

ORIGINAL ARTICLE

Assessment of the clinical profile of dry eye in patients with Type-2 Diabetes Mellitus

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ABSTRACT:

Background: The present study was conducted for assessing the clinical profile of dry eye in patients with Type-2 Diabetes Mellitus. **Materials & methods:** 100 Type II Diabetes Mellitus patients under treatment were enrolled. The presence of any systemic disease, history of ocular surgeries, trauma or contact lens use and ocular medications was noted. Complete ocular examination was done in all the patients. Recording visual acuity with snellen's chart was done followed by slit lamp biomicroscopic examination. The objective tests were done further. Schirmer test, Tear film break up time (TBUT) and ocular surface staining. Based on these, the prevalence of dry eyes was evaluated. The data were collected from patients using a case report form. Data was entered in excel and analysed using SPSS. **Results:** Out of 100 patients, schirmer test was normal in 44 percent of the patients and abnormal for 56 percent of the patients. Out of 100 patients, Rose Bengal test was positive in 50 percent of the patients. Out of 100 patients, TBUT was positive in 58 percent of the patients and negative for 42 percent of the patients. In the present study, the overall prevalence of dry eyes was found to be 61 percent of the type-2 diabetic patients. **Conclusion:** Diabetic patients are at increased risk of developing ocular surface complications. Hence our study insists that clinical evaluation of dry eye should be an integral part of ocular examination in diabetic patients.

Key words: Dry eyes, Diabetes

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INTRODUCTION

Diabetes is one of the most common leading causes of blindness in 20–74-year old persons. Cataract and retinopathy are well-known as ocular complications of diabetes. Recently, problems involving the ocular surface, dry eyes in particular, have been reported in diabetic patients. These patients suffer from a variety of corneal complications including superficial punctate keratopathy, trophic ulceration, and persistent epithelial defect. Dry eye is an important contributor to these problems. Dry eye syndrome has many causes. One of the most common reasons for dryness is aging process.^{1, 2} The mechanism responsible for dry eyes is unclear, but autonomic dysfunction may be responsible. Aldose reductase, the first enzyme of the sorbitol pathway, may also be involved. The oral administration of aldose reductase inhibitors has been shown to improve the tear dynamics significantly.^{3, 4} Dry eye can lead to vision deficit, scarring and perforation of the cornea and secondary bacterial infection. If this syndrome is diagnosed at first stage and treated, would be protected from its complications.⁵ Hence; the present study was conducted for assessing the clinical profile of dry eye in patients with Type-2 Diabetes Mellitus.

MATERIALS & METHODS

100 Type II Diabetes Mellitus patients under treatment were enrolled. Data was collected from the

Type II Diabetes Mellitus patients who were willing to participate in the study. Patient data was collected according to the proforma. Medical history and history of extra ocular surgery and contact lens use was noted. A detailed history taking was done including age, sex, ocular symptoms, detailed history of diabetes with duration and treatment, history of allergy, drug intake, joint pain, chemical injury & Steven Johnson syndrome. The presence of any systemic disease, history of ocular surgeries, trauma or contact lens use and ocular medications was noted. Complete ocular examination was done in all the patients. Recording visual acuity with snellen's chart was done followed by slit lamp biomicroscopic examination. The objective tests were done further. Schirmer test, Tear film break up time (TBUT) and ocular surface staining. Based on these, the prevalence of dry eyes was evaluated. The data were collected from patients using a case report form. Data was entered in excel and analysed using SPSS.

RESULTS

40 percent of the patients belonged to the age group of 51 to 60 years. Mean age of the patients was 52.1 years. 65 percent of the patients were males while the remaining were females. Out of 100 patients, schirmer test was normal in 44 percent of the patients and abnormal for 56 percent of the patients. Out of 100 patients, Rose Bengal test was positive in 50 percent of the patients. Out of 100 patients, TBUT was

positive in 58 percent of the patients and negative for 42 percent of the patients. In the present study, the

overall prevalence of dry eyes was found to be 61 percent of the type-2 diabetic patients.

Table 1: Result of Schirmer test in dry eye patients

Schirmer Test	Range/ Score	Frequency	Percentage
Normal	≥ 5 mm	44	44
Abnormal	< 5 mm	56	56

Table 2: Result of Rose Bengal test in dry eye patients

Rose Bengal Test	Range/Score	Frequency	Percentage
Positive	≥ 3	50	50
Negative	< 3	50	50

Table 3: Result of tear film break up time in dry eye patients

Tear Film Break Up Time	Range/ Score	Frequency	Percentage
Positive	< 10 seconds	58	58
Negative	≥ 10 seconds	42	42

Table 4: Overall Prevalence of dry eyes

Dry eyes	Number of patients	Percentage of patients
Absent	39	39
Present	61	61

DISCUSSION

In 2007, the Dry Eye Workshop (DEWS) defined dry eye as "a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface." Dry eye disease (DED) is common and significantly affects quality of life. The estimated prevalence of DED for women and men over the age of 50 years in the United States is 3.2 million and 1.6 million, respectively. Compared with age-matched controls, patients with dry eye are two to four times more likely to experience difficulty with reading, carrying out professional work, using a computer, watching television, and driving. The assessment of tear film osmolarity may be helpful in the study of DED, as tear osmolarity changes have been shown to reflect disturbances of the tear film.⁶⁻⁹

40 percent of the patients belonged to the age group of 51 to 60 years. Mean age of the patients was 52.1 years. 65 percent of the patients were males while the remaining were females. Out of 100 patients, schirmer test was normal in 44 percent of the patients and abnormal for 56 percent of the patients. Out of 100 patients, Rose Bengal test was positive in 50 percent of the patients. Kaiserman I et al compared the prevalence of keratoconjunctivitis sicca (KCS) in a prospective cohort of 22,382 diabetic patients with that in the general population. They followed the electronic medical records of all patients in the district older than 50 years (159,634 patients) between January 1 and December 31, 2003. Of those, 22,382 (14.0%) had diabetes. The proportion of ocular lubrication consumers was compared among diabetic and nondiabetic patients. All HbA1c

laboratory tests performed by the diabetic patients were documented (41,910 tests), and glycemic control was correlated with the consumption of ocular lubrication. After age and gender adjustment, a significantly higher percentage of diabetic patients (20.6%) received ocular lubrication, compared with non diabetic patients (13.8%, $P < .001$). The difference was significant for all age groups and for both sexes ($P < .001$). A similar significant difference was prominent between diabetic and nondiabetic patients aged 60 to 89 years who were frequent users of ocular lubrication. Ocular lubrication consumption increased with poorer glycemic control (mean annual HbA1c levels). Multivariate analysis revealed this effect to be independent of age, sex, place of birth, or place of residence. KCS is significantly more common among diabetic patients. Poor glycemic control correlates with increased artificial tear use in diabetic patients.¹⁰

Out of 100 patients, TBUT was positive in 58 percent of the patients and negative for 42 percent of the patients. In the present study, the overall prevalence of dry eyes was found to be 61 percent of the type-2 diabetic patients. Alves Mde Cet al summarized the clinical and functional aspects of dry eyes. The observations indicated that metabolic, neuropathic and vascular tissue damages lead to an inflammatory process and functional degeneration. The physiopathological mechanism included hyperglycemia, advanced glycated end product accumulation, oxidative stress and inflammation mediated by NF-kappaB signaling pathways.¹¹ Schaumberg DA et al estimated the prevalence and risk factors for dry eye disease (DED) among US men. Cross-sectional prevalence survey among male participants 50 years and older in the Physicians'

Health Studies I (N = 18,596) and II (N = 6848). The prevalence of DED increased with age, from 3.90% among men aged 50 to 54 years to 7.67% among men 80 years and older. High blood pressure and benign prostatic hyperplasia were associated with a higher risk of DED. Use of antidepressants, antihypertensives, and medications to treat benign prostatic hyperplasia were also associated with increased risk of DED. They concluded that dry eye disease is prevalent and increases with age, hypertension, benign prostatic hyperplasia, and antidepressant use.¹²

CONCLUSION

Diabetic patients are at increased risk of developing ocular surface complications. Hence our study insists that clinical evaluation of dry eye should be an integral part of ocular examination in diabetic patients.

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