

Comparison of Dry Eye Syndrome in North West Pakistani Diabetics and Non-Diabetics Population

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Abstract

OBJECTIVES: To compare Dry Eye Syndrome in Northwest Pakistani Diabetics and Non-Diabetics.

Study Design: Case Control Study

Setting: Department of Ophthalmology at Hayatabad Medical Complex, Peshawar

Material and methods: this study is conducted on 50 cases and 50 controls at eye OPD from 5th October, 2018 to 5th December 2018 by Convenience sampling technique. After that patient ocular and systemic history were taken and checked previous clinical records if present. Anterior segment examination was carried out with a slit lamp. Fluorescein staining and schirmer test was carried out for diagnosing the dry eye syndrome. Patients were classified as having clinically dry eyes if their tear film was less than 10 mm, and as very dry if it was less than 5 mm. To assess the staining, fluorescein stain was utilized as a diagnostic dye. Dry eyes were regarded as having more than three fluorescein-stained cells. Chi-Square analysis, EPI Info 16, and SPSS were used to examine the data.

RESULTS: In this research study, there were 50 cases of diabetes and 50 controls (control), were analyzed to look into the relationship between Dry Eye Syndrome with Diabetes mellitus. Dry Eye syndrome was present in 12 (24%) patients, 05 (33.3%) were males and 07 (66.6%) were females. Dry Eye Syndrome was present in 26(52%) patients, 12 (36.6%) were males and 14 (63.6%) were females. Odd ratio for case and control was calculated by applying Chi-Square test which was 7.90 at 95% of confidence level (CI) with a P value of 0.004943 assuming a P value of <0.05 level of significance.

CONCLUSION: Dry eyes and diabetes seem to go together frequently. Type I diabetes is more likely to cause a milder degree of dry eye, but type 2 diabetes is more likely to cause mild to moderate dry eye.

Keywords: dry eye syndromes, tear film, diabetes

Cite this article: Khan J, Rehman U.R, Idris M, Khan N, Masood Z.M,. Comparison of Dry Eye Syndrome in Northwest Pakistani Diabetics and Non-Diabetics Population. BMC J Med Sci. 2023. 4(2): 55-59

Introduction

Different degrees of discomfort and impairment are caused by the common ailment known as dry eye syndrome. As people get older, dry eye conditions is more common. A considerable segment of the population, particularly those over 50, is affected by the prevalent eye condition DES.¹ Middle-aged and older persons are among the groups most frequently afflicted

by refractive surgery, drug action side effects, excessive contact lens use, and autoimmune illnesses.² Due to rising life expectancy and anticipated older population expansion, the impact of DES will keep growing. 14.6% of the 2520 seniors (65 and older) in a population-based survey in Salisbury reported having persistent or regular dry eye symptoms.³ In Melbourne, Australia, a community dry eye study indicated that

Authorship Contribution: ¹⁻⁵Substantial contributions to the conception or design of the work; or the acquisition, data analysis, drafting the work or revising it critically for important intellectual content, Final approval of the version to be published & supervision

Funding Source: none

Conflict of Interest: none

Received: August 16, 2023

Accepted: December 15, 2023

Published: December 20, 2023

much more than half of the 926 subjects, aged 40 to 97, showed lower Schirmer test and higher rose Bengal levels. 4 Males' Health research shows that when males 50 to 54 were compared to those over 80, the prevalence of dry eye illness jumped from 3.90% to 7.67% in men. 23 In a related Women's Health research involving more than 39,000 those, the prevalence of dry eyes ranged between 5.7% in women under the age of Fifty to 9.8% in those over the age of 75. 5 100 persons with dry eye illness were surveyed. It was shown that the average duration of symptoms was 48 months (mean 86.8 months, SD 103.9 months).75.8% of patients said their dry eye had gotten worse over time. More than 15% of people over 65 and as many as 6% of people over 40 in the US suffer from dry eye, respectively. 6 A local study In India found that roughly 32% of people had some dry eye problems. 7

Around the world, the occurrence of DES varies between 5% and >30% in different age groups. 8 Between 25 and 30 million people worldwide are thought to be afflicted by DES. According to research, DES can strike people of any color and is more prevalent among women than men. 9 Up to 20% of rheumatoid arthritis patients have KCS. Computer users, including long-term contact lens wearers, are among the extra 31 persons who may be affected, in addition to those who have Helicobacter pylori. 10

Between 20% and 30% of those with diabetes experience a much greater prevalence of dry mouth. According to Seifart et al., this is brought on by a depletion of conjunctival goblet cells, decreased corneal sensitivity, and lacrimal gland-related neuropathy. According to Moss et al., diabetic women had a higher occurrence of dry eyes (16.7% against 11.4% in men). 11. A sample of 140 patients with a dry eye condition, ranging in age from 24-93, was evaluated in a different study. Eighty percent of female and twenty percent of male patients with dry eye conditions were female patients, especially those over 50. Diabetes and arterial hypertension were the two most common general medical problems diagnosed in the sample of participants (women). 12 According to one study, 55% of diabetes patients experienced signs and symptoms of dry eyes at least occasionally. 13

Early investigations have indicated that the most frequent symptoms of diabetic retinopathy, or DR, are connected to problems with the ocular surface in the general and dry eye. DR is frequently considered to be the primary ocular condition associated with diabetes. 14

The Beaver Dam Eye Analysis revealed that from the ages of 43 and 86, 20% of type 2 diabetes had dry eyes. 15

52.9% of individuals with diabetes or borderline diabetes, according to research by Hom and De Land, self-reported having clinically significant dry eyes. 16

This study aimed to investigate the prevalence of dry eye syndrome among people aged 50 years or older with and without diabetes. To protect diabetic patients from the sequelae of dry eye syndrome, such as corneal problems, including superficial punctate keratopathy, corneal ulceration, or persistent epithelial defects, this study will determine the association between dry eye syndrome and diabetes mellitus.

Material and Method

This is a Case-Control Study Design conducted in the Department of Ophthalmology at Hayatabad Medical Complex, Peshawar, on 50 cases and 50 controls at eye OPD Hayatabad Medical Complex from 5th October 2018 to 5th December 2018 by Convenience sampling technique. Inform consent was taken from each patient, and the data collected and kept confidential and used for research purposes only. The Cases included diabetic patients of age 40 and above, while the Controls were non-diabetic patients of age 40 and above. Exclusion criteria include Patients having a history of systemic medications, such as antihistamines, antidepressants, beta-blockers, and oral contraceptives, etc. which can induce dry eye syndrome, Patients with thyroid disease, rheumatoid arthritis, systemic lupus, etc. and Patients not willing to participate. Material and instruments include Fluorescein strips, Filter Paper, Ophthalmoscope, Slit Lamp, Stopwatch, and Shirmir' strips. The ocular examination of each person started from VA assessment through Snellen acuity chart at 6 m. After that patient's ocular and systemic history was taken and check previous clinical records if present. The anterior segment examination was carried out with a slit lamp. The tear film break-up time test, Fluorescein staining, and Schirmer test were carried out to diagnose dry eye syndrome. The general characteristics of dry eye illness can be found using the following categories of diagnostic tests. 17: Questionnaires for symptoms, staining to detect damage to the ocular surface, Tear break up a time to determine how unstable a tear is, and Osmometry for hyperosmolarity of tears.

The Fluorescein tear break-up time test (TBUT), which measures the time in seconds between a full blink and the first dry spot or discontinuity emerging in the precorneal tear film, was used to evaluate the stability of the tear film. Patients were categorized as having clinical dry eyes if their TBUT was less than 3 seconds. Schirmer and filter paper strips were applied to the lower lid's tarsal conjunctiva region for the Schirmer test. The tear strip was then appraised based on how much it dries in five minutes after the patient was permitted to blink normally. Patients were classified as having clinically dry eyes if their tear film was less than 10 mm, and as very dry if it was less than 5 mm. To assess the staining, fluorescein stain was utilized as a diagnostic dye. Dry eyes were regarded as having more than three fluorescein-stained cells. Chi-Square analysis, EPI Info¹⁶, and SPSS were used to examine the data.

Results

In this research study, there were 50 cases of diabetes, and 50 controls (control) were analyzed to look into the relationship between Dry Eye Syndrome with Diabetes mellitus. The gender distribution of cases and control are shown in Table 1.

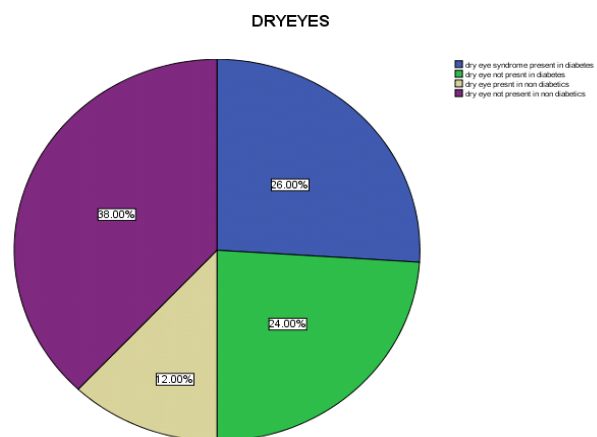
Gender	Frequency	Percent
Male	53	53.0
Female	47	47.0
Total	100	100.0

Dry Eye syndrome was present in 12 (24%) patients, 05 (33.3%) were males, and 07 (66.6%) were females. Aqueous tear deficiency was present in 06(66.6%) patients, 02 (33.3%) were males, and 04 (66.6%) were females. Evaporative type of Dry Eye Syndrome was present in 03 (44.4%) patients, 01 (33.3%) were male, and 02(66.6%) were females. In the case group, there were 24 (48%) males and 26 (52%) females, with a mean age of years and duration of DM in years. Dry Eye Syndrome was present in 26(52%) patients, 12 (36.6%) were males, and 14 (63.6%) were females. Aqueous tear deficiency was present in 17(77.2%) patients, 06 (35.2%) were males, and 11 (64.8%) were females. Evaporative type of dry eye syndrome was present in 05 (22.7%) patients, 02 (40%) were males, and 03(60%) were females (Graph 1). The age distribution is shown in graph 2—frequency dry eyes with mean 2.36 +_0.871 standard deviation as shown in graph 3. The odd ratio

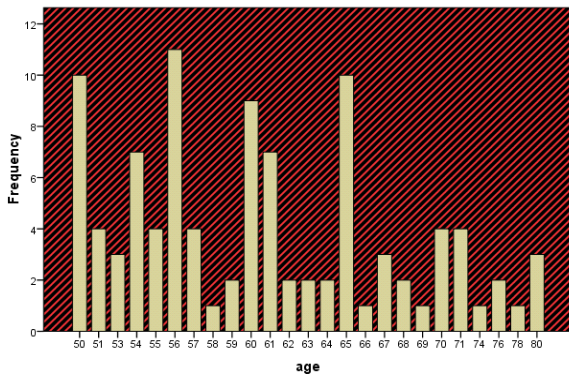
for case and control was calculated by applying the Chi-Square test, which was 7.90 at a 95% of confidence level (CI) with a P value of 0.004943, assuming a P value of <0.05 level of significance.

Discussion

Among the most prevalent conditions that prompt patients to see an eye doctor is a dry eye. Owing to changes in people's lifestyles and environments, there has been an enormous rise in the number of patients who present with dry eye. Recent developments in Dry Eyes treatment have been made possible by the revolution in better diagnostic tools. However, earlier identification of the prevailing disease will be aided by a greater understanding of the issue and the presence of pertinent signs and symptoms, including those related to external and systemic variables, and supported by the best set of tests for dry eye. The significant disconnect between patients' subjective complaints and the clinical studies available to diagnose dry eye is an issue that every physician is aware of. Clinical trials frequently show no correlation between the outcomes of Schirmer's testing, Tear Film Break up Time, Rose Bengal staining, and Fluorescein staining. According to a study 18, both subjective evaluations and objective diagnostic procedures are helpful in the clinical diagnosis of abnormalities of the tear film. Ocular surface disease and aqueous tear disease are connected.

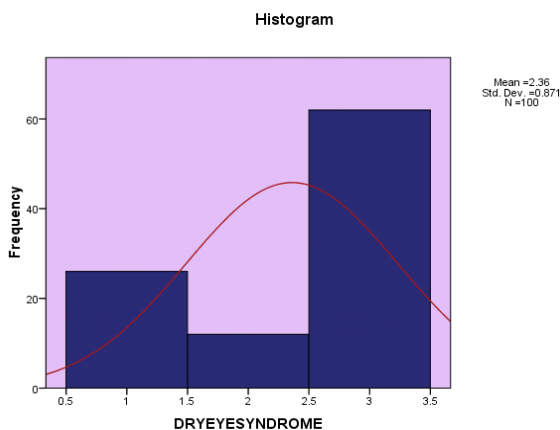


Graph 1. Frequency of dry eyes among cases and controls



Graph 2. age distribution

Each type of dry eye, whether tear deficient or evaporative, shares several global characteristics, such as a specific set of symptoms, ocular surface destruction, decreased tear film integrity, and hyperosmolarity of the tears. Inflammation has increasingly been identified as a factor in the illness process, contributing to symptoms and disease. The most significant component of the illness for the patient is the symptoms. However, additionally, ocular surface damage and tear film instability must be found to diagnose dry eyes. The tear film appears unstable in all forms of dry eye illness, and tear hyperosmolarity is primarily responsible for ocular surface damage.



Graph 3. Frequency of dry eyes with mean and standard deviation.

Although the bulk of dry eye cases involve these criteria, doctors occasionally see patients who exhibit symptoms of the condition and slight ocular surface injury or evidence of surface abnormalities despite the absence of nearly any symptoms. In this study, dry eye was diagnosed using symptoms, surface fluorescein staining, screening techniques, including tear break-up time, and Schirmer's test, which indicated total and basal secretion.

Surprisingly detailed research showed that individuals exhibited aberrant tear break-up time or Schirmer readings rather than symptoms or evidence of ocular surface injury. These patients were eventually enrolled for the diagnosis of dry eyes because symptoms frequently do not correspond with signs and because evidence of ocular surface defects can develop later in the course of dry eyes, leading to the clinical misidentification of the milder disease known.

The prevalence of Dry eye ranges from 18.1% to 70%, demonstrating a significant variance. The lack of standardization in the patient types chosen for the study, the dry eye questionnaires, the objective tests, and the dry eye clinical definition is to blame for the variance. Between 20% and 30% of those with diabetes experience dry mouth. This is a much greater prevalence. According to study¹⁹, this is brought on by a loss of conjunctival goblet cells, a reduction in corneal sensitivity, and lacrimal gland neuropathy. According to another study²⁰, diabetic women had a higher incidence of dry eyes. Men made up 36.6% of the dry eye patients in the current study, while women made up 63.6%. However, there was no statistical correlation between sex and the prevalence of dry eyes. The impact of the female sex on KCS may be diminished if the diabetes-related KCS lacks a preference for one sex over another. It has been proposed that sex differences are caused by inadequate tear production in menopausal women due to estrogen shortage, despite data showing that women taking hormone replacement treatment may be more susceptible to dry eyes. 21 54.3% of people had dry eye syndrome, and It appears that dry eyes and diabetes go along²¹

Study²² shows that meibomian gland dysfunction significantly contributes to ocular discomfort, frequently associated with decreased aqueous tear production. Pure MGD had the least severe ocular surface injury symptoms but also affected younger people, despite the degree of subjective complaints being comparable to all other groupings. Millions of people experience ocular symptoms such as stinging, burning, itching, sensitivity to light, and blurred vision, which are frequently weak associations between symptoms and specific clinical dry eye tests more common in women than men.²³ In the current study, women with type-2 diabetes have a 1.8 times higher incidence of dry eyes.

Conclusion

Dry eyes and diabetes seem to go together frequently. Type I diabetes is more likely to cause a milder degree of dry eye, but type 2 diabetes is more likely to cause mild to moderate dry eye.

Conflict of Interest: No

Acknowledgement: No

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