

Original Research

Evaluation of clinical profiles of dry eyes in diabetic patients

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ABSTRACT:

Background: 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. The present study was conducted for assessing the clinical profiles of dry eyes in diabetic patients. **Materials & methods:** 200 type II Diabetes Mellitus patients were enrolled. Patient data was collected according to the proforma. Medical history and history of extra ocular surgery and contact lens use was noted. The presence of any systemic disease, history of ocular surgeries, trauma or contact lens use and ocular medications was noted. Incidence and profile of dry eyes in diabetic patients was assessed. The data were collected from patients using a case report form. **Results:** The overall prevalence of dry eyes was found to be 50.5 percent of the type-2 diabetic patients. Mean age of the diabetic patients with dry eyes was 56.8 years. Out of 101 patients with dry eyes, 42 were males while the remaining were 59 were females. Gritty feeling was seen in 51 patients while burning sensation was seen in 96 patients. Redness was seen in 38 patients while itching and ocular pain was seen in 84 patients and 65 patients respectively. **Conclusion:** Clinical evaluation of dry eye should be an integral part of ocular examination in diabetic patients.

Key words: Diabetic, Dry eyes

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INTRODUCTION

Diabetes mellitus is taken from the Greek word diabetes, meaning siphon - to pass through and the Latin word mellitus meaning sweet. A review of the history shows that the term "diabetes" was first used by Apollonius of Memphis around 250 to 300 BC. Ancient Greek, Indian, and Egyptian civilizations discovered the sweet nature of urine in this condition, and hence the propagation of the word Diabetes Mellitus came into being. Over the years, exceptional work has taken place, and multiple discoveries, as well as management strategies, have been created to tackle this growing problem. Unfortunately, even today, diabetes is one of the most common chronic diseases in the country and worldwide.¹⁻³

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. This review aims to discuss the prevalence, etiology, and treatment strategies of diabetes mellitus associated DES and to emphasize the importance of early diagnosis and interventions in diabetes-associated DES. Diabetes mellitus (DM) has been identified as one of the leading systemic risk factors for DES. The reported prevalence of DES in diabetics is 15–33% in those over 65 years of age and increases with age and is 50% more common in women than in men. The incidence of dry eye is correlated with the level of glycated hemoglobin: the higher the level of glycated hemoglobin, the higher the incidence of dry eye.⁴⁻⁷ Hence; the present study was planned for evaluating the clinical profiles of dry eyes in diabetic patients.

MATERIALS & METHODS

200 type II Diabetes Mellitus patients were enrolled. 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. Incidence and profile of dry eyes in diabetic patients was assessed. The data were collected from patients using a case report form. All the results were analysed by SPSS Software and were subjected to statistical analysis.

RESULTS

All the diabetic patients had mean age of 51.8 years. Majority proportion of the patients were males. In approximately forty percent of the patients, the duration of diabetes was up to 5 years. The overall prevalence of dry eyes was found to be 50.5 percent of the type-2 diabetic patients. Mean age of the diabetic patients with dry eyes was 56.8 years. Out of 101 patients with dry eyes, 42 were males while the remaining were 59 were females. Gritty feeling was seen in 51 patients while burning sensation was seen in 96 patients. Redness was seen in 38 patients while itching and ocular pain was seen in 84 patients and 65 patients respectively.

Table 1: Overall Prevalence of dry eyes

Dry eyes	Number of patients	Percentage of patients
Absent	99	49.5
Present	101	50.5

Table 2: Profile of patients with dry eyes

Profile	Number
Mean age	56.8
Males (n)	42
Females (n)	59

Table 3: Association of dry eyes with ocular manifestations

Ocular manifestation	Patients with dry eyes
Gritty feeling	51
Burning sensation	96
Stickiness	46
Redness	38
Itching	84
Ocular pain	65

DISCUSSION

The eyes are affected in Diabetes Mellitus (DM) and diabetic retinopathy is one of the most feared complications of this disease. Dry eyes may also occur in these patients and it contributes to loss of quality of life; they cause blurred vision, photophobia and pruritus favoring the appearance of corneal ulcers. Human tears are formed by mucin elaborated by the goblet cells and by an aqueous component, produced by the lacrimal glands. The mucin layer helps to reduce friction and protects the cornea

during blinking; the aqueous component contains enzymes, vitamins, electrolytes, antibodies, etc. and are important for lubrication and local defense. Externally to them there is a hydrophobic lipid layer that avoids tear evaporation and that is produced by the eyelid sebaceous glands. An eye may become dry either for inadequate tear production or by excessive tear evaporation. The former is usually secondary to lacrimal gland dysfunction while the second is seen more commonly with Meibomian gland malfunctioning or with blepharitis. Reducing the tear production results in tear-film hyperosmolarity and local inflammation.⁵⁻⁷

Dry eyes, also known as keratoconjunctivitis sicca, are commonly seen in normal population affecting from 5% to 34% of the population around the world and may be triggered by environmental factors associated with low-humidity ambient, use of contact lenses, excessive use of computers, etc. Some authors state that they are more common in DM than controls although the reasons for this finding are not completely clear.⁷⁻¹⁰ Hence; the present study was planned for evaluating the clinical profiles of dry eyes in diabetic patients.

All the diabetic patients had mean age of 51.8 years. Majority proportion of the patients were males. In approximately forty percent of the patients, the duration of diabetes was up to 5 years. The overall prevalence of dry eyes was found to be 50.5 percent of the type-2 diabetic patients. Mean age of the diabetic patients with dry eyes was 56.8 years. 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. 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 following tests were also performed: Ocular Surface Disease Index (OSDI) questionnaire, Tear Film Break up Time (TFBUT), Schirmer I test, Rose Bengal and Fluorescein staining. The results of these tests were compared to the tear osmolarity measurement. 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%). Fluorescein staining had the highest specificity (97%). With the cutoff score >12, the positive likelihood ratio for the OSDI questionnaire was the highest (1.78). The sensitivity was poor for all common diagnostic tests. ROC curve analysis could not determine optimal cut offs for the common diagnostic tests. The available common diagnostic tests underestimate the presence of dry eye disease in people with type 2 diabetes.¹¹

Out of 101 patients with dry eyes, 42 were males while the remaining were 59 were females. Gritty feeling was seen in 51 patients while burning

sensation was seen in 96 patients. Redness was seen in 38 patients while itching and ocular pain was seen in 84 patients and 65 patients respectively. 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 ($P < 0.001$, OR 1.240) as well as higher levels of glycosylated hemoglobin HbA1c ($P < 0.001$, OR 1.108). Corneal sensitivity was negatively correlated with the prevalence of DED ($P = 0.02$, OR 0.973). The prevalence of DED in this community-based study was 17.5%, which was lower than that observed in hospital-based studies.¹²

CONCLUSION

Clinical evaluation of dry eye should be an integral part of ocular examination in diabetic patients.

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