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Assessment of prevalence of dry eyes in diabetic patients

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Abstract

Background: Diabetes Mellitus (DM) has topped the leading health related catastrophes the world ever witnessed. Various corneal components like the epithelium, endothelium, nerves and immune cells signify specific systemic complications of diabetes. Hence; the present study was undertaken for assessing the prevalence dry eyes in diabetic patients.

Materials & methods: A total of 50 type 2 diabetic patients were included in the present study. Complete demographic details of all the patients were obtained. Prevalence of dry eye syndrome was recorded. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: The overall prevalence of dry eyes among type 2 diabetic patients was 32 percent (16 patients).

Conclusion: Significant proportion of diabetic patients is affected by dry eyes during the course of the disease.

Keywords: Diabetic patients, dry eyes

Introduction

Diabetes Mellitus (DM) has topped the leading health related catastrophes the world ever witnessed. The total health burden due to DM is mainly by the severity of diabetic complications in different organs. Diabetic retinopathy (DR) affects more than 93 million people worldwide. DR is the most frequent cause of preventable blindness in middle aged population. However, recently in diabetic patients ocular surface problems, especially dry eye have been gaining attention ^[1-3].

Various corneal components like the epithelium, endothelium, nerves and immune cells signify specific systemic complications of diabetes. Just as diabetic retinopathy stands as a marker of more generalized microvascular disease, corneal neuropathy can act as a tool to predict peripheral and autonomic neuropathy, and hence gives an opportunity for early treatment ^[4, 5].

Hence; under the light of above mentioned data, the present study was undertaken for assessing the prevalence dry eyes in diabetic patients.

Materials & methods

The present study was conducted with the aim of assessing the prevalence dry eyes in diabetic patients. A total of 50 type 2 diabetic patients were included in the present study. Complete demographic details of all the patients were obtained. Criteria described previously in literature were used for diagnosing dry eye syndrome ^[6]. Blood samples were obtained from all the patients and complete haematological and biochemical profile was analysed.

Exclusion criteria

- Patients on systemic medications such as antihistamines, tricyclic antidepressants, oral contraceptives and other medications which are known to cause dry eye.
- Contact lens users
- Patients who have undergone ocular surgery (LASIK/intraocular).
- Patients having local or systemic conditions other than diabetes mellitus known to cause dry eye.
- Smokers

After meeting the exclusion criteria complete past medical history of all the patients was analysed. Prevalence of dry eye syndrome was recorded.

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All the results were 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, the overall prevalence of dry eyes among type 2 diabetic patients was 32 percent (16 patients). Majority of the diabetic patients with dry eyes belonged to the age group of more than 45 years. Majority of diabetic patients with dry eyes were males. Significantly higher prevalence of dry eyes was found to be present among subjects with duration of diabetic of more than 10 years.

Discussion

DED is initiated by damaging desiccation of ocular surface and perpetuated by a vicious circle of ocular surface inflammation. The main mechanism of DED is tear hyperosmolarity which is the hallmark of the disease. It damages the ocular surface both directly causing pain and also by inducing inflammatory signals [6, 7].

Diabetes leads to significant ocular conditions, the most important is the retinopathy changes which is said to correlate with the duration of diabetes and the control of the diabetes. Besides retinopathy, diabetes can lead to other significant effects in the eye such as refractive changes, cataracts, glaucoma, nerve palsies and dry eye. Among these dry eye is one of the commonest complications associated with diabetes. Results from the past studies show that the prevalence of dry eye in diabetics has been reported to vary between 52-54 % [8-10].

In the present study, the overall prevalence of dry eyes among type 2 diabetic patients was 32 percent (16 patients). Majority of the diabetic patients with dry eyes belonged to the age group of more than 45 years. Zou X *et al.* evaluated the prevalence and clinical characteristics of dry eye disease (DED) in community-based type 2 diabetic patients and to identify the associated factors related with DED. A total of 1360 type 2 diabetic patients in the Beixinjing community were randomly selected. All participants were given a questionnaire that assessed basic information and subjective symptoms. DED was diagnosed using the revised Japanese

DED diagnostic criteria. All subjects underwent a routine ophthalmic examination, corneal sensitivity test, tear film break-up time (BUT) test, Schirmer I test, fluorescein and lissamine green staining (FL) and fundus photography. Diabetic retinopathy (DR) was graded according to the International severity scale of diabetic retinopathy and diabetic macular edema. Of the 1360 subjects, 238 (17.5%) were diagnosed with DED. There was a significant association between the presence of DED and higher blood glucose as well as higher levels of glycosylated hemoglobin HbA1c. Corneal sensitivity was negatively correlated with the prevalence of DED. The prevalence of DED in this community-based study was 17.5%, which was lower than that observed in hospital-based studies [9].

In the present study, majority of diabetic patients with dry eyes were males. Significantly higher prevalence of dry eyes was found to be present among subjects with duration of diabetic of more than 10 years. Manaviat MR *et al.* assessed the prevalence of dry eye syndrome and diabetic retinopathy (DR) in type 2 diabetic patients and their contributing factors. 199 type 2 diabetic patients referred to Yazd Diabetes Research Center were consecutively selected. All Subjects were assessed by questionnaire about other diseases and drugs. Dry eye syndrome was assessed with Tear break up time tests and Schirmer. All the subjects underwent indirect ophthalmoscopy and retinal color photography. DR was graded according to early Treatment Diabetic Retinopathy (ETDRS) criteria. Of 199 subjects, 108 patients (54.3%) suffer from dry eye syndrome. Although dry eye syndrome was more common in older and female patients, this association was not significant. But there was significantly association between dry eye syndrome and duration of diabetes ($P = 0.01$). Dry eye syndrome was more frequent in diabetic patients with DR ($P = 0.02$). DR was found in 140 patients (70.35%), which included 34 patients (17.1%) with mild non proliferative DR (NPDR), 34 patients (17.1%) with moderate NPDR, 22 patients (11.1%) with severe NPDR and 25 patients (25.1%) with proliferative DR (PDR). There were significant relation between age, sex and duration of diabetes and DR. In this study the prevalence of dry eye syndrome was 54.3% [10].

Table 1: Prevalence of dry eye syndrome

Parameter	Number of patients	Prevalence
Dry eyes	32	16

Table 2: Risk factors for occurrence of dry eye syndrome

Parameter		Number of patients	P- value
Age group (years)	Less than 45	13	0.010 (Significant)
	More than 45	19	
Gender	Males	20	0.000 (Significant)
	Females	12	
Duration of diabetes (years)	Less than 10	10	0.002 (Significant)
	More than 10	22	

Conclusion

From the above results, the authors concluded that significant proportion of diabetic patients is affected by dry eyes during the course of the disease.

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