

DRY EYE DISEASE IN PATIENTS WITH DIABETES MELLITUS TYPE II

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ABSTRACT:

Background: Dry eye disease and Diabetes mellitus are two major public health problems which are increasing in incidence. This study is planned to determine the prevalence of dry eye disease in type 2 diabetic patients. **Method:** The present study was conducted on total of 60 persons between the age group of 40 – 60 years visiting the Ophthalmology Department of the Pacific Medical College and Hospital, Udaipur, out of which 30 persons were non-diabetic and 30 persons were suffering from Diabetes Mellitus type II. After performing a routine ophthalmic examination of measuring visual acuity, refraction and slit lamp examination, Schirmer test 1 (without anaesthesia) was performed. **Result:** In the age group of 40 – 50 years 9 diabetics (30%) were Schirmer test positive as compared with 4 subjects (13.3%) from the control group. In the age group of 51 – 60 years 13 diabetics (43.3%) were Schirmer positive as compared to 7 (23.3%) in the control group. The incidence of Schirmer positive test indicating presence of dry eye disease was observed to be high in diabetics (36.6%) as compared to the incidence in the control group (18.3%) with a higher incidence in the age group of 51 – 60 years in both the groups. **Conclusion:** It can be concluded that the incidence of dry eye disease is higher in diabetics and need to be diagnosed and treated early by health care providers.

Keywords: computers and mobile phones, environmental pollution, Schirmer test strip.

INTRODUCTION:

Dry eye disease and Diabetes mellitus are two major public health problems which are increasing in incidence. Prevalence of dry eye syndrome has been reported to be higher in diabetics affecting quality of life, hence needs to be diagnosed and treated. (1) Dry eye disease is a major cause of ocular discomfort, affects a large percentage of the population, the reported incidence varies from 5 to >30 percentage in the general population. (2, 3) The prevalence is

likely to increase in future due to increase in life expectancy, increased use of computers and mobile phones, environmental pollution, increased use of medications and increasing incidence of diabetes mellitus. With alarmingly high increase in the incidence of diabetes mellitus in India the dry eye disease incidence is also likely to increase, especially in the diabetic population as diabetes mellitus is a major risk factor for developing dry eye disease. The

reasons for developing dry eye in diabetes, according to Dry Eye Workshop (DEWS) are 1) decreased corneal sensitivity with a decrease in reflex lachrymal secretion and 2) reduced blink rate leading to increased tear evaporation. (4, 5) The present study was done to determine prevalence of dry eye disease in patients with diabetes mellitus type II having the disease for more than 5 years in the age group of 40- 60 years.

Commonly used methods for diagnosing dry eye disease are – Schirmer test, tear film breakup time (TBUT), tear meniscus height, tear osmolarity, symptom questionnaire like ocular surface disease index (OSDI) and Dry eye questionnaire (DEQ), having different specificity and sensitivity. Tear osmolarity determination is considered the most reliable test, but is time consuming and expensive, hence not suitable for Indian conditions. Tear film break up time is also an inexpensive method, but requires more co-operation from the patient on slit lamp and co-ordination with a stop watch. Schirmer test is a simple, inexpensive and objective method for diagnosing dry eye disease hence was used in the present study.

MATERIALS AND METHODS

The present study was conducted by following the principals of the Declaration of Helsinki (DoH) and after obtaining informed consent from the subjects included in the study. A total of 60 persons between the age group of 40 – 60 years visiting the Ophthalmology Department of the Pacific Medical College and Hospital, Udaipur were included in the study, out of which 30 persons were non-diabetic and 30 persons were diabetic suffering from Diabetes Mellitus type II

for duration of more than 5 years. The diabetic patients were those who came directly to the ophthalmic department for check up or were referred from medicine department.

Exclusion criteria: Persons with a history of systemic disease other than diabetes mellitus, past ocular surgery, lid deformities, on topical ocular medications, glaucoma, corneal pathology, ocular infections or inflammations were excluded from the study.

After performing a routine ophthalmic examination of measuring visual acuity, refraction and slit lamp examination, Schirmer test 1 (without anaesthesia) was performed after explaining the procedure to the subjects. Intraocular pressure was recorded after performing the Schirmer test and subjects with high intraocular pressure were not included in the study. Schirmer test strip (commercially available) was inserted at the junction of medial two third and lateral one third of the lower conjunctival fornix of both eyes simultaneously and the subject was instructed to keep eyes open, look straight and blink normally. The subjects whose amount of wetting remained 10 mm or less at the end of 5 minutes were labelled as the Schirmer test positive. In the subjects where wetting crossed 10 mm earlier than 5 minutes the test was aborted as soon as wetting crossed 10 mm mark.

RESULTS

Schirmer test 1 without anaesthesia was performed in 60 non diabetic persons (control group) and in 60 diabetic subjects having age between 40 to 60 years. A person was considered Schirmer positive if any one eye showed a wetting of less than 10 mm at the end of 5

minutes. Table 1 shows the results of the study. Out of 60 control subjects 11 were Schirmer positive whereas in the diabetic group 22 persons were Schirmer positive. Since the number of subjects was small, male and females were not grouped separately for statistical calculations.

Table 1: Results of Schirmer positive numbers in control and diabetic groups

Age group	Control		Diabetics	
	n	Schirmer positive	n	Schirmer positive
40 - 50 years	30	4 (13.3%)	30	9 (30%)
51 - 60 years	30	7 (23.3%)	30	13 (43.3%)
Total	60	11 (18.3%)	60	22 (36.6%)

In the age group of 40 – 50 years 9 diabetics (30%) were Schirmer test positive as compared with 4 subjects (13.3%) from the control group. In the age group of 51 – 60 years 13 diabetics (43.3%) were Schirmer positive as compared to 7 (23.3%) in the control group. The incidence of Schirmer positive test indicating presence of dry eye disease was observed to be high in diabetics (36.6%) as compared to the incidence in the control group (18.3%) with a higher incidence in the age group of 51 – 60 years in both the groups.

DISCUSSION

The prevalence of diabetes a known risk factor for developing dry eye disease is increasing at an alarming pace in India and is highest in the world. (6) Dry eye disease is a major cause of

ocular discomfort and vision related symptoms and its incidence is increasing in the general population due to lifestyle changes like increased use of mobiles and computers, air conditioned working environment and increasing incidence of diabetes and other diseases. The incidence of dry eye disease has been found to be high in diabetics than in non-diabetics.(1,7,8) The present study was undertaken to find the incidence of dry eye disease in diabetics (type 2) by performing Schirmer test without anaesthesia.(1) The incidence of dry eye disease in the present study was found to be 36.6% as compared to 18.3% incidence in the control group, with a higher incidence in the 51 -60 year aged subjects in both the groups. Some studies have found similar results 33% incidence of dry eye disease in diabetics. (7) Some studies have reported much higher incidence of dry eye disease in diabetics up to 54.3%. (1,8) The reasons for a lower incidence found in the present study could be due – 1) geographical and demographical differences 2) only Schirmer test was used in the present study – which was the only test which could be performed due to its simplicity and economical reasons in the subjects of this study who are mostly from rural or semi urban areas. However the results of this study are in agreement with other studies that the incidence of dry eye disease is much higher in diabetics.

Limitations of the study are 1) small number of subjects; 2) only Schirmer test was performed to diagnose; 3) only subjects with type 2 diabetes were included.

CONCLUSION

From the results of this study and earlier published studies, it can be concluded that the incidence of dry eye disease is higher in diabetics and need to be diagnosed and treated early by health care providers.

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