



SCREENING FOR DRY EYE IN TYPE II DIABETIC PATIENTS IN A TERTIARY EYE CARE HOSPITAL

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ABSTRACT

AIM: To screen for dry eye among type 2 diabetic patients, determine the prevalence and correlate with blood sugar levels.

METHODS: 100 patients who were diagnosed cases of type 2 diabetes were included in the study. Detailed history regarding ocular symptoms, diabetes and its duration was taken. A thorough ocular examination using Slit lamp bio microscopy was done and visual acuity tested with Snellen's chart. Tear film status evaluated by Schirmer's I test, Tear film break up time (TBUT), Tear meniscus height. Two or all of the above performed tests was positive in a given patient, the patient was deemed to be suffering from dry eye.

RESULTS: Out of 100 patients, males were 48 and females were 52. 39 patients were found to show positive screening tests for dry eye. 38% (out of 39 patients) had major symptom of foreign body sensation. 23 out of 39 patients were females. 14 out of 39 patients were in age group 51 to 60 years. Most of the diabetics with dry eye had duration of disease 5 to 10 years. 39 patients had Tear Break Up time <10 sec, 25 patients had Tear Meniscus Height <0.25mm and 36 patients had Schirmer's I test <10mm. Diabetics with dry eyes had average RBS of 179.63+57.28 and PPBS of 247.75+88.39 mg/dl. These values were more when compared to diabetics with no dry eye.

CONCLUSION: Early ocular examination in Diabetic patients and good glycemic control should be done considering increased incidence of dry eyes. This should be an integral part of the assessment of diabetic eye disease so as to improve the patient's comfort and to prevent or minimize further structural damage to the ocular surface.

KEYWORDS : Diabetes Mellitus (DM); Tears; Schirmer's test

INTRODUCTION

Diabetes is one of the leading health related catastrophes the world has ever witnessed. WHO has labelled India as "The diabetic capital of the world"¹

Diabetes is often associated with several ocular conditions mainly diabetic retinopathy, cataracts, refractive errors, nerve palsies and orbital infections. However, one of the most common, but often neglected complications associated with diabetes is dry eye²

Diabetes mellitus has been diagnosed as a risk factor for dry eye in several studies including large population studies. It has been suggested that the association maybe due to diabetic sensory or autonomic neuropathy or due to the occurrence of microvascular changes in lacrimal gland³

The four core inter-related mechanism responsible for dry eye are tear instability, tear hyper osmolarity, inflammation and ocular surface damage. It is associated with symptoms such as stinging, foreign body sensation, watering, redness and may cause serious irritation to the interpalpebral ocular surface particularly the cornea⁴

Close monitoring of diabetic patients as well as glycaemic control is important for the prevention of dry eye syndrome. Early diagnosis of dry eye syndrome in diabetic patients is important for improving the ocular surface and quality of vision⁵

Hence the present study was undertaken to evaluate the tear production, the stability of the tear film in diabetic individuals in order to detect possible tear film abnormalities.

AIM OF THE STUDY

To screen for dry eye among type 2 diabetic patients attending Govt Regional Eye Hospital, Andhra medical college, Visakhapatnam.

MATERIALS AND METHODS

This is a cross-sectional study conducted in department of ophthalmology in GREH, Andhra medical college, Visakhapatnam over a 3 months period from August 2020 to October 2020. 100 Type II diabetic patients were assessed for the presence of dry eyes.

INCLUSION CRITERIA:

All patients of either sex, in all age groups, diagnosed to have Diabetes Mellitus Type II of any duration

EXCLUSION CRITERIA:

1. Patients with systemic diseases and local ocular disease/surface abnormalities other than diabetes mellitus
2. chronic contact lens wearer.
3. ocular surgeries in the past.
4. Patients on local or systemic medications

METHODOLOGY:

Detailed history is taken including name, age, sex, occupation and presenting symptoms Regarding diabetes: type, duration of disease, recent FBS, PPBS values, and compliance to medication was asked. A thorough ocular examination using Slit lamp biomicroscopy was done and visual acuity tested with Snellen's chart.

Tear film status evaluated by

- Schirmer's I test
- Tear film break up time (TBUT)
- Tear meniscus height

Tear meniscus height <0.25 mm was considered positive for dry eye. Schirmer's test I (What-man's filter paper No.41)-wetting <10 mm in 5 min was taken as positive for dry eye.

TBUT <10 seconds was taken as positive for dry eye.

Two or all of the above performed tests was positive in a given patient, the patient was deemed to be suffering from dry eye.

RESULTS

Out of 100 Type II Diabetics patients : Males-48 , Females- 52 39 were found to show positive screening tests for dry eye

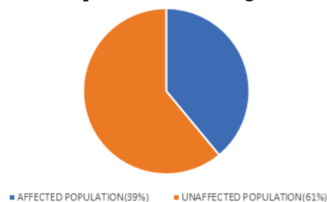


Figure 1: Pie Diagram Showing Affected Population

Table 1: Table Showing Presenting Complaints Among The Dry Eye Patients

| SYMPTOMS | TOTAL NO. | %out of 39 patients |
|----------------------------|-----------|---------------------|
| Foreign Body | 15 | 38% |
| Dryness feeling | 5 | 12.8% |
| Burning | 7 | 17.9% |
| Itching | 8 | 20.51% |
| Episodes of blurred vision | 2 | 5.12% |
| Redness of eye | 2 | 5.12% |

Table2: Age And Sex Distribution Among 100 Patients

| Sex | Count | Dry eyes | %out of 39 patients |
|------------|--------|----------|---------------------|
| Male | 48 | 16 | 33% |
| | Female | 23 | 44% |
| Age in yrs | <20 | 0 | - |
| | 21-30 | 0 | - |
| | 31-40 | 5 | 12.8% |
| | 41-50 | 10 | 25.6% |
| | 51-60 | 33 | 35.8% |
| 60-70 | 22 | 10 | 25.6% |

Table 3: Dry Eye Association With Duration Of Diabetes

| Duration of Diabetes | Count | Dry eyes | %out of 39 patients |
|----------------------|-------|----------|---------------------|
| <6 months | 13 | 5 | 12.8% |
| 6-12 months | 6 | 2 | 5.1% |
| 1-5 years | 17 | 6 | 15.3% |
| 5-10 years | 37 | 19 | 48.7% |
| 10-20 years | 21 | 6 | 15.37% |
| >20 years | 6 | 1 | 2.5% |

Most of the diabetics with Dry eye had duration of disease 5 to 10 years (48.7%)

Table 4: Table Showing Tear Film Findings Among The Patients

| Test | Affected no. | %out of affected 39 patients |
|------------------------------|--------------|------------------------------|
| Tear Break Up time <10 sec | 39 | 100% |
| Tear Meniscus Height <0.25mm | 25 | 64% |
| Scrimers I test(<10mm) | 36 | 92% |

Table 5: Table Showing Relation Of Fbs And Ppbs Values In Dry Eye Patients

| Glycemic control | No dry eyes | Dry eyes |
|------------------|--------------|--------------|
| FBS in mg/dl | 83.90±12.294 | 179.63±57.28 |
| PPBS in mg/dl | 116.15±10.49 | 247.75±88.39 |

FBS and PPBS levels were found to be more in diabetic patients with dry eye.

DISCUSSION

Past studies suggest that Dry eye prevalence in TYPEII diabetics ranges from 14.5% to 54.3%. In our study, out of the

100 patients who participated, 39% were suffering from dry eye.

Table 6 :table Showing Prevalence Of Dry Eye Intype 2 Diabetics In Other Studies

| STUDIES | PREVALENCE OF DRY EYE IN TYPE 2 DIABETICS |
|---------------------------------------|---|
| Zou et al ⁶ | 17.5% |
| Paulsen et al ⁷ | 14.5% |
| Sahai et al ⁸ | 18.4% |
| Manaviat et al ⁹ | 54.3% |
| Anuj Kumar Singal et al ¹⁰ | 43% |
| Present study | 39% |

The prevalence of dry eyes has been seen to affect females more than males. In Paulsen et al study (dry eye in beaver dam offspring study)showed a 17.9% incidence of dry eyes in diabetic women compared to 10.5% in diabetic men⁷. In present study, dry eye was more in females (44%) compared to males (33%).

Diabetic patients develop dry eyes moreoften than non-diabetic subjects. Fox et al has proposed that a possible explanation could be an exocrine dysfunction of the mainlacrima gland in patients with DM¹¹.Development of additionalunknown proteins in the tear fluids or a microvascular damageof lacrimal gland along with autonomic neuropathy leading to impaired function of the lacrimal gland are some other postulatedhypothesis¹²

In our present study, increase in age is associated with dry eyes with 14 dry eye patients in the age group of 51-70 years and 19 patients had diabetes duration between 5 to 10 years. Kaisermann et al reported that good blood sugar regulation is important for prevention and control of dry eye among diabetics¹³

In our study, elevated FBS and PPBS were found to be associated with dry eyes in the study, indicating the role of hyperglycemia. Recent data suggested that patients with poor diabetic control and hyperglycemia have corneal nerve fiber damage and reduced corneal sensitivity According to the International Dry Eye WorkShop (DEWS), the reduced corneal sensitivity favors the occurrence of DES in two ways: first by decreasing the reflex-induced lacrimal secretion and second by reducing the blink rate and increasing evaporative tear loss¹⁴

CONCLUSION

1. Considering increased incidence of dry eyes, early ocular examination in Diabetic patients should be done for early detection of the ocular surface disorders.
2. In order to prevent dry eye syndrome, good glycemic control is important.
3. Examination of dry eyes should be an integral part of the assessment of diabetic eye disease so as to improve the patient's comfort and to prevent or minimize further structural damage to the ocular surface.
4. Early dry eye diagnosis also contributes towards preventing a very distressful and prolonged period of epithelial non-healing following trauma, infections and in post-operative period of patients who undergo cataract surgery orrefractive surgeries.

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