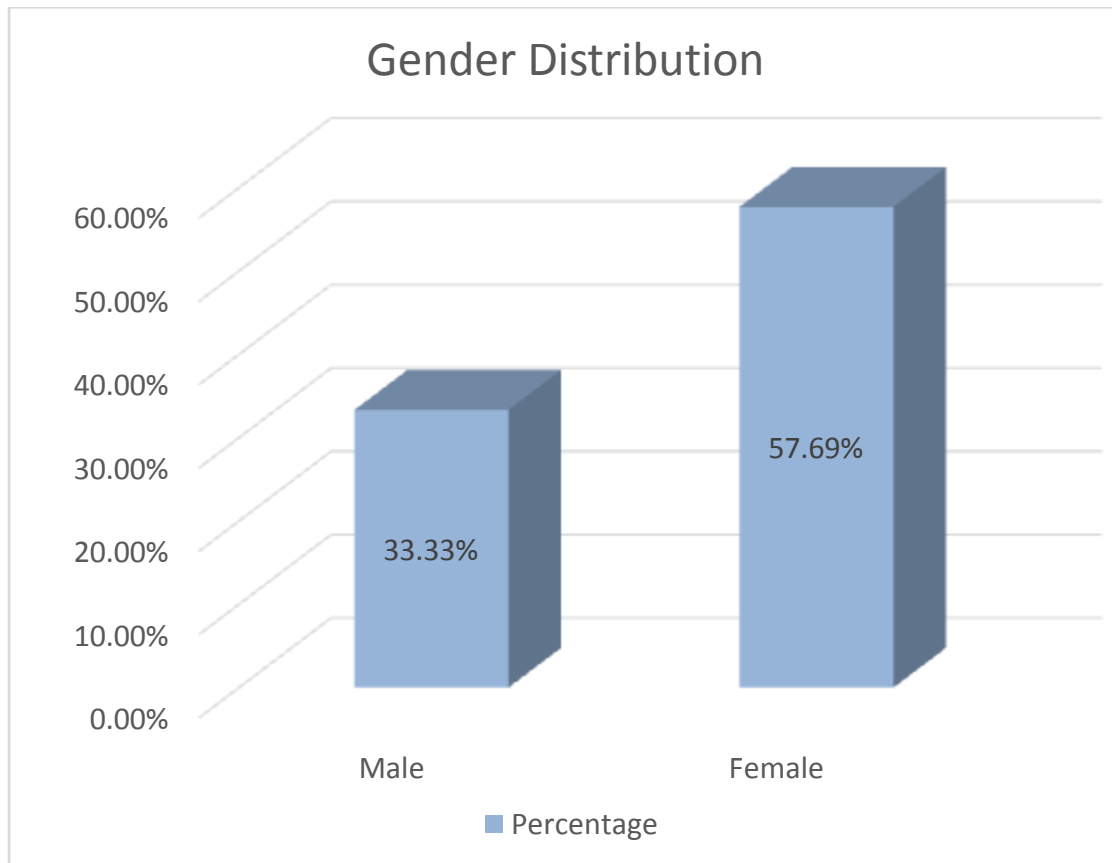


Out of 9 patients with age more than 60, 5 had dry eye (55.55%), compared to that 15 patients of age between 30-40, only 4 had dry eye (26.66%)

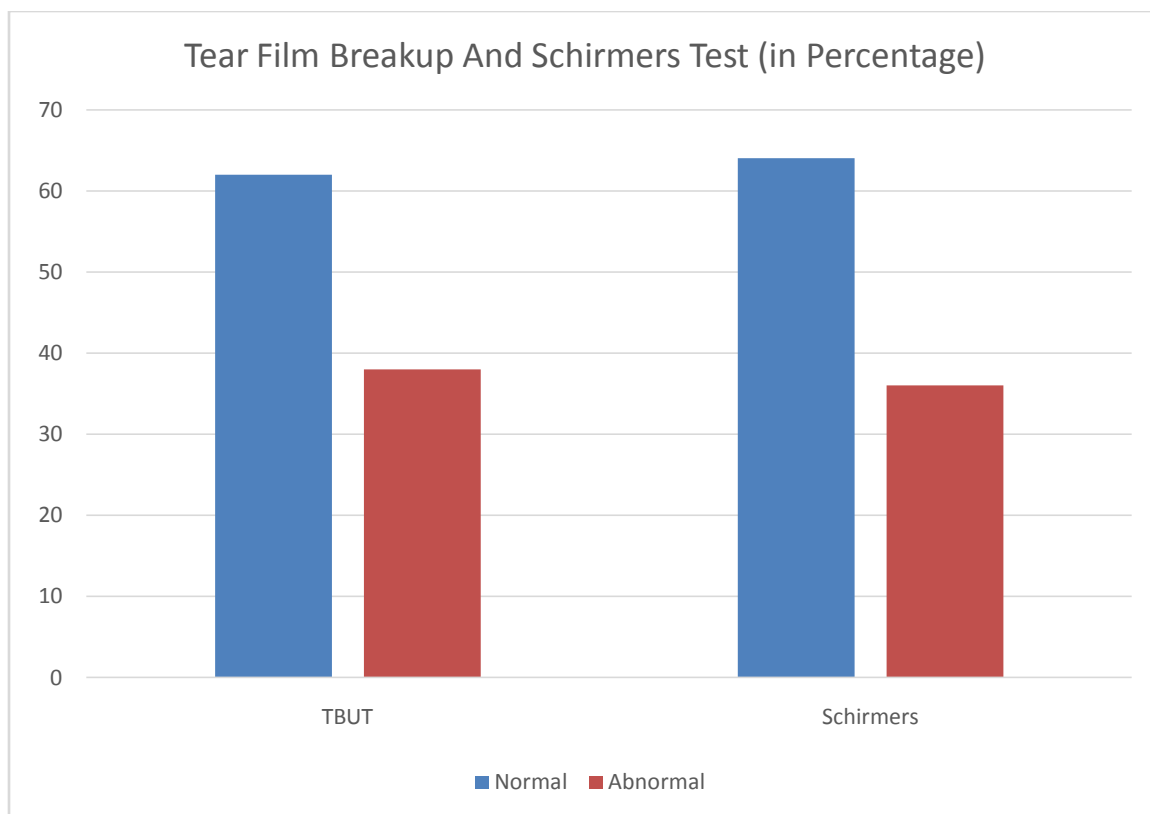
Age Group	Total Patients	Patients with Dry Eye	Percentage of Patients with Dry eye
<30 Years	0	0	0%
30-40	15	4	26.66%
41-50	14	7	50%
51-60	12	7	58.33%
>61	9	5	55.55%
	Total=50	Total=23	

In our Study, out of 6 patients with diabetes for more that 20 years,all 6 had dry eyes(100%), compared to that 19 patients who had diabetes for less than 5 years, only 6 patients had dry eye (31.57%).

Of the 50 consecutive patients included in the study, 24 were male and 26 were female. Among 24 male patients, 8 patients (33.33%) had dry eye and among 26 females patients, 15 patients (57.69%) had dry eye symptoms. Slightly higher preponderance among female patients which could be attributed to thinner lipid layer of the tear film of the females⁽¹¹⁾.



(Tear Film Breakup time)TBUT was abnormal in 38% of diabetics. Among them 78% had mild-moderate values while severe dry eye was found in 21.05% of patients. Schirmers test was abnormal in 36% of diabetics. Among them 77.77% had mild-moderate values while severe dry eye was found in 22.22% of patients.



Presence of autonomic dysfunction, abnormalities in the tear film dynamics, decrease in corneal sensation, along with microvascular damage to lacrimal gland contribute to the increased prevalence of dry eye in diabetics.

Discussion:-

According to a study done by Manaviat et al, as the age increased, the occurrence of dry eye also increased significantly⁽¹⁰⁾. In our study of 9 patients with age more than 60, 55.55% had dry eye, compared to that 15 patients of age between 30-40, only 4 had dry eye (26.66%).

According to study done by S E Moss et al higher incidence of dry eye was seen in females as compared to males⁽¹¹⁾. Similar findings were noted in our study, 33.33% males had dry eye and 57.69 females had dry eye.

Reddy OR et al in their study found that as the duration of diabetes increased, the occurrence of dry eye also increased significantly.⁽¹²⁾ Similar findings were noted in our study.

A study by Dogru et al also noted significantly reduced TBUT and Schirmer test values in diabetic patients with peripheral neuropathy and poor metabolic control⁽¹³⁾.

Conclusion:-

Patients with type II diabetes have higher prevalence of dry eye and evaluation of diabetic patients using the OSDI questionnaire is helpful in identifying dry eye in early stages.

It was found that incidence of dry eye increased with duration of diabetes.

Significant reduction in Tear film breakup time and Schirmer test was found in diabetic patients

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Nil.

Conflicts of interest-

None.

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