

PREVALENCE OF PTERYGIA IN A RURAL POPULATION IN GUYANA,  
SOUTH AMERICA

by

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This paper is submitted in partial fulfillment of the requirements for the degree of  
Doctor of Optometry

Ferris State University  
Michigan College of Optometry

March 30, 2011

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AMERICA

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Has been approved

March 30, 2011

A handwritten signature in blue ink, appearing to be 'Jordan Kuipers', is written over a faint, illegible printed name.

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AMERICA

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## ABSTRACT

*Background:* The aim of this study was to determine the prevalence of pterygia in a Guyanese clinic population. *Methods:* The records of 1,100 Guyanese patients examined in an optometry clinic in Hampshire, Guyana were reviewed retrospectively. The clinical examination was carried out by an experienced optometrist and optometry students. The presence and grades of pterygia were diagnosed at the examination. *Results:* Through the use of exam data, we will set out to group prevalence of pterygia in certain age groups and the sex that pterygia are most prevalent in Hampshire, Guyana. *Conclusions:* Pterygia are highly prevalent in Guyanese patients in our clinic population. Any pterygia that were deemed visually detrimental were referred for removal by an ophthalmologist.

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## **Introduction**

Pterygia are benign, degenerative connective tissue growths on the bulbar conjunctiva that can encroach on the eye's visual axis.<sup>1,2</sup> Ultraviolet light exposure is an associated risk factor for the development of pterygia, and those living in tropical areas in close proximity to the equator are at the highest risk.<sup>1</sup> If pterygia growth becomes deep enough into the cornea, unwanted astigmatism can occur, and distort one's vision.<sup>1</sup> A study in Barbados, West Indies included 2781 subjects and found a prevalence rate of 23.7%, while other studies conducted in other nations have found prevalence of pterygia to range from 0.35-31.1%.<sup>2,3</sup> Our study aimed to describe the prevalence of pterygia among residents by age and gender in the South American country of Guyana, where we performed vision screenings on over 1,100 patients.

## **Methods**

An optometry clinic was set up in a local church in Hampshire, Guyana. 1,100 patients were screened over a period of one week. Patients were examined by one experienced optometrist and twelve optometry students from the Michigan College of Optometry, made up of four third year students and eight second year students. The screening consisted of case history, visual acuity, retinoscopy, anterior segment evaluation and a dilated fundus exam. If treatment was indicated a variety of donated glasses were available as well as artificial tears, antibiotics, anti-histamines and glaucoma medications. All exam data was documented on a form that the patient received at the entrance to the clinic and returned when exiting the clinic. Prior to opening the clinic, we educated the other students and the doctor on pterygia. They were each

told how to assess and grade pterygia, and were given a form describing the four different grades of pterygia with illustration (see Figure 1). They were instructed to refer to this form when grading pterygia and clearly document what they observed. If it was determined that the pterygia was significant, the patient was educated on the condition and given any combination of the following; glasses, sunglasses, artificial tears and anti-histamines. The wearing of a hat when outside was also recommended. If the pterygia was visually significant the patient was then referred to the local ophthalmologist for further treatment. All records were collected at the end of the week and reviewed retrospectively. Any patients that presented with a pterygia were categorized by age, gender and pterygia grade. The data was then analyzed to determine the prevalence of pterygia in Hampshire, Guyana.

## **Results**

Of the over 1,100 patients given exams in Hampshire, Guyana, 243 people had pterygia (22%). Females generally showed higher incidences of pterygia across all age groups except the 26-30, 56-60, and 66-70 groups (see Table 1). Most of the pterygia ranged from 1+ to 2+ (89%). There were 146 (37.2%) 1-2+ pterygia in males and 204 (51.9%) 1-2+ pterygia in females, while there was only 16 (4.1%) 3-4+ pterygia in males and 27 (6.9%) 3-4+ pterygia in females (see Table 2).

## **Discussion**

After analyzing all of the data, there are three significant findings. One significant finding is the high overall prevalence of pterygia in the population of Hampshire, Guyana. The second significant finding is pterygia were more prevalent in women than men in this population.



And last the most common age range for patients to present with pterygia was 31 to 60.

Overall, 22% of patients that were screened at the clinic presented with a pterygia. These results correlate with data from previous studies mentioned in the introduction. The reason for this is most likely related to the geographic location of Guyana. Ultraviolet (UV) B light exposure is considered the number one risk factor for the development of pterygia.<sup>4</sup> It is thought that UV B light may cause medial limbal cell changes in the cornea.<sup>4</sup> According to the World Health Organization, the closer you are to the equator the higher the levels of UV radiation you are exposed to.<sup>5</sup> The country of Guyana is located about 5 degrees north of the equator, and at this latitude the people are exposed to high levels of UV B light. Studies have found that people living within 30 degrees of the equator early in life are 40 times more at risk than people living outside of this range.<sup>6</sup> Also the same study found that people who spent the majority of their early lives outdoors had a 20-fold increase in pterygia development.<sup>6</sup> The people of Hampshire spend a lot of time outdoors, it is a rural population, and a lot of the people work in the sugarcane fields. When working in the fields workers are exposed to direct sunlight for the majority of the day. Also, from direct observation of the patients presenting to the clinic it was determined that many of the people of Guyana do not wear sun protection, such as UV blocking sunglasses and hats. It is because of these factors that pterygia are highly prevalent.

The second significant finding in the data is pterygia are more prevalent in females than males in the population of Hampshire (see Table 1). When comparing this to other studies this is not consistent. Most of them show that pterygia are more commonly found in men. According to one study they were found in men 54.8% compared to 45.2% in women.<sup>7</sup> In this particular geographical area and culture it is more common for the men to work outside in the fields, so men would be expected to be at more risk for developing pterygia due to increased exposure to

risk factors. It is also possible that due to the fact that our screening times were during the day, it was more convenient for women to attend. Or the clinic might have just been more attractive to women. It is hard to determine exactly why more women presented to the clinic with pterygia than men.

The final significant finding is pterygia are most commonly found in patients between the ages of 31 and 60 (see Table 1). This data is consistent with what is expected. Studies show that the mean age of presentation is 41.76 years with a 10.89 year standard deviation.<sup>7</sup> Also, another study looked at the prevalence of pterygia in Southern Ethiopia, and found that subjects above the age of 40 had a prevalence of 17.4%.<sup>8</sup> All other subjects had a prevalence of 8.8%.<sup>8</sup> Both of these studies show that pterygia develop, more commonly, later in life. This could be directly related to the risk factor that long term UV B light exposure results in pterygia. So you would not expect to see them in a young patient who has not been exposed to as much UV B light. The reason they were not observed as much in the older population is because most of the patients who presented to the clinic were under the age of 60, and the life expectancy in Guyana is 62.93 years for males and 70.74 years for females.<sup>9</sup>

After retrospectively analyzing all of the data, most of the findings are consistent with other studies looking at pterygia in similar geographic areas. Of the 1,100 patients examined in Hampshire, pterygia were found to be highly prevalent, more commonly found in women, and on average presented around middle age.

## References

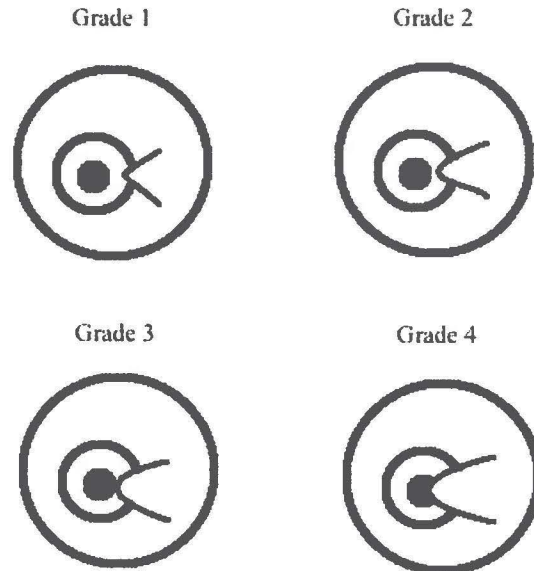
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## Figure 1

### Grading Of Pterygia:

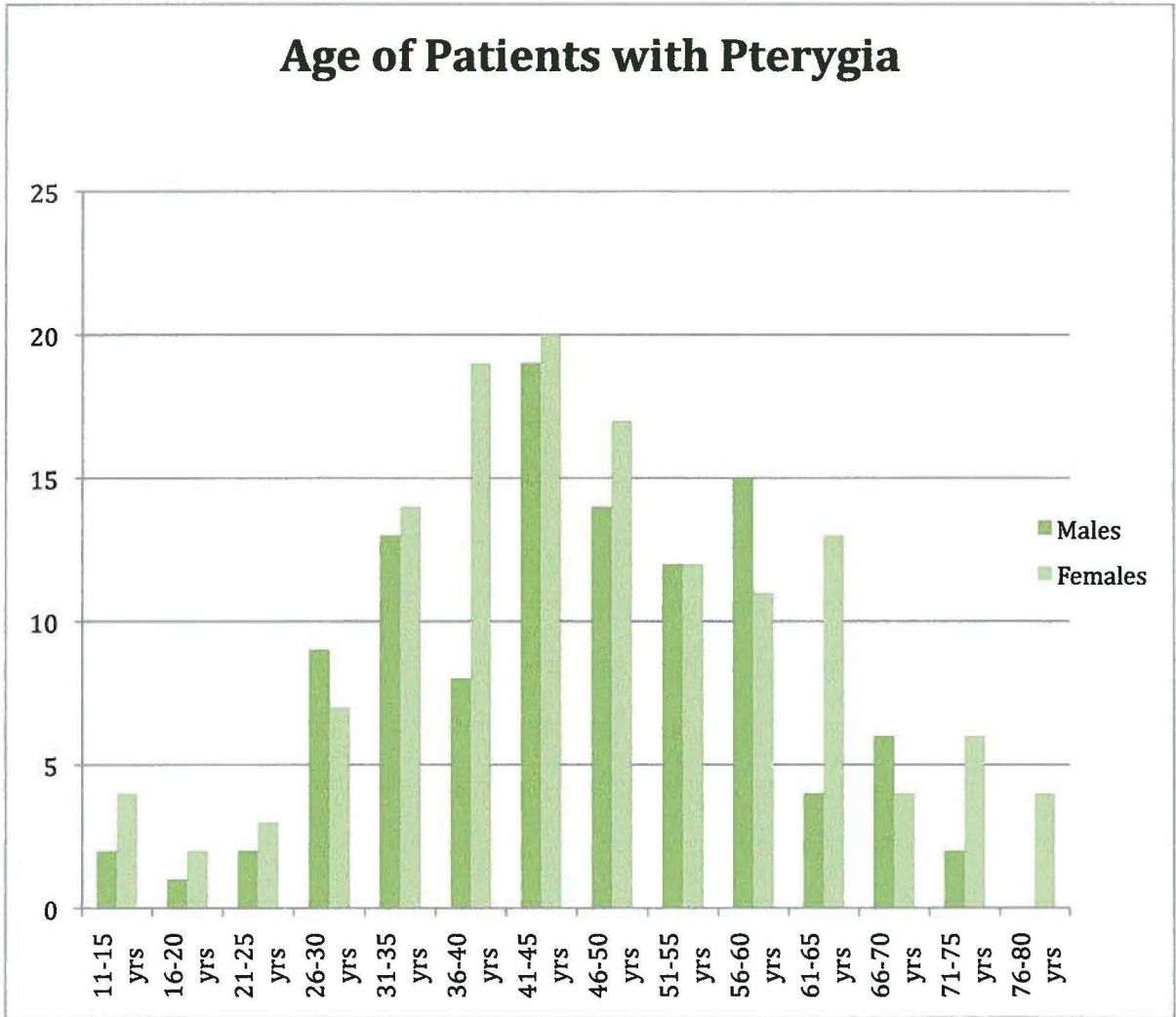
#### Four grades

- I: head of pterygium at the corneal limbus,
- II: head of pterygium between the limbus and the dilated pupil margin
- III: head of pterygium at the pupil margin,
- IV: head of pterygium within the pupil margin



**Table 1-Age of Patients with Pterygia**

Age	Male	Female
11-15yrs	2	4
16-20yrs	1	2
21-25yrs	2	3
26-30yrs	9	7
31-35yrs	13	14
36-40yrs	8	19
41-45yrs	19	20
46-50yrs	14	17
51-55yrs	12	12
56-60yrs	15	11
61-65yrs	4	13
66-70yrs	6	4
71-75yrs	2	6
76-80yrs	0	4



**Table 2- Grade of the <sup>7</sup> Patient's Pterygia**

Grade	Male	Female
1+	83	103
2+	63	101
3+	14	19
4+	2	8

# Grade of the Patient's Pterygia

