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Study of Association of Tear Film Abnormalities in All Grades of Primary Pterygium Cases using Schirmer's Test 1 & 2

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ABSTRACT

Background: One of the frequent ocular disorders affecting people in their middle and advanced years of age is pterygium. It is a benign, proliferative disorder of the conjunctiva and subconjunctival tissue that has the potential to impair vision. Clinical examination can quickly diagnose and stage it. Sunlight exposure is believed to be the most significant element in the development of pterygium. Dry eyes, smoking, prolonged outdoor activity, low socioeconomic position, and high altitudes are additional risk factors. If it grows onto the cornea's centre, a major problem is the obliteration of the visual axis. Another reason for impaired vision is the development of irregular astigmatism brought on by flattening of the cornea in the horizontal meridian.

Aim: The aim of the study was to determine the association of Tear film abnormalities with all grades of pterygium

Materials and Methods: The current study was a single-center observational study that was conducted out from December 2020 to July 2022 in the ophthalmology division of Sri Siddhartha Medical College hospital and Research Centre, Tumkur, on patients who attended the OPD with primary pterygium, regardless of treatment. According to the study's inclusion criteria, a total of 91 participants who were diagnosed with pterygium were enrolled.

Results: The majority of participants (34.07%) were between the ages of 61 and 70. Pterygium prevalence was higher in females (65.93%) than in males (34.07%) with a 1.96:1 ratio. The majority of the participants (69.23%) had progressive pterygium, followed by regressive pterygium (15.38%) & atrophic pterygium (15.38%). The mean scores of the schirmers tests 1 and 2 in both eyes differed significantly statistically depending on the degree of pterygium (p=0.03).

Conclusions: Pterygium is one of the most common ocular conditions in our nation, primarily affecting people from lower socioeconomic backgrounds. Pterygium has been linked to tear film abnormalities.

ARTICLE DETAILS

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KEYWORDS: Dry eyes, Pterygium, Tear Film.

INTRODUCTION

One of the frequent ocular disorders affecting people in their middle and advanced years is pterygium. It is a benign, proliferative, degenerative disorder of the conjunctiva and subconjunctival tissue that has the potential to impair vision. Clinical examination can quickly diagnose and stage it. Sunlight exposure is regarded to be the most significant element in the development of pterygium. If it grows onto the cornea's centre, a serious problem is the obliteration of the visual axis. Another reason for a reduction in vision is the emergence of irregular astigmatism brought on by the flattening of the cornea in the horizontal meridian. According to multiple research, the approximate global prevalence of pterygium ranged from 2.8 to 33% [1, 2].

RISK FACTORS

- Ultraviolet light exposure
- outdoor occupation
- smoking & alcohol
- low socioeconomic status
- Tearfilm abnormalities
- lack of protective glasses

PATHOGENESIS OF PTERYGIUM

UV radiation causes damage to the bowman's membrane as well as thickening and hyperplasia of the connective tissue in the bulbar subconjunctiva. The first clinical alteration will be observed at the level of the Bowman's membrane[3, 4]. The fibroblasts at the limbus will begin their pair process as a result of this injury. Elastic material will accumulate as a result of the reparative process. The Bowman's membrane and the epithelium form a plane in which the pterygia's head develops and inflammatory reactions take place. Blood vessels will start to expand as a result of the increased cellular activity. Angiogenesis is aided by the lymphokines generated by the lymphocytes.

CLASSIFICATION OF PTERYGIUM

The following sections can be separated into it anatomically:

- Fuss patches and grey patches can be observed close to the head, while Stockers line is a brownish line that is caused by chronic pooling of tears anterior to the cap
- Base- paralimbal conjunctiva
- Superior edge-upper edge of traingular flap
- Inferior edge-lower edge of triangular flap
- Cap - non vascular fibrous portion of pterygium
- Head- highly vascular and raised part of the apex
- Body- elevated fleshy portion with congested tortuous vessels

Observations that are used to determine the pterygium's severity include the following:

Length of corneal encroachment

- Stage 0: posterior pingecula
- Stage 1: limited to the limbus
- Stage 2: marginal corneal invasion
- Stage 3: between limbus and pupillary border
- Stage 4: central to the pupillary margin

According to the Tear Film Ocular Surface Society's (TFOS), Dry Eye Workshop (DEWS) II definition of DED, dry eye is a multifactorial ocular surface condition that is described as a vicious cycle of tear film instability and hyperosmolarity[5,6]. Ocular surface homeostasis imbalance results in inflammation, injury, and anomalies of the neurosensory system[7,8]. If DED occurs, ocular surface damage may worsen if it's not treated on time[7].

Schirmer's test is carried out as follows to evaluate the production of aqueous tears

- Sterilized paper strips are placed in the inferior-temporal area of the conjunctival sac in both eyes
- The patient was instructed to close their eyes, and the wetted length was measured in millimetres after 5 minutes[9].
- A normal score is considered to be greater than 10 mm in 5 minutes, and a score of less than 5 mm in 5 minutes indicates a tear deficit[10,11,12].

The examination is offered in two formats

- Without topical anaesthesia, this measures total tear production and includes basal and reflex flow
- With topical anaesthesia for the patient's comfort - This measures basal tear production[9].

TREATMENT OF PERYGIUM

Medical Management

Topical medications

1. Bevacizumab
   There is proof that Vascular Endothelial Growth Factor (VEGF) had a part in the pterygia pathogenesis[13].Bevacizumab can be given as drops with a dosage of 25 mg/ml four times each day for three weeks[14].
2. CyclosporineA causes reduction in the cellular proliferation. Use of 0.05% will stop proliferation[15].
3. Though mitomycin C 0.02% can prevent recurrences, but not used due to its side effects.

Subconjunctival medications

It is possible to use mitomycin C, 5 fluorouracil (5 FU), duanorubicin, bevacizumab, transtuzumab, and tiamcinolone with 5 FU.

All of them aid in preventing recurrences.

MATERIALS AND METHODS

The present study was a single-center, observational Study conducted on patients came with Pterygium, in the ophthalmology department of Sri Siddhartha Medical College hospital and Research Centre, Tumkur from December 2020 to July 2022. Prior initiation of the study obtained Ethical and Research Committee clearance from Sri Siddhartha Medical College hospital and Research Centre, Tumkur. In the current study, a total of 111 pterygiums were examined in the OPD; 91 of these patients were enrolled in the study based on the inclusion criteria, and 20 patients were excluded based on the exclusion criteria.

All patients underwent detailed history and ocular examination which included symptoms of pterygium, visual acuity using Snellen's chart along with slit lamp

examination to visualize the anterior segment of both the eyes. Schirmer's test 1&2 of both eyes was done and documented.

INCLUSION CRITERIA

The study includes all individuals with primary grade pterygium who attends the outpatient department.

EXCLUSION CRITERIA

- Patients having adnexa, ant/post segment diseases that could alter tear secretion and stability
- Both male and female patients who are older than 70 years old and younger than 20 years old are excluded from the study
- Patients having ocular chemical burns.
- Patient having history of ocular surgery,trauma or any corneolimbal scars.
- Patient having blepharitis and lacrimal system disorder.

DATA ENTRY AND ANALYSIS

The data was entered in Excel spread sheet. Descriptive statistical analysis was done by mean and standard deviation for quantitative variables and frequency/percentage for categorical variables. The association between categorical variables was analyzed by using Chi-square test. The data was analyzed by using SPSS software (version 20) and $P<0.05$ was considered as level of significance.

RESULTS

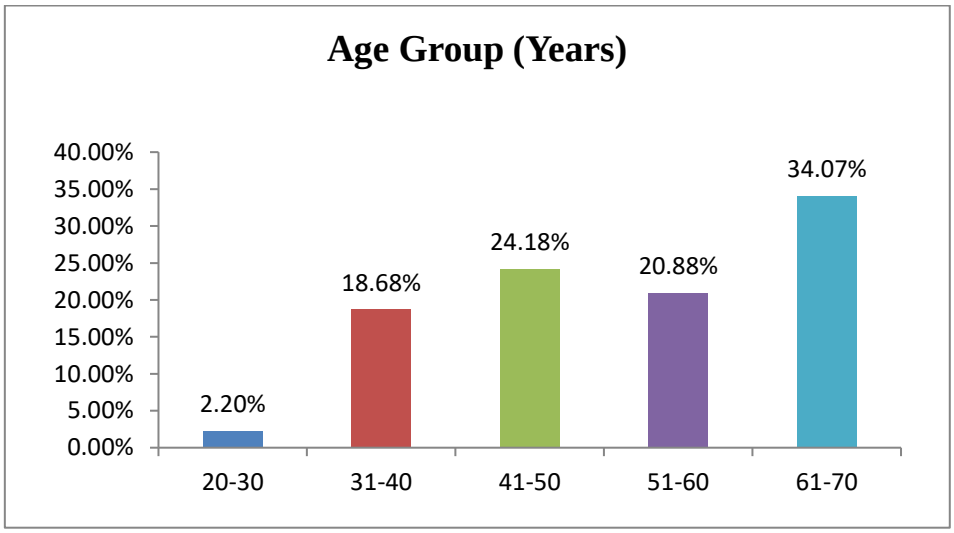

Figure 1. participants were distributed according to age group.

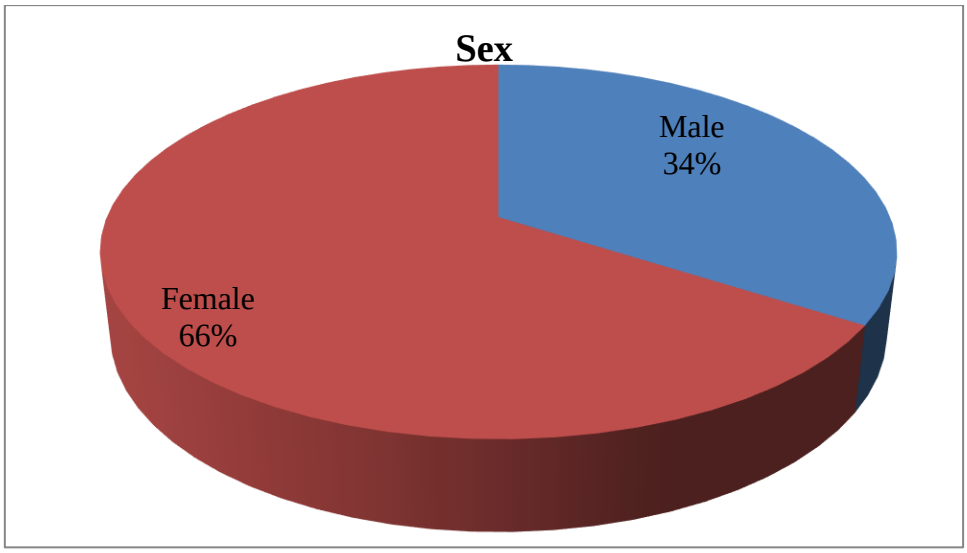

Figure 2. Participants were distributed according to gender

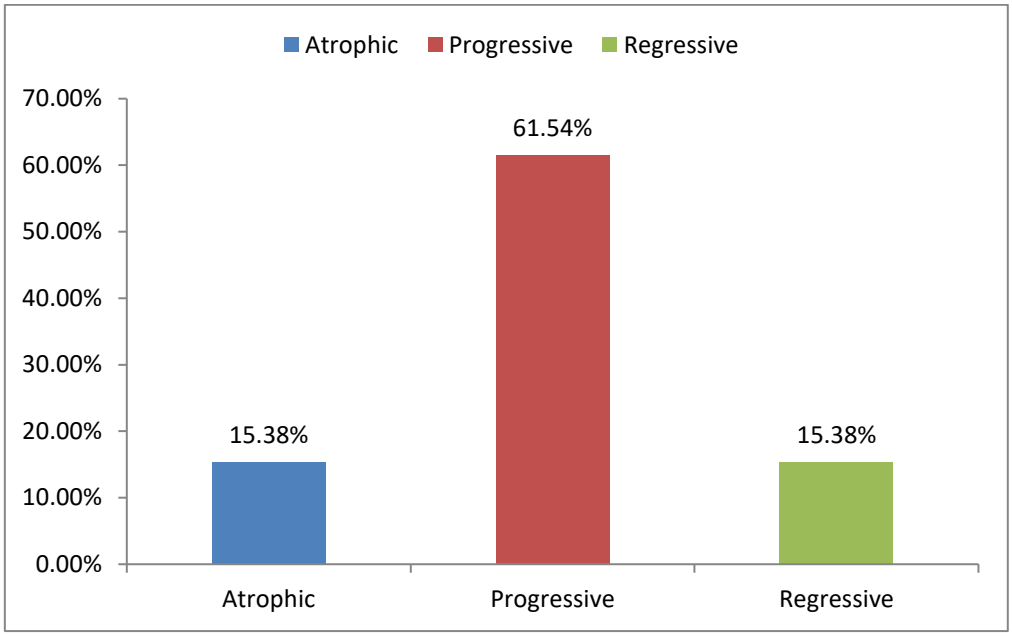

Figure 3. Participants were distributed according to type of pterygium

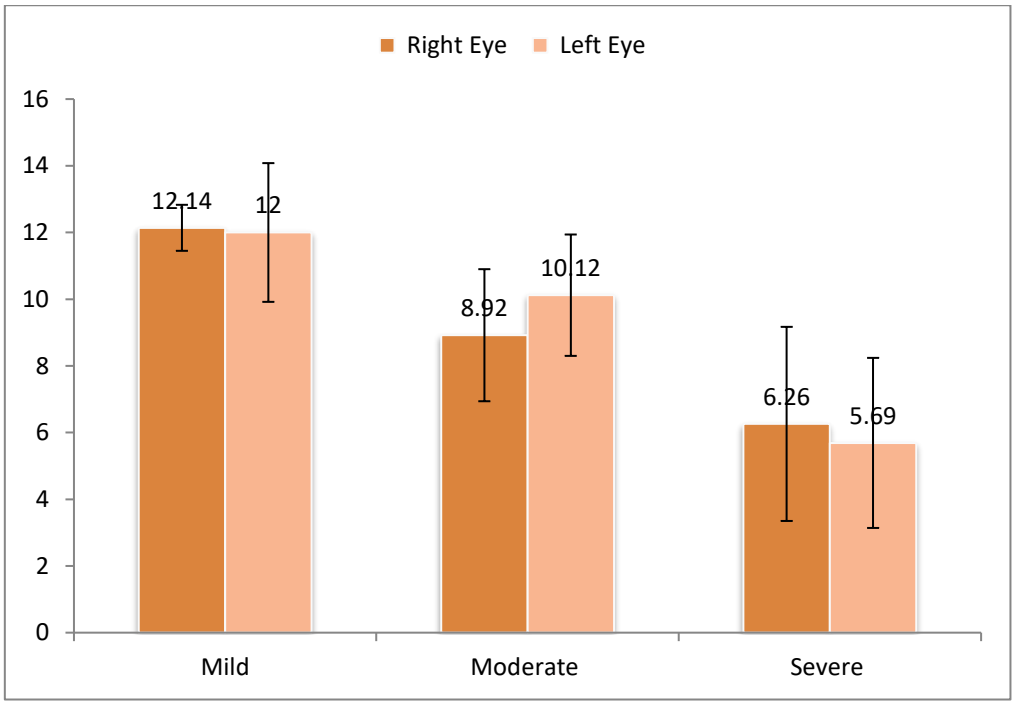

Figure 4. Comparison of the Schirmer's test 1scores based on severity of pterygium

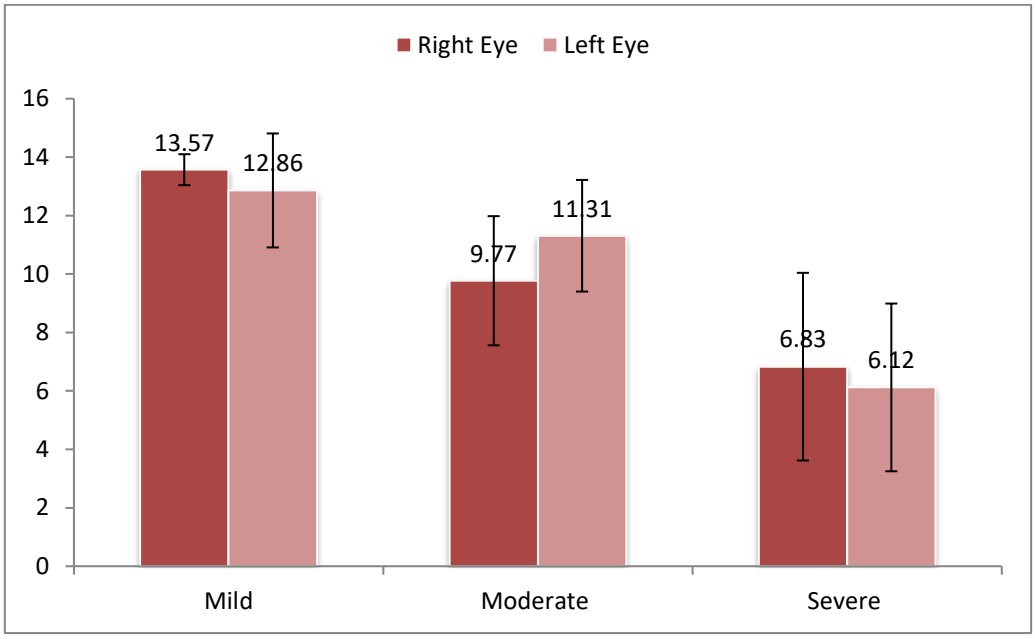

Figure 5. Comparison of the Schirmer's test 2 scores based on severity of pterygium

DISCUSSION

This study included 91 patients in total. A large majority of participants (34.07%) were between the ages of 61 and 70, while only 24.12% were between the ages of 41 and 50. There were 65.93% female participants, or 60 of them, and 34.07% male participants, or 31 of them. This was correlating with the study done by MarmamulaS et al and Anguria P et al [16].

In our study we found that majority of the patients, or 69.23%, had progressive pterygium, followed by 15.38% of patients with regressive pterygium and 15.38% of patients with atrophic pterygium, distribution of patients according to the type of pterygium was statistically significant, with p value of 0.01. The results were in accordance with the studies conducted by, Ajayi Iyiade A et al [17], Droutsas K et al[18]. The average Schirmer's test 1 score for the right eye was 12.14± 0.69 in cases of mild pterygium, 8.92 ± 1.98 in cases of moderate pterygium, and 6.26± 2.91 in cases of severe pterygium. With mild pterygium, the average Schirmer's test 1 score for the left eye was 12.00 ± 2.08; with moderate pterygium, it was 10.12 ± 1.82; and with severe pterygium, it was 5.69 ± 2.55. The average Schirmer's test 2 score for the right eye was 13.57± 0.53 in cases of mild pterygium, 9.77± 2.21 in cases of moderate pterygium, and 6.83± 3.21 in cases of severe pterygium.

The mean Schirmer's test 2 score for the left eye was 12.86 ± 1.95 in mild pterygium, 11.31± 1.91 in moderate pterygium, and 6.12±2.87 in severe pterygium. According to the severity of the pterygium, there was a statistically significant difference in the mean values of Schirmer's test scores (p = 0.03). The schirmers test 1&2 scores were reduced in severe pterygium participants.Our results are in accordance with the studies conducted by **Saw SM et al [19] and Moustafa K N et al [20].**

CONCLUSION

The result of this study statistically indicates that there is an association of tear film abnormalities with pterygium. The study has clearly demonstrated that schirmers test 1& 2 are the basic diagnostic tools to evaluate tear film abnormalities in cases of pterygium. Proper understanding of the assessment of tear film instability owing to this condition is essential for planning appropriate measures to prevent the occurrence and thereby reducing the physical and financial burden to the society.

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None

CONFLICT OF INTEREST

None

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