



## **PROPORTION OF DRY EYE IN DIABETES MELLITUS PATIENTS.**

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### **Abstract**

**Purpose:** The main purpose of this study is to review the proportion of dry eye in patients of diabetes mellitus.

**Study Design:** Descriptive cross-sectional study.

**Duration and Place of Study:** Ophthalmology department, The university of Lahore teaching hospital, Lahore, From August 2018 to February 2019.

**Material & Methods:** Data was collected by self-designed proforma after taking consent from patient. The schirmer test was performed. The study was conducted on 80 patients having positive history of Diabetes mellitus. The sample size was collected by non-probability convenient method. All patients were diagnosed with Diabetes mellitus by Department of Medicine, The university of Lahore teaching hospital Lahore. Patients having any other systemic disorders were excluded from the study. Schirmer test was used for the measurement of tear film breakup time. Data was collected by a self-designed proforma after written informed consent. Data entry and statistical analysis was done by Arithmetical Software SPSS.

**Results:** The schirmer test was performed to assess dry eye in patients with diabetes mellitus. The results showed that total 80 patients were assessed out of 80, 30 (37.5%) were males and 50 (62.5%) were females. Study shows 39 (48.70%) patients have mild (9-14mm) schirmer test value, 12 (15.%) patients have moderate (4-8mm) schirmer test value and 29 (36.2%) patients have severe (<4mm) schirmer test values.

**Conclusion:** It is concluded that there is risk of dry eye in diabetic patients.

**KEY WORDS:** Dry eye in diabetes, ocular surface changes in diabetic mellitus patients.

## **INTRODUCTION:**

Dry eye is a state in which eyes does not generate tears appropriately and individual has not adequate feature of tears to lubricate the eye and has insufficient capability for tear production from the tear film. Symptoms of dry eyes are visual disorder, uneasiness, itching, tear film unsteadiness and swelling of ocular float up.<sup>1</sup>

A recent research results showed that more than 284 million populace in the world are exaggerated with diabetes mellitus but the prevalence of diabetes mellitus in Pakistan is mostly in adult population and ratio is 6.7 million<sup>2</sup>.

Diabetes mellitus is a risk aspect for dry eye syndrome. Dry eye syndrome affect the feature of living and cause visual disorder it also affect the corneal surface. So it is predictable as public health predicament. There is a brawny relationship between dry eye diseases and diabetes mellitus.<sup>3</sup>

Dry eye causes keratoconjunctivitis and this anomaly is seen in the diabetic population. Recent Study indicates that 54% frequency of diabetes mellitus have asymptomatic and symptomatic dry eye disorder.<sup>4</sup>

The International Diabetes Federation anticipated that the global diabetes epidemic continuerising. According to the description of the international diabetes federation study in 2013, Chinese population has the biggest figure of diabetes mellitus (98.6 millions) and this figure nowadays raised in Indian population (65.2 million) and in the American population (24.5 million).<sup>5</sup>

Diabetes mellitus has been acknowledged as one of the most important systemic disorder which effect eyes and causes dry eyes. The concluded incidence of research showed that dry eye disorder in diabetics is 16–33% in persons of sixty years of oldness and is fifty percent more in women.<sup>6</sup>

Tear film values after hemodialysis were found to be larger than before performing this process in normal subjects. On the other hand, there was no effect of duration on hemodialysis treatment between two groups.<sup>7</sup> Basal tear secretion was found to be different in diabetic patients as compared to normal groups. This variance may be a feature which shown the lesser frequency of dry eye disorder in normal population as compared to diabetic population.<sup>8</sup>

A study showed the relation of diabetes mellitus with dry eye dysfunction. The Study included 86 diabetic patients associated with retinopathy and 84 normal subjects. Schirmer test was performed to find out the tear film breakup time. In insulin dependent subjects tearing reflex was

decreases as compared to normal subjects. No significant changes were observed between normal and diabetic subjects regarding tear film changes on schirmer test. In both groups proportion of dry eye symptoms was same. However it was found that diabetic patients have decreases schirmer test values as compared to normal subjects. So it was concluded that subjects with type 1 diabetes mellitus have changes in conjunctival surface and basal layer but tear film values were normal for those subjects.<sup>9</sup>

A study showed total 50 patients of diabetesmilletus. In all patients who were selected in study to check the relationship between dry eye disorder and diabetes mellitus. Out of fifty patients 38 patients have type 2 diabetes, peripheral neuropathy and diabetic retinopathy. It was concluded that diabetic patients have higher osmolarity rate related to dry eye disease. 52 % dry eye symptoms related with mild dry eye syndrome but it was observed that individuals with higher rate of tear osmolarity showed dry eye and people with a wide-ranging period of diabetes presented not as much of dry eye signs. So it was concluded that diabetic patients should be checked regularly to assess the dry eye diseases which could have an effect on vision.<sup>10</sup>

Hospital-based study showed that dry eye disorder is additionally widespread in individuals with diabetic retinopathy ( $P = 0.006$ ) compared to the non-diabetic retinopathy group. The values of diabetic retinopathy in dry eye diseases were 2.29 ( $P = 0.015$ ), both dry eye complaint and the diabetic retinopathy were related by category of 1 diabetes mellitus.<sup>11</sup>

Recently another study was conducted on 21 patients to check the relation between dry eye syndrome and diabetic retinopathy relating to kidney diseases. So it was demonstrated that systematic assessment of these clinical parameters in patients with visual impairment and diabetes in order to promote opportune diagnosis and treatment<sup>12</sup> A study showed the relation of diabetes millets with dry eye dysfunction. Study included 86 diabetic patients associated with retinopathy and 84 normal subjects. Schirmer test was performed to find out the tear film breakup time. In insulin dependent subjects tearing reflex was decreases as compared to normal subjects. No significant changes were observed between normal and diabetic subjects regarding tear film changes on schirmer test. In both groups proportion of dry eye symptoms was same.<sup>13</sup> However it was found that diabetic patients have decreases schirmer test values as compared to normal subjects. So it was concluded that subjects with type 1 diabetes mellitus have changes in conjunctival surface and basal layer but tear film values were normal for those subjects.<sup>14</sup>

Another research was showed to measure the occurrence and severity of dryness in diabetes milletus patients. Total 63 patients were enrolled 38 in diabetic and 25 non-diabetic group. It was concluded that overall presence and severity of dry eye was found to be similar in diabetic and non-diabetic groups.<sup>15</sup>

Recently another study was conducted on 21 patients to check the relation between dry eye syndrome and diabetic retinopathy relating to kidney diseases. So it was demonstrated that systematic assessment of these clinical parameters in patients with visual impairment and diabetes in order to promote opportune diagnosis and treatment<sup>16</sup>.

**MATERIAL AND METHODS:**It was descriptive cross sectional study conducted on 80 patients. The Sample size is collected by non probability convenient method. In this study diabetic patients included. The patients having other systemic disorder excluded from the study. Data was collected by a self-designed proforma after written informed consent. Entirely the statistics was entered and investigated by Arithmetical Software SPSS version 22.00.



**RESULTS:**

**FIGURE 1**

**Distribution of Gender:**

		<b>GENDER</b>			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	30	37.5	37.5	37.5
	Female	50	62.5	62.5	100.0

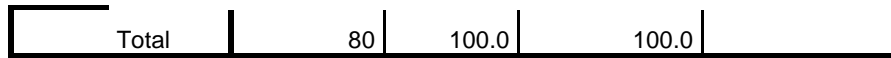


Figure illustrates that Out of 80, 30(37.5%) were males and 51(62.5%) were females.

**FIGURE 3**

**Distribution of Schirmer Test**

Schirmir.Test				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mild	39	48.8	48.8
	moderate	12	15.0	63.8
	severe	29	36.3	100.0
	Total	80	100.0	100.0

Figure shows 39(48.8%) patients have mild (9-14mm) schirmer test value, 12(15.0%) patients have moderate (4-8mm) schirmer test value and 29(36.3%) patients have severe (<4mm) schirmer test values.

## DISCUSSION:

The study shows dry eye and ocular surface changes related to tear film by schirmer test in diabetic patients.<sup>17</sup> So tear film components reduced in patients with diabetes mellitus. To evaluate the ocular surface and systemic factors related to diabetes mellitus which shows tear film values related to age and sex.<sup>18</sup> Dry eye is most common in older patients as patients get older ocular surface become dry. Corneal changes are also related with the diabetes mellitus which suggests that patients could have abnormalities in cornea. Some studies showed reflex of tear film secretions which did not change.<sup>19</sup>

In diabetes, microvasculature of lacrimal gland is associated with impaired function of gland. In diabetic patients increased rate of dry eye is associates with tear film osmolarity and decreased corneal sensitivity. Most of the diabetic subjects complain of itching and burning sensation.<sup>20</sup> TBUT values for diabetic and normal subjects are different due to the symptoms of dry eye in diabetic patients. Diabetic individuals with dry eye have high frequency of dry eye symptoms as compared to diabetic subjects without dry eye.<sup>21</sup>

Studies found that women reported dry eye symptoms than men and which has etiology of multifactorial condition, in most cases, is chronic. Dry eye syndrome is a source of discomfort that affects the patient's quality of life, especially in older population. There are many methods to assess the dry eye. However, there is no common combination of tests which conclusively diagnose the dry eye. A key aspect of dry eye that remains a major problem is the lack of association between the symptoms and signs of dry eye and the poor test reproducibility of objective tests making it difficult to assess disease progression or the impact of treatments on symptoms. Currently, the major management for those patients with dry eye disease consists of palliative regimens such as lubricating drops, which target symptoms alone, with no treatment modality available that truly "treats" the underlying cause of the disease. The necessity for characterizing and understanding the underlying biomarkers in the ocular surface cells that are involved in the disease process may be beneficial in targeting towards treatment strategies. Many factors are involved in development of dry eye. Of these, age, gender and hormonal effects have captured much attention over the past years.<sup>22</sup>

## CONCLUSION

The schirmer test was performed to assess dry eye in patients with diabetes mellitus. The results showed that total 80 patients were assessed out of 80, 30 (37.5%) were males and 50 (62.5%) were females. Study shows 39 (48.70%) patients have mild (9-14mm) schirmer test value, 12 (15.%) patients have moderate (4-8mm) schirmer test value and 29 (36.2%) patients have severe (<4mm) schirmer test values

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