Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 85.10

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Evaluation of prevalence of dry eyes in diabetic patients

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ABSTRACT:

Background and Aim: 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. The present study was undertaken for assessing the prevalence dry eyes in diabetic patients. **Material and Methods:** The present study was conducted with the aim of assessing the prevalence dry eyes in diabetic patients. A total of 70 type 2 diabetic patients were included in the present study. Blood samples were obtained from all the patients and complete haematological and biochemical profile was analysed. After meeting the exclusion criteria complete past medical history of all the patients was analysed. Prevalence of dry eye syndrome was recorded. **Results:** 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. **Conclusion:** Significant proportion of diabetic patients is affected by dry eyes during the course of the disease.

Key Words: Cataract, Diabetes, Dry eyes, Prevalence

Received: 28 April, 2021 Accepted: 29 May, 2021

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This article may be cited as: Guglani S, Gajjar P, Patoria V. Evaluation of prevalence of dry eyes in diabetic patients. J Adv Med Dent Scie Res 2021;9(6):32-35.

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] 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.[4] These patients suffer from a variety of corneal complications including superficial punctuate keratopathytrophic ulceration, and persistent epithelial defect.[5] 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.[6,7] The mechanism responsible for dry eyes is unclear[8], but autonomic dysfunction may be responsible.[9] Aldose reductase, the first enzyme of the sorbitol pathway, may also be involved. The oral administration of aldose reducetase inhibitors has been shown to improve the tear dynamics significantly.[10]

Damage to the microvasculature of the lacrimal gland accompanied by autonomic neuropathy might impair lacrimation in persons who suffer from diabetes for a long time. Patients with diabetic retinopathy do not complain of symptoms of dry eye, but they have pathological and clinical signs of Keratoconjunctivitis Sicca.[11]

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.[11,12] Hence; under the light of above mentioned data, the present study was undertaken for assessing the prevalence dry eyes in diabetic patients.

MATERIAL AND METHODS

The present study was conducted with the aim of assessing the prevalence dry eyes in diabetic patients. A total of 70 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.[13] Blood samples were obtained from all the patients and complete haematological and biochemical profile was analysed.

Exclusion criteria included cigarette smoking, contact lens, Lasic surgery, allergies, Sjogren's syndrome, rheumatoid arthritis, Parkinson, lupus, some medications such as antihistamines, tricyclic antidepressants, oral contraceptives, and drugs used to treat high blood pressure and diuretics. Moreover vitamin A deficiency and pregnancy were excluded. After meeting the exclusion criteria complete past medical history of all the patients was analysed. Prevalence of dry eye syndrome was recorded.

STATISTICAL ANALYSIS

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

RESULTS

Overall prevalence of dry eyes among type 2 diabetic patients was 32.8% percent (23 patients). (Table 1) 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. (Table 2)

Table 1: Prevalence of dry eye syndrome

Variable	Number of patients	Prevalence (%)
Dry eyes	23	32.8

Table 2: Risk factors for occurrence of dry eye syndrome

Variables		No of patients	P value
Age group	Less than 45	10	0.01*
	More than 45	13	
Gender	Male	14	0.002*
	Female	9	
Duration of diabetes (years)	Less than 10	8	0.001*
	More than 10	15	

*** indicates statistically significance at p≤0.05**

DISCUSSION

Dry eye syndrome is common among patients with DM, with tear film stability and TBUT being decreased. The mucin layer of the tear film is necessary for tear film spreading and wetting. 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.[13,14] 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 % [15-17]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. Some studies evaluated dry eye syndrome in diabetic patients. In a cohort study on 3722 subjects were aged 48 to 91 years (65 ± 10 years) and 43% male. The overall prevalence of dry eye was 14.4%. Prevalence varied from 8.4% in subjects younger than 60 years to 19.0% in those older than 80 years. Age-adjusted prevalence in men was 11.4% compared with 16.7% in women.[18] In another study a group of 140 patients aged 24–93, suffering from dry eye syndrome were assessed. A larger number of dry eye syndrome cases were identified in female patients, especially aged over 50 (80% of female and 20% of male). 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. 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% .[19]

An Indian study investigated the changes in tear film and ocular surface in diabetic patients. Corneal sensitivity, tear film break up time, Rose Bengal test, and Schirmer's test without and with topical anesthesia were measured. Results showed that corneal sensitivity, TBUT, total and basal tear secretions were significantly lower in the diabetic group compared with the control group. This indicates that in patients with type II diabetes there is an ocular surface disorder.[20]

Prevalence of dry eye in our study is very high. It might be due to aging, dry weather in this region and high prevalence of neurological disorder in type 2 diabetic patients. Lack of control group and glycemic parameters assessment especially HbA1C could be mentioned as limitation of our study.

CONCLUSION

Diabetes can lead to ocular surface impairments with qualitative and quantitative tear disorders. These abnormalities, even if not currently mentioned by diabetic patients, can result in severe complications. Significant proportion of diabetic patients is affected by dry eyes during the course of the disease.

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