ORIGINAL ARTICLE

Dry Eye in Patients Using Topical Anti-Glaucoma Therapy

Nabila Zulfiqar[1], Muhammad Sufyan Aneeq Ansari[2], Khurram Nafees[3]
Rabia Nawaz[4], Manzra Shaheen[5]
[1-5]*Department of Ophthalmology, Fatima Memorial Hospital, Shadman, Lahore*

ABSTRACT

Purpose: To determine the frequency of Dry eye in Glaucoma patients using topical anti-glaucoma therapy.

Study Design: Descriptive Observational study.

Place and Duration of Study: Study was conducted in Outpatient department of Fatima Memorial Hospital Shadman, Lahore, from October 2016 to February 2017.

Material and Methods: In this study, 61 diagnosed cases of glaucoma were included. Patients with significant dermatological problems that may be associated with dry eye such as rosacea and blepharitis were excluded from the study. The individuals were assessed by consultant Ophthalmologist for Dry eye syndrome having symptoms of stinging and burning sensations itching, watering, irritation, due to regular use of topical anti-glaucoma drugs. A written consent was taken from every patient before the test. The ocular surfaces of the patients were evaluated using Tear film break-up time test and Basal Schrimer's test. Patients having TBUT less than 11 seconds were categorized as having dry eye. The degree of dryness was categorized as mild, moderate and severe Dry eye.

Results: Among 61 patients of glaucoma using topical anti-glaucoma therapy, 22 (36.1%) were male and 39 (63.9%) were female. Mean age of the patients was 50.76 ± 15.67 years. On the basis of Tear Film Break-up time test, 49 (81%) patients had Tear Break-up time less than 10 seconds and 12 (19%) patients were normal. On the basis of Schrimer`s test 51 (83.66%) patients had Dry eye.

Conclusion: Topical use of anti-glaucoma therapy affects tear film stability and its functions leading to dry eye syndrome.

Key Words: Anti-glaucoma therapy, Dry Eye Syndrome, Tear film break-up time, Basal Schrimer`s test.

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INTRODUCTION

Glaucoma is the second leading cause of visual impairment around the world[1-3]. It is a chronic disease that damages optic nerve and produces defects in the visual field which, in the last stage, can cause blindness. Treatment of glaucoma involves lifelong follow up[3,4].

For primary open-angle glaucoma (POAG) patients, first-line of treatment comprises of medical management. Topical hypotensive drops are the standard type of treatment, which are regularly utilized for longer duration in various dosing[3,5,6]. These drugs along with treatment may also have some side effects like allergic reactions, OSD (Ocular surface disease), tear film abnormalities, corneal epitheliopathy, punctate epitheliopathy, medically resistant herpetic

Correspondence to: Muhammad Sufyan Aneeq Ansari
Department of Ophthalmology,
Fatima Memorial Hospital, Shadman, Lahore
E-mail: msaansari@hotmail.com

keratitis, chronic inflammation, impaired wound healing, squamous metaplasia with high prevalence rate in diabetic and hypertensive patients[7]. OSD may result in poor effectiveness of glaucoma treatment leading to irreversible damage to eyes[8]. OSD (ocular surface disease) and inflammation have been commonly seen with the long term utilization of IOP-lowering medication. Symptoms include discomfort upon instillation and between instillations such as burning/stinging, foreign body sensation, watering, irritation, dry eye sensation and eyelid itching[7-11].

One of the major components of OSD is dry eye syndrome. Dry eye is a multifactorial disease of the tears and ocular surface that is related with distress, visual disturbance and tear film disturbance with potential to harm the ocular surface[12-14]. The incidence of dry eye syndrome increases with age, number and duration of anti-glaucoma medications [13].

There are several objective methods that have been used for assessing ocular surface health in glaucoma patients. These tests are: Tear Break up Time (TBUT), Schrimer's Test, Fluorescein Clearance Test (FCT), Rose Bengal ocular surface staining, bio microscopy, impression cytology and confocal microscopy[7,8,15].

This study was conducted to find out the frequency of Dry eyes in glaucoma patients who are using topical anti-glaucomatous drugs.

MATERIAL AND METHODS

This Observational study was conducted on the already diagnosed glaucoma patients from the ophthalmology outpatient department of Fatima Memorial Hospital Shadman, Lahore. A total of 61 Glaucoma patients were included in the study, 22 were males and 39 were females. All of these individuals were using topical anti-glaucoma therapy for more than 1 year. Patients with significant dermatological problems that may be associated with dry eye such as rosacea and blepharitis were excluded from the study. The individuals were assessed by consultant Ophthalmologist for Dry eyes by enquiring about symptoms of stinging and burning sensations, itching, watering, irritation, due to regular use of topical anti-glaucoma drugs. A written consent was taken from every patient before the test.

Two tests were performed by the ophthalmologist to assess Dry eye syndrome. 1) Basal schirmer's test 2) Tear film breakup time test (TBUT).

Schirmer's II test was performed by placing a small piece of Schrimer's strip inside the lower eyelid (inferior fornix) after putting a drop of local anaesthetic. The eyes were closed for 5 minutes. The paper strip was then removed and the amount of moisture was measured. Normal value of wetting of Schirmer's strip was ≥ 15 mm after 5 minutes. Patients with wetting values of Schirmer's strip less than or equal to 14 mm were labelled in the category of dry eye. Individuals having wetting values between 14-9 mm were having mild dry eye and those having wetting values of 8-4 mm had moderate dry eye. Individuals having wetting values of ≤ 4 mm of strip were categorized as severe dry eye syndrome.

Second test, which was performed, was to measure the TBUT; a small fluorescein strip was placed in the lower fornix of eye. The patients were asked to close the eyes for some time and then open it and blink the eyes. The strip was then removed and the cornea was scanned with Cobalt blue illumination of slit lamp. The time between the last blink and the appearance of the first dry spot in the tear film was recorded in seconds. Patients having TBUT less than 11 seconds were categorized as having dry eye. Individuals having TBUT 10-8 sec was categorized as having mild dry eye syndrome. Individuals with TBUT 7-5 sec had moderate dry eye syndrome and those having TBUT ≤ 4 sec had severe dry eye.

Data was entered and analysed by using SPSS V-22 (IBM Corp). The continuous variable such as age was expressed as mean ± SD. The categorical variables such as gender, symptoms of dry eye and severity of dry eye were expressed in the form of frequencies.

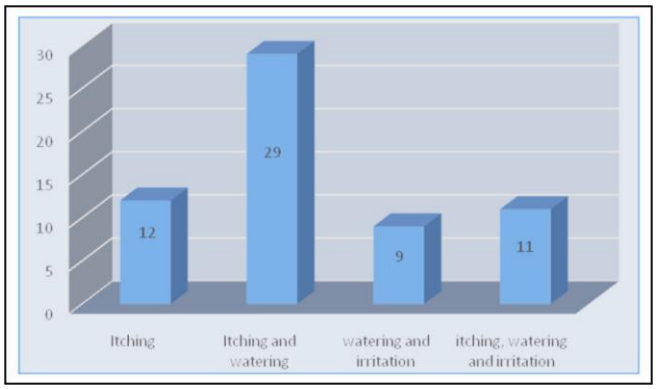
RESULTS

A total of 61 glaucoma patients were included in the study who were on topical anti-glaucoma therapy. Among these 22 (36.1%) were males and 39 (63.9%) were females. The mean age of the patients was 50.76 ± 15.67 years. Glaucoma Patients presented in the OPD with different symptoms of dry eye. Out of 61 patients, 29 (47.5%) patients had burning and stinging sensations, 12 (19.7%) patients presented with only itching. Nine (14.8%) patients were complaining of watering and irritation and 11 (18%) patients had Dry eye sensations.

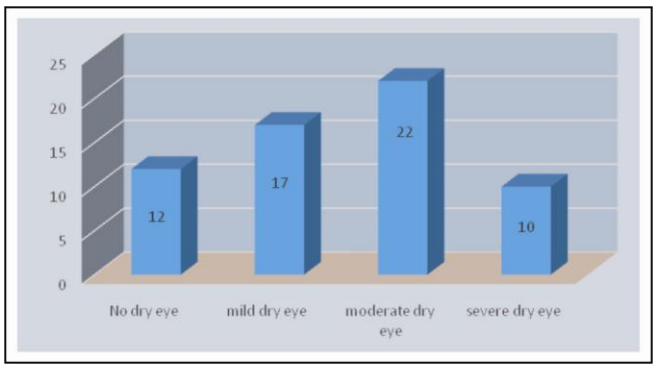
Tear film breakup time test was performed with fluorescein stain and the results showed that 12

(19.7%) patients had no dry eye. Whereas 17 (27.9%) patients had mild dry eye and 22 (36.1%) patients were diagnosed with moderate dry eye. Only 10 (16.4%) patients had severe dry eye.

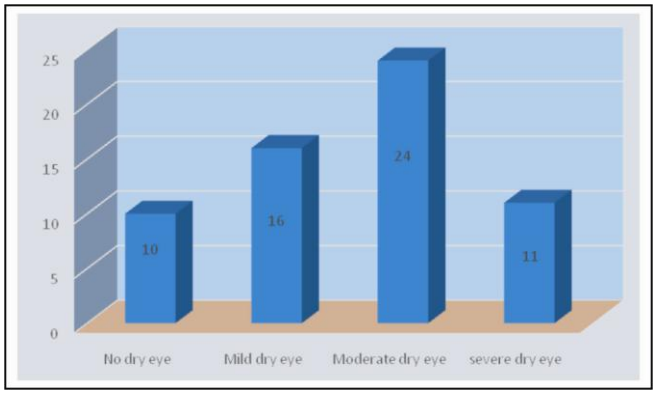
Another test, Basal Schirmer test was also done to evaluate the severity of dry eye syndrome. Results showed that 16 (26.2%) patients had mild dry eye and 24 (39.3%) patients had moderate dry eye. Eleven (18%) patients were diagnosed with severe dry eye (refer to graphs 1, 2 and 3).



Graph 1: Graphical distribution of symptoms of dry eye.



Graph 2: Graphical distribution of severity of dry eye by TBUT.



Graph 3: Severity of dry eye syndrome by basal schirmer's test.

DISCUSSION

Although topical anti-glaucoma drugs are always the first line therapy for the treatment of glaucoma but long-term use of topical medication in chronic ophthalmic conditions such as glaucoma, may antagonistically influence the visual surface[16,17]. However, the severity of the toxic effects of preservatives in ophthalmic suspensions is still under investigation[14,18]. The long term use of these topical medications have the potential to cause corneal and conjunctival changes, resulting in dry eye Syndrome, sub-conjunctival fibrosis, epithelial apoptosis, and goblet cell loss[5,7].

In this particular study there were 22 (36.1%) males and 39 (63.9%) were females which is comparable to a study conducted in 2013 by Suzana Kovačević et al. There were total of 60 patients, 28 (46%) were male and 32 (54%) were female, age 45–70 years (median 54.5y)[4].

A high prevalence of symptoms and signs of dry eye syndrome were found in glaucoma patients which hampers the efficacy of the drug and quality of life[9,19] . In 2001, Pisella et al. reported that the individuals using preserved anti-glaucoma medication had complaints of burning and stinging (37%), foreign body sensation (28%), dry eye sensation (22%), watering (20%), and eyelid itching (17%)[11]. Our results are consistent with the above study.

TBUT test evaluates the stability of the pre corneal tear film, and in different studies comparing signs, symptoms and predictive tools for dry eye disease and ocular surface disorders it is shown to be the most reliable test combined with vital staining. TBUT of 6.4 ± 5.9 seconds in glaucoma individuals using topical anti-glaucoma therapy was also reported by Baffa Lina do prado et al. in 2007 indicating ocular surface alterations due to anti-glaucoma therapy[20]. In the present study, TBUT of 6.4 ± 2.2 seconds was seen in glaucoma patients on topical anti-glaucoma therapy and the results are comparable to the above study.

Another study conducted by Manusaini et al showed level 1 severity of dry eye in 34% (n = 17 eyes) and levels 2 and 3 severity was present in 66% (n = 33 eyes) individuals who were on anti-glaucoma therapy[7]. Our results also confirm this.

Leung et al reported that 29% of patients had no symptoms of dry eye. Mild to moderate level of OSD was found in 27% glaucoma patients and severe tear deficiency was present in 35 (35%) patients[9]. This is comparable to the present study in which 10 (16.4%) patients had no dry eye.

Glaucoma being second leading cause of visual impairment has a long-term impact on the quality of life. We cannot stop the medication of the patients throughout their life, which do have certain side effects such as dry eye syndrome. The association of dry eye syndrome makes the compliance questionable. We can detect this early and treat it concomitantly which would result in better outcome.

The Limitations of the study was its small sample size. The patients included in the present study (glaucoma patients) were from the same locality. Another limitation was that we did not compare the dry eye tests before and after the use of anti-glaucoma therapy. Only the patients who were already using anti-glaucoma therapy were included in our study.

CONCLUSION

There is high rate of dry eye in glaucoma patients using topical anti-glaucoma therapy. The patients should be on regular follow-ups with their Ophthalmologists to detect the dry eye complications related with anti-glaucoma therapy.

Ethical Approval

The study was approved by the Institutional review board/Ethical review board.

Conflict of Interest

Authors declared no conflict of interest.

Authors' Designation and Contribution

Nabila Zulfiqar; Optometrist: *Concept and study design, analysis and interpretation of data, manuscript write up, literature research.*

Muhammad Sufyan Aneeq Ansari; Assistant Professor: *Concept and study, Final review of manuscript.*

Khurram Nafees; Assistant Professor: *Concept and design of manuscript, Final review.*

Rabia Nawaz; Optometrist: *Manuscript drafting and revision of content, Final review.*

Manzra Shaheen; Optometrist: *Critical final review.*

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