ORIGINAL ARTICLE

Frequency of Dry Eye in Glaucoma Patients Using Topical Antiglaucoma Therapy

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ABSTRACT

Aim: To determine the prevalence of dry eye in glaucoma patients using topical antiglaucoma therapy with timolol combination of dorzolamide.
Study Design: Descriptive observational study
Place and Duration of Study: Department of Ophthalmology, Bolan University of Medical & Health Sciences/Helper's Eye Hospital, Quetta from 1st July 2020 to 31st December 2020.
Methods: Seventy five patients of both genders were enrolled. Patients details demographics age, sex and body mass index were recorded after taking informed written consent. Patients using topical anti-glaucoma therapy for more than 12 months and having symptoms of stinging and burning sensations itching, watering, irritation, due to regular use of topical antiglaucoma drugs were presented in this study. Tear film break-up time test and Basal Schrimer's test was used to measure the frequency of dry eye syndrome as mild, moderate and severe.
Results: Forty five (60%) were females and 30 (40%) were males. Mean age of the patients were 48.67±12.44 years with mean body mass index 25.14±6.33 kg/m^2. Thirty seven (49.33%) patients had burning and stinging sensations, itching found in 15 (20%), watering and irritation found in 11 (14.67%) and dry eye sensations in 12 (16%) patients. Fifteen (20%) cases did not show dry eye syndrome in tear film break-up time test and in Basal Schrimer's test 14 (18.67%) patients was normal.
Conclusion: The use of topical anti-glaucoma therapy resulted to dry eye syndrome and also affects the stability of tear film.
Keywords: Tear film break-up time, Basal Schrimer`s test, Dry eye syndrome, Antiglaucoma therapy

INTRODUCTION

Glaucoma is a progressive optic neuropathy not always related with increased intraocular tension but often associated with (IOP). Pharmacological care with topical IOP–lowering medicines is the most common therapeutic approach for people with glaucoma.[1-3] The major pillar of treatment in developed countries with higher prevalence of glaucoma is topical IOP-lowering drugs.[4,5] The first line of pharmaceuticals preferably are beta-blockers and prostaglandin analogs (PGAs).[1,2] Some individuals use glaucoma with various topical drugs to manage the IOP.[1,3] Polypharmacy practice and frequent dosage improve exposure of patients to greater preservative doses. Because of long-term exposure to preservatives in formulating topical IOP-lowing medicine, deleterious effects can develop on the conjunctive, corneal, and trabecular meshwork.[6,7]

The patients who receiving long term glaucoma treatment, eye surface disease is unfortunately frequent.[8] The presence of preservatives in the drug is one of the explanations for this bad effect. The damaging effects on the surface of the eye can even reduce the quality of life.[9,10] Benzalkonium chloride is the most popular preservative and inhibits the microbial growth in your medicine. Conservators, by distorting the cell membrane lipids and cytoplasmic components, produce microbial cell death in the form of cationic surfactants.[11] The features of lipid destruction in benzalkonium chloride extend to lipids in the lacquer coating that solubilize after interaction with BAK.[12] The stability and evaporation regulation of the tear film is carried out by tear lipids. Its disorder is an important dry eye cause a prevalent condition of glaucoma among patients.[13,14] Anti-glucose drugs have been designated as a cause of evaporation of the dry eye by the International Dry Eye Workshop.[13]

The patients utilizing topical anti-glucose drugs prior studies studied the function of tear. Examples of popular tests utilized include Tear Break-up Time (TBUT) and Schirmer tests. Tear film osmolarity (TFO) is another measure to be used to evaluate tear film dry eye. Tear film osmolarity measurements were shown to be appropriate and also superior in terms of the dry eye diagnosis to other forms of testing.[14-16] Tear film osmolarity measures with a coefficient of 0.55 are best indication of dry eye gravity compared with other clinical tests.[17]

Tear film osmolarity is increased in dry eye sufferers. This also induces epithelial cells to increase osmolarity on the ocular surface. A cascade of proinflammatory cytokines is driven by the cell hyperosmolarity. Currently hyperemia, shallow point keratites and eye pain feelings are just few of tear cytokine overexpression clinical signs.[18] Tear film osmolarity has been shown to be higher compared to normal levels in patients having topical treatment for glaucoma.[19,20] These TFO values were not, however, compared as control in the earlier trials with a group of standard patients. Januleviciene et al[20] examine TFO change when patients switch to preservative-free variations from the preserved anti-glaucoma drug, whereas Labbe et al[19] have conducted cross-sectional studies to assess the impact on TFO of preserved topical anti-glaucoma drugs.

This study examines the frequency of dry eyes in glaucoma patients who use topical anti-glaucoma medicines.

MATERIALS AND METHODS

This descriptive/observational study was conducted at Department of Ophthalmology, Bolan University of Medical & Health Sciences/Helper's Eye Hospital, Quetta from 1st July 2020 to 31st December 2020 and comprised of 75 patients. Patients details demographics age, sex and body mass index were recorded after taking informed written consent. Patients had rosacea and blepharitis problems and those did not give any written consent were excluded. Patients were aged between 20-75 years of age. Patients using topical anti-glaucoma therapy with timolol combination of dorzolamide for more than 12 months and having symptoms of stinging and burning sensations itching, watering, irritation, due to regular use of topical antiglaucoma drugs were presented in this study. Tear film break-up time test and Basal Schrimer's test was used to measure the frequency of dry eye syndrome as mild, moderate and severe. Complete date was analyzed by SPSS 22.

RESULTS

There were (60%) females and 30 (40%) were males. Mean age of the patients were 48.67±12.44 years with mean body mass index 25.14±6.33 kg/m^2. Thirty seven (49.33%) patients had burning and stinging sensations, itching found in 15 (20%), watering and irritation found in 11 (14.67%) and dry eye sensations were found in 12 (16%) patients (Table 1).

Table 1: Baseline details and symptoms of enrolled cases (n=75)

Variable	No.	%
Mean age (years)	48.67±12.44	
Mean BMI (kg/m^2)	25.14±6.33	
Gender		
Male	30	40.0
Female	45	60.0
Symptoms		
Burning and stinging	37	49.4
Itching	15	20.0
Watering and irritation	11	14.6
Dry eye sensations	12	16.0

Table 2: Frequency of dry eye syndrome after tear film break-up time test (n=75)

Tear film break-up time test	No.	%
Mild	20	26.7
Moderate	26	34.7
Severe	14	18.6
Normal	15	20.0

Table 3: Frequency of dry eye syndrome after Basal Schrimer's test (n=75)

Basal Schrimer's test	No.	%
Mild	19	25.4
Moderate	30	40.0
Severe	12	16.0
Normal	14	18.6

According to tear film break-up time test, 20 (26.75) patients had mild dry eye, 26 (34.67%) had moderate, 14 (18.67%) had severe and 15 (20%) cases had no dry eye syndrome (Table 2). According to Basal Schrimer's test 14 (18.67%) patients was normal while 19 (25.33%) cases had mild dry eye syndrome, 30 (40%) had moderate and 12 (16%) had severe (Table 3).

DISCUSSION

Although topical antiglaucomas are always the first-line anti-glaucoma therapy, it can have antagonistic effects on the visual surface for long-term, chronic ocular disorders such as glaucoma.[21,22] The severity of the harmful effects of preservatives is still under study in ocular solutions.[23,24] The long term use of these topical drugs has the potential to create a dry eye syndrome, subconjunctival fibrosis, epithel apoptosis, and cell loss.

The patients between 20-75 years of age with mean age was 48.67±12.44 years and mean body mass index 25.14±6.33 kg/m^2. There 45 (60%) cases were females and 35 (40%) were males. Our findings were comparable to the study of Kovačević et al[25]. There were total of 60 patients, 28 (46%) were male and 32 (54%) were female, age 45– 70 years (median 54.5 years).[26]

In this study, 37 (49.33%) patients had burning and stinging sensations, itching found in 15 (20%), watering and irritation found in 11 (14.67%) and dry eye sensations were found in 12 (16%) patients. In 2001, Pisella et al[27] reported burning and stinging (37%), a sensation of a foreign body (28%), dry eye sensations (22%), watering (20%). A dry eye sensation and eyelid itching were seen (17%). The outcomes of our investigation correspond to the aforementioned. In glaucoma patients, the drug's efficacy and quality of life have been affected by high prevalent of symptoms and indicators of dry eye syndrome.

According to tear film break-up time test, 20 (26.75%) patients had mild dry eye, 26 (34.67%) had moderate, 14 (18.67%) had severe and 15 (20%) cases had no dry eye syndrome. According to Basal Schrimer's test 14 (18.67%) patients was normal while 19 (25.33%) cases had mild dry eye syndrome, 30 (40%) had moderate and 12 (16%) had severe. These results were comparable to the previous study. In 66% (n=33) of patients who were on anti-glucidal medication a study conducted by Manusaini et al[28] indicated a severity of 34% (n=17 eyes) of the dry eyes and of levels 2 and 3. Another Leung et al study showed that 29% of patients did not develop dry eye symptoms. In 27% glaucoma patients, mild to moderate levels of eye surface disease have been detected, and in 35 (35%) individuals, significant tear deficit was found.[29]

The second largest cause of visual impairment is glaucoma that has a long-term effect on the quality of life. Throughout our lives, we cannot discontinue the patients' drugs, which do have specific adverse effects including dry eye condition. Compliance is questionable because to the relationship with dry eye disease. It can be detected early and processed concurrently, resulting in improved results.

CONCLUSION

The use of topical anti-glaucoma therapy resulted to dry eye syndrome and also affects the stability of tear film.

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