DRY EYE IN PATIENTS WITH PTERYGIUM- A CROSS-SECTIONAL STUDY AT A TERTIARY CARE CENTRE IN THRISUR

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ABSTRACT

BACKGROUND
Pterygium is a degenerative condition of the eye, recorded since ancient times.1 It is seen as a triangular patch on the exposed part of the eye. The main disadvantage due to the disease is cosmetic. It also causes vision defect due to either refractive error or extending over the visual axis.

Aims and Objectives of the study are-
1. To find out proportion of dry eye among patients with Pterygium.
2. To find out the factors associated with dry eye among patients with Pterygium.

MATERIALS AND METHODS
A cross-sectional study was done on patients with clinical diagnosis of Pterygium. Information was collected on age, sex, occupation, dietary habit, smoking, menstrual history and systemic illness. Ocular examination including refraction with spectacles, Pterygium, Dry Eye, Schirmer’s test, Tear film Break-up Time, Tear Meniscus Height and Size of Pterygium was conducted. Data was entered into Microsoft Excel. Statistical analysis was made using Chi-Square test and Correlation.

RESULTS
- Dry eye condition was assessed on the basis of the tests. 20.32% of eyes on Schirmer’s test, 35.77% of eyes on TBUT and 62.60% of eyes on TMH were found to have dry eye.
- Mean value of Schirmer’s test was 16.70 mm on right eye and 18 mm on left eye.
- Mean value of TBUT was 10.2 sec on right eye and 10.7 sec on left eye.
- Mean value of TMH was 0.4 mm in both eyes.
- The Dry eye tests of right and left eyes did not show significant difference in the case of unilateral Pterygium.
- The association between Dry eye tests and presence of Pterygium also did not show any statistically significant association, except in the case of TBU and Pterygium on right eye.
- Association between dry eye tests and risk factors was positive only in the case of aged.
- The Dry eye tests between right and left eyes showed strong correlation, irrespective of unilateral or bilateral Pterygium.

CONCLUSION
Dry eye condition is seen in at least 20.32% of eyes, but significant association between Dry eye and presence of Pterygium is not seen. Age showed positive association with Schirmer’s test among the Pterygium patients. Also refractive error showed positive association with TBUT among the Pterygium patients.

KEYWORDS
Pterygium, Dry Eye, Schirmer’s Test, TBUT, TMH.


At present, the medical treatment is not satisfactory. The only effective approach is surgical, but there is chance of high recurrence rate. The major risk factor for Pterygium is ultraviolet B-light in sunlight.

Rationale
In Kerala, Pterygium is a common disease. The people engaged in outdoor work are not routinely using hat or protective sunglasses. Studies on the problem of Dry eye in patients with Pterygium give a wide range in different parts of the world. Study on the problem is not seen in Kerala. The present study aims to assess Dry eye condition in patients with Pterygium.

1Financial or Other Competing Interest: None.
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DOI: 10.14260/jemds/2018/176
Objectives of the Study
1. To find out the proportion of Dry eye in patients with Pterygium attending Ophthalmology Department at Government Medical College, Thrissur using various tests.
2. To find out the factors associated with Dry eye among these patients.

MATERIALS AND METHODS

Study Design
Cross-sectional study.

Study Setting
Department of Ophthalmology, Government Medical College, Thrissur.

Study Period
9 Months (01st Feb - 01st Nov 2015).

Study Subjects
Patients with Pterygium attending the Outpatient section at Department of Ophthalmology, Medical College, Thrissur.

Inclusion Criteria
 Patients with clinical diagnosis of Pterygium and willing to participate in the study.

Exclusion Criteria
Patients with acute eye condition like watering, itching or pain are excluded. Those who had eye surgery within the last one month or awaiting surgery in the next few days.

Sample Size
100, calculated using the formula n = 4pq/d^2,

Where-
p = prevalence of dry eye in patients with Pterygium, 50% q = 100 - p
d = clinically allowable error, which is 20% of prevalence.
Power of study at significance level of 0.05 is 80%.

Study Tools
1. Pre-tested questionnaire.
2. External eye examination under torch light.
3. Slit lamp examination and direct ophthalmoscopy.
4. Schirmer’s test without anaesthesia.
5. Tear film break-up time test.
6. Marginal tear film Meniscus Height.

Methodology
After obtaining informed consent, data was collected from each patient using a pre-tested questionnaire. Visual acuity, size of Pterygium, refractive power, Schirmer’s test, Tear film Break-up Time and Tear Meniscus Height were assessed. Tests were done for each eye.

Operational Definition
Occupation
Working in sunlight at least 6 hours per day for at least 3 days per week was considered as outdoor occupation; other occupations as indoor.

Diet
Eating either fish or meat at least twice per week was considered as non-vegetarian; others as vegetarian.
Smoking: Smoking at least once per day was considered as smoking present; others as non-smoking.

1. Schirmer’s Test I (Test without Anaesthesia)- Whatman No. 41 filter paper folded at one end, kept inside the lower eye lid at the junction of medial 2/3rd and lateral 1/3rd. The patient was asked to keep the eyes open for 5 minutes. Gentle blinking was allowed if needed. At the end of 5 minutes, reading on the strip was taken. This data was then taken for analysis.

2. Tear film Break-up Time- Fluorescein strip was used to stain the tear film by keeping the chin on the slit lamp chin rest. Patient was asked to blink a few times, then to keep the eyes open. The tear film over the cornea was examined under cobalt blue filter with broad beam of slit lamp. Time taken between the last blink and the appearance of first dry spot was taken in seconds.

3. Tear Meniscus Height- The height of the tear meniscus is taken by directing the slit lamp beam towards the lower lid margin and adjusting the size of graticule to match the meniscus height.

4. Size of the Pterygium from the limbus to apex was taken by keeping the beam of slit lamp in the horizontal axis.

5. Dry eye was considered to be present on the basis of the tests:
Schirmer’s test without anaesthesia :  less than 10 mm
TIBUT : less than 10 seconds
TMH : less than 0.50 mm

Ethical Clearance and Conflict of Interests
Study proposal was cleared by Institutional Research Board prior to beginning of data collection. There was no conflict of interests involved. There were no external funding sources.

Data Analysis
Collected data were coded and entered in Microsoft Excel 2010. Statistical analysis was done using Epi-Info 3.5. Chi-Square test was used to find association. P value less than 0.05 was considered as significant.

RESULTS
Out of estimated 100 patients with Pterygium on either one eye or both eyes, only 85 patients participated in the study, among which 29 were male and 56 were female patients.

Size of Pterygium
The overall mean values of size of Pterygium were 1.24 for right eye with mean values of 1.10 for males and 1.31 for females. It was 1.18 left eyes with mean values of 1.00 for males and 1.27 for females.
Table 1. Age-Wise Comparison of Mean Values of Size of Pterygium

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Observed Frequency Table</th>
<th>d.o.f.</th>
<th>Chi-Square Value</th>
<th>Critical Value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SCHRIMER&lt;10 (Dry Eye)</td>
<td>4</td>
<td>9.02</td>
<td>9.49</td>
<td>P value 0.06061 p&gt;0.05 not significant</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35</td>
<td>Yes</td>
<td>0</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36-45</td>
<td>Yes</td>
<td>5</td>
<td>12</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>3</td>
<td>17</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>46-55</td>
<td>Yes</td>
<td>10</td>
<td>16</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>8</td>
<td>8</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>&gt;65</td>
<td>Yes</td>
<td>9</td>
<td>8</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>58</td>
<td>85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Association between Age and Dry Eye Examination among Pterygium Patients

Table 4. Pearson’s Correlation Dry Eye Test Values and Size of Pterygium

DISCUSSION

Proportion of Dry Eye Condition in the Patients with Pterygium

Based on Schirmer’s Test- 19.04% of right eyes with Pterygium and 21.66% of left eyes with Pterygium have dry eye. So on an average, 20.32% of eyes with Pterygium have dry eye. Different studies show a wide range from 8.00% to 52.00%.

Based on TBOU

44.4% of right eyes with Pterygium and 26.66% of left eyes with Pterygium have dry eye. On average, dry eye is seen in...
35.77% of eyes with Pterygium. Different studies show range from 30.00% to 75.60%.

<table>
<thead>
<tr>
<th>Present Study</th>
<th>Goldberg3</th>
<th>Roka N4</th>
<th>Ranjana5</th>
<th>Atiya6</th>
<th>Balogun7</th>
<th>Amer Y8</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.77%</td>
<td>50.84%</td>
<td>43.42%</td>
<td>30.00%</td>
<td>75.60%</td>
<td>39.70%</td>
<td>47.20%</td>
</tr>
</tbody>
</table>

**Dry Eye Condition based on TBUT**

Based on TMH

63.49% of right eyes with Pterygium and 61.66% of left eyes with Pterygium have dry eye. On an average, 62.60% of eyes with Pterygium have dry eye.

<table>
<thead>
<tr>
<th>Present Study</th>
<th>Muhammad Saleem9</th>
</tr>
</thead>
<tbody>
<tr>
<td>62.60%</td>
<td>37.50%</td>
</tr>
</tbody>
</table>

**Dry Eye Condition based on TMH**

**Mean value of dry eye tests on patients with Pterygium (N=85)**

<table>
<thead>
<tr>
<th>Right Eye</th>
<th>Left Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.70 mm</td>
<td>10.00 mm</td>
</tr>
</tbody>
</table>

(Male: 15.90 mm, Female: 17.20 mm)

**Mean value of TIBUT**

<table>
<thead>
<tr>
<th>Right eye</th>
<th>Left eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.30 sec</td>
<td>10.70 sec</td>
</tr>
</tbody>
</table>

(Male: 10.40 sec, Female: 10.10 sec)

**Mean value of TMH**

<table>
<thead>
<tr>
<th>Right eye</th>
<th>Left eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.40 mm</td>
<td>0.40 mm</td>
</tr>
</tbody>
</table>

(Male: 0.40 mm, Female: 0.40 mm)

**Mean value of dry eye test in the case of unilateral Pterygium**

<table>
<thead>
<tr>
<th>R. Eye</th>
<th>Opposite Normal Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 mm</td>
<td>19 mm</td>
</tr>
</tbody>
</table>

Left eye with Pterygium

<table>
<thead>
<tr>
<th>L. Eye</th>
<th>Opposite Normal Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 mm</td>
<td>17 mm</td>
</tr>
</tbody>
</table>

**Mean Value of Schirmer Test**

<table>
<thead>
<tr>
<th>Present Study</th>
<th>Kampitak10</th>
<th>Chaidaroon11</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. Eye</td>
<td>Opposite Normal Eye</td>
<td>Eyes with Pterygium</td>
</tr>
<tr>
<td>18 mm</td>
<td>19 mm</td>
<td>9.8 mm</td>
</tr>
<tr>
<td>L. Eye</td>
<td>Opposite Normal Eye</td>
<td>18 mm</td>
</tr>
</tbody>
</table>

**Mean Value of TBUT**

<table>
<thead>
<tr>
<th>Present Study</th>
<th>Kampitak10</th>
<th>Balogun7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Eye</td>
<td>Opposite Normal Eye</td>
<td>Eyes with Pterygium</td>
</tr>
<tr>
<td>9 sec.</td>
<td>10 sec.</td>
<td>5.5 sec.</td>
</tr>
<tr>
<td>Left Eye</td>
<td>Opposite Normal Eye</td>
<td>11 sec.</td>
</tr>
</tbody>
</table>

Range of Dry Eye Tests

**Range of Schirmer’s test**

1 mm to 35 mm

<table>
<thead>
<tr>
<th>Present Study</th>
<th>Rajiv12</th>
<th>Muhammad Saleem9</th>
<th>Roka N4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mm to 35 mm</td>
<td>3 mm to 9.4 mm</td>
<td>3 mm to 14 mm</td>
<td>2.50 mm to 35 mm</td>
</tr>
</tbody>
</table>

Range of TIBUT

3 seconds to 20 seconds.

<table>
<thead>
<tr>
<th>Present Study</th>
<th>Muhammad Saleem9</th>
<th>Roka N4</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 sec. to 20 sec.</td>
<td>3 sec. to 14 sec.</td>
<td>2.5 sec. to 27.50 sec.</td>
</tr>
</tbody>
</table>

**Correlation between Dry eye and size of Pterygium**

The present study found weak or negligible correlation between dry eye and size of Pterygium. This agrees with the observation by Kampitak et al.10

**CONCLUSION**

On the basis of different criteria, at least 20.32% of eyes with Pterygium (either unilateral or bilateral) are affected with dry eye. The tests showed different proportions of dry eye condition among the patients with Pterygium:

- Schirmer’s Test : 20.32%
- TIBUT : 35.77%
- TMH : 62.60%

Age showed no association with dry eye.

**ACKNOWLEDGEMENT**

All the patients who participated in the study.

**REFERENCES**


