

Tear Film Breakup Time in Diabetic Patients

Sir,

Keratoconjunctivitis sicca commonly called 'dry eye' has many causative factors; and diabetes is identified as one of the etiology of dry eye syndrome worldwide. Diabetes is one of the leading causes of ocular morbidity and blindness in 20-74 years of age.¹ As it affects not only the anterior, posterior segment of the eye and lens, but also the retina leading to retinopathy. According to WHO, the prevalence of diabetes in Pakistan 2016 is 9.8%. The reported prevalence of dry eye syndrome is 15-33% in those of over 65 years of age.²

Tear film has three layers: an oily (lipid) layer, a watery (aqueous) layer and a mucin layer. The main function of these three layers is to help maintain the health of our eyes and ward off infection. Tear breakup time (TBUT) is an objective test, which is done to diagnose dry eye disease. Fluorescein staining had the highest specificity (97%).³ A tear breakup time under 10 seconds is considered abnormal. Various former research trials have established the association between diabetes and dry eye disease.

This study, which was a hospital based cross-sectional study, enrolled 120 patients from OPD of Holy Family Hospital from 1st November till 31st December 2017. Patients with diagnosed Diabetes were selected. All other causes of dry eye like autoimmune disease, vitamin A deficiency, medication e.g. antihistamine, antidepressants, hormonal therapy, laser surgery, post-menopausal females and smoking were also excluded. Tear breakup time (TBUT) test was then performed to assess for dry eye disease with value of less than 10 seconds indicated diseased. Sixty two out of 120 (51.7%) patients had TBUT less than 10 seconds ($p = 0.04$) with 56.5% ($n=34$) males and 43.5% ($n=26$) females affected; however, the gender distribution was equivalent constituting 60 each in sample. In contrast, a study in Brazil showed female predominance (75.9%) as opposed to this study. Sixteen (13.3%) patients were aged between 20-40 years, 64.2% ($n=77$) were from 41-60 years, 21.7% ($n=27$) were from 61-80 years, and 0.8% ($n=1$) greater than 80 years showing the peak frequency at 41-60 years of age. Patients with Type 1 diabetes had greater frequency (70%) ($n=84$) to develop dry eye syndrome. Forty-three (35.8%) patients were suffering from diabetes for 1-5 years, 28.3% ($n=34$) for 6-10 years, and 35.8% ($n=43$) for more than 10 years showing that the disease had a bimodal distribution, appearing either in first five years or after 10 years of diabetes.

Hence, this study showed that diabetes is a causative agent of dry eye syndrome, but gender distribution is still debatable, for which more research work should be done to negotiate this fact. None of the studies done previously, demonstrated the bimodal distribution of dry eye syndrome with duration of diabetes, which is unique in this study. Further clinical trials should be performed to clarify

this fact. Moreover, research programmes should be carried out for symptoms of diabetes associated dry eye syndrome, its association with glycated hemoglobin HgA1c, its correlation with diabetic retinopathy and effect on its incidence with prevention measures of diabetes. Limitations in diagnostic approach for dry eye syndrome in diabetes are mainly due to lack of objective tests with sufficient sensitivity and specificity that could be applied easily in routine clinical care settings; and at the same time be adequately reproducible.^{4,5} The therapeutic strategies of dry eye syndrome include artificial tears and lubrication, strict diabetic control, and behavioural modifications.

CONFLICT OF INTEREST:

No conflict of interest is present in this study.

AUTHORS' CONTRIBUTION:

SZ: Conception, design, data acquisition and analysis, drafting and critical revision.

ES: Data analysis and interpretation, critical revision and final approval.

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