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Analysis of Prevalence of Dry Eyes in Diabetic Patients at a Tertiary Care Centre

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Abstract

Background: Dry eye (DE) is a multifactorial pathology characterized by a progressive dysfunction of the lacrimal and meibomian glands that typically lead to decreased aqueous tear production and increased tear evaporation, respectively. Hence; the present study was undertaken for assessing prevalence of dry eyes in diabetic patients. **Materials & Methods:** A total of 250 diabetic patients, who reported to the Department of Ophthalmology, RVRS Medical College & Attached group of Mahatma Gandhi Hospital, Bhilwara, Rajasthan (India) were enrolled in the present study. Complete demographic details of all the patients were obtained. Recording visual acuity with snellen's chart followed by slit lamp biomicroscopic examination was done. Tear films break up time (TBUT) was done in all the patients by instilling a 2% fluorescein dye into the inferior conjuctival fornix and allowing blinking several times before stopping. A value less than 10 seconds was taken as abnormal.
Results: Among diabetic patients, prevalence of dry eyes was found to be 55.6 percent. While correlating the prevalence of dry eyes with age-wise distribution of patients, non-significant results were obtained. However, significant results were obtained while correlating the prevalence of dry eyes with duration of diabetes. **Conclusion:** Significant proportion of diabetic population is affected by dry eyes, with its prevalence being directly proportional to the duration of diabetes.
Keywords: Diabetic Mellitus, Dry Eyes.

Introduction

Diabetes mellitus is frequently accompanied by microvascular complications like nephropathy, neuropathy and retinopathy. Neuropathy affects multiple systems, such as cardiovascular, genitourinary and gastrointestinal. The development of retinopathy is correlated with poor glycemic control and duration of diabetes[1-3]. Dry eye (DE) is a multifactorial pathology characterized by a progressive dysfunction of the lacrimal and meibomian glands that typically lead to decreased aqueous tear production and increased tear evaporation, respectively[4-6]. The International Diabetes Federation (IDF) estimates that the global diabetes epidemic continues increasing. While diabetic retinopathy (DR) and diabetic cataracts are well-known complications, dry eye syndrome (DES), also referred to as keratoconjunctivitis sicca, is also common in the diabetic population. Studies have indicated 54% prevalence of asymptomatic and symptomatic DES, in diabetes. However, the relationship between diabetes and DES still remains unclear[5-7]. Hence; the present study was undertaken for assessing prevalence of dry eyes in diabetic patients.

Materials & methods

The present study was conducted in the Department of Ophthalmology, RVRS Medical College & Attached group of

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Mahatma Gandhi Hospital, Bhilwara, Rajasthan (India) and it included assessment of prevalence of dry eyes in diabetic patients. Ethical approval was obtained from institutional ethical committee before the starting of the study. A total of 250 diabetic patients, who reported to the department of ophthalmology were enrolled in the present study. Complete demographic details of all the patients were obtained. Recording visual acuity with snellen's chart followed by slit lamp biomicroscopic examination was done. Tear film break up time (TBUT) was done in all the patients by instilling a 2% fluorescein dye into the inferior conjuctival fornix and allowing blinking several times before stopping. A value less than 10 seconds was taken as abnormal. All the result was recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for assessment of level of significance.

Results

In the present study, a total of 250 diabetic patients were analyzed. Mean age of the patients of the present study was 56.88 years. 36.8 percent of the patients belonged to the age group of 51 to 60 years. 34.4 percent of the patients belonged to the age group of 61 to 70 years. Out of 250, 155 were males while the remaining 95 were females. In 48.8 percent of the patients, duration of diabetes was more than 10 years. In 27.2 percent of the patients, duration of diabetes was less than 5 years. In 60 percent of the patients, duration of diabetes was 5 to 10 years.

In the present study, among diabetic patients, prevalence of dry eyes was found to be 55.6 percent. While correlating the prevalence of dry eyes with age-wise distribution of patients, non-significant results

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were obtained. However; significant results were obtained while   correlating the prevalence of dry eyes with duration of diabetes.

Table 1: Age-wise distribution of patients

Age group (years)	n	%
40 to 50	38	15.2
51 to 60	92	36.8
61 to 70	86	34.4
More than 70	34	13.6
Total	250	100
Mean age	56.88	

Table 2: Duration of diabetes

Duration of diabetes	n	%
Less than 5 years	68	27.2
5 to 10 year	60	24
More than 10 years	122	48.8
Total	250	100

Table 3: Prevalence of dry eyes according to tear film break up time

Tear Film Break Up Time	Range/ Score	n	%
Positive	<10 seconds	139	55.6
Negative	≥10 seconds	111	44.4

Table 4: Correlation of dry eyes with age

Age group (years)	Dry eyes		p- value
	Present	Absent	
40 to 50	20	18	0.115
51 to 60	52	40	
61 to 70	46	40	
More than 70	21	13	

Table 5: Correlation of dry eyes with duration of diabetes

Duration of diabetes	Dry eyes		p- value
	Present	Absent	
Less than 5 years	30	38	0.001
5 to 10 year	35	25	(Significant)
More than 10	74	48	

Discussion

Diabetic patients with dry eye may have the same symptoms as DES without diabetes. The symptoms consist of a gritty sensation, soreness, decreased visual acuity, photophobia, itching, decreased goblet cell density and corneal sensitivity, and tearing and pain concomitant with abnormalities in TUBUT, Schirmer's test, and corneal staining. More severe cases may be complicated by corneal lesions, conjunctivitis, keratopathy, and inflammation[5,6].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. 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.[5] Dry eye disease is a frequent cause of ocular irritation for which patients seek ophthalmic care. In recent years dry eye is considered as an extremely common condition that causes varying degrees of ocular discomfort and disability[5].Hence; the present study was undertaken for assessing prevalence of dry eyes in diabetic patients.In the present study, a total of 250 diabetic patients were analyzed. Mean age of the patients of the present study was 56.88 years. 36.8 percent of the patients belonged to the age group of 51 to 60 years. 34.4 percent of the patients belonged to the age group of 61 to 70 years. Out of 250, 155 were males while the remaining 95 were females. In 48.8 percent of the patients, duration of diabetes was more than 10 years. In 27.2 percent of the patients, duration of diabetes was less than 5 years. In 60 percent of the patients, duration of diabetes was 5 to 10 years.Shah S et al determined the prevalence of dry eye in ophthalmology out-patients at a Tertiary Care Hospital and its association with various clinico-epidemiological factors. The mean age of the study population was 58.6 years. The overall prevalence of dry eye was found to be 54.3%. An association was found between dry eye prevalence and outdoor workers, participants working indoor using air conditioners, housewives, diabetics, patients who have undergone previous ocular surgery and those with meibomian gland dysfunction. Dry eye is a very common condition with a high prevalence among the elderly[8].Najafi L et al determined the diagnostic performance of tear osmolarity in diagnosis of dry eye disease by using tear lab osmolarity system in people with type 2 diabetes, and to compare it with common diagnostic tests already available in clinical practice. Two hundreds forty three people with type 2 diabetes were included. Tear osmolarity was measured with the tear osmolarity system. The 308 mOsm/L cutoff was used to diagnose dry eye disease.The prevalence of dry eye disease detected by the tear osmolarity test was 27.7%. It was as follows for the other common diagnostic tests: OSDI (17.7%), Schirmer I test (33%), TFBUT (41%), Rose Bengal (11%), and Fluorescein staining (4%). Tear osmolarity could be considered as the best single test for detection of dry eye disease in people with type2 diabetes[9].In the present study, among diabetic patients, prevalence of dry eyes was found to be 55.6 percent. While correlating the prevalence of dry

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eyes with age-wise distribution of patients, non-significant results were obtained. However; significant results were obtained while correlating the prevalence of dry eyes with duration of diabetes. Aljarousha M et al compared the dry eye symptoms and signs between diabetics and non-diabetics and tear functions between diabetic subjects with and without dry eye. 88 subjects were found to report diabetes mellitus. A group of 88, age and gender matched, control subjects were included for this comparison study. The percentage of dry eye symptoms was higher in diabetic subjects (15.9%) compared with non-diabetic subjects (13.6%; p<0.001). The percentage of dry eye symptoms was also higher in diabetics with dry eye (63%) than in diabetics without dry eye (36.9%; p<0.001). Tear break up time was significantly shorter in diabetics with dry eye compared to diabetics without dry eye.[10]Shujaat S et al determined the risk factors and treatment of dry eye disease in type 1 diabetes before any ocular surface or corneal complication occurs. Hundred confirmed cases of type 1 diabetes were included in the study by non-probability convenience sampling. Tear film breakup time and schrimer test were carried out to determine dry eye disease. Out of hundred patients, 71 (71%) were found to have dry eyes (P<0.001). The mean age of the subject in this study was 50.97 years (range 30-70 years). Old age was related to high risk of dry eye disease. There was no big difference in the incidence of dry eyes in males and females. Long duration was found to be related with increased occurrence of dry eyes (P<0.001). They recommended having periodic ophthalmic examination for type 1 diabetic patients[11].

Conclusion

From the above results, it can be concluded that significant proportion of diabetic population is affected by dry eyes, with its prevalence being directly proportional to the duration of diabetes.

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