

# Prevalence of Pterygium in a Rural community of Meskan District, Southern Ethiopia

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## Abstract

**Background:** Pterygium is principally prevalent in tropical Africa. Though Ethiopia is located in the tropics, the prevalence of pterygium has not been well studied previously.

**Aim:** To determine the prevalence of pterygium among people older than 20 years and its association with age, sex, smoking and exposure to ultraviolet light (UVL) in Meskan District of Gurage zone, Southern Ethiopia.

**Methods:** This cross-sectional study was conducted from March 15 to May 15, 2006. Two peasant associations (PA) were randomly selected from the total of 42 in the district. Based on the sampling fraction, every third household in the selected peasant associations was included in the study. All individuals above 20 years of age in the selected households were interviewed and examined for the presence of pterygium. Measurements of pterygium were made with ruler. Visual acuity was taken for those individuals with pterygium and checked with pinhole if found to be less than 6/18.

**Results:** A total of 922 individuals, 400 (43.4%) males and 522 (56.6%) females, were involved in the study. The mean age was 38.2 ranging from 21-95 years. Pterygium was found in 81 (8.8%, 95% CI: 7.0,10.6) of the study subjects. For those individuals whose age was above 40 years, the prevalence was found to be 17.4% indicating an increased risk with age ( $p < 0.001$ ). It also occurred among 50 (12.5%) males and 31 (5.9%) females and the difference was statistically significant ( $p < 0.001$ ). Males have about twice the risk of developing pterygium compared to females.

**Conclusion:** The prevalence of pterygium obtained (8.8%) from this study was relatively low compared to many other reports from tropical areas. However, in agreement with other reports, advancing age and males have been identified as risk factors for the development of pterygium. Pterygium was associated with visual impairment in 13.1% of cases. [*Ethiop.J.Health Dev.* 2008;22(2):191-194]

## Introduction

Pterygium is a horizontally oriented triangular growth of abnormal tissue that invades the cornea from the canthal region of bulbar conjunctiva. Symptoms of burning, irritation, lacrimation and foreign body sensation may accompany the growth of pterygium over the cornea. Significant astigmatism may be induced as sectoral corneal steepening occurs. A study done in Doumen-county, China, showed that 1% of patients with pterygium had visual impairment ( $VA < 6/18$ ) (1)

There is a worldwide distribution of pterygium, but it is more common in a warm and dry climate (2). The prevalence is as high as 22% in equatorial areas and less than 2% in areas above 40° latitudes (3). The prevalence of pterygium varies widely among different tropical areas. Prevalence rate of 17% was reported among residents of a tropical island of Indonesia (4) and similarly 15% prevalence rate was reported from Papua New Guinea (5). Another study reported a 7% prevalence rate, which is low, among people of age 40 years and older in Singapore; an island located one degree north of equator (6).

There is strong association between sunlight exposure and pterygium formation (6-8). Researches also have identified higher percentage of risk for those who never wear eyeglasses and hat (9). Smoking is also identified as one of the risk factors for pterygium development (6). Pterygium is rare before the age of 15 years. The

prevalence of the lesion increases with age (10, 11). Males are at much higher risk than females but when we consider only indoor workers the difference between the two sexes was eliminated (4, 6, 11)

Since Ethiopia lies between 3-15° North and 33-48° East and enjoys an equatorial climate, the prevalence of pterygium is expected to be high. However, its prevalence has not been previously documented. As a result, this study was conducted to determine the prevalence of pterygium and its visual impact among people older than 20 years in a rural community of Meskan district and to see its association with age, sex, smoking and UV light exposure as risk factors.

## Methods

This cross sectional study was conducted in a community of Meskan district from March 15 to May 15, 2006. Meskan district is found in Gurage zone of the Southern Nations, Nationalities and People Regional state (SNNPR), 135 kms southwest of Addis Ababa. The estimated area coverage of the district is 59, 700 hectares and it lies between 1840m in the lowlands and 3200m in mountainous areas above sea level. The average annual rainfall is 25.9mm and the temperature ranges between 10.3 and 24°C. The district has 42 peasant associations (PAs) and a population of 183,331. There is one secondary eye unit run by non-governmental organization.

To determine the sample size, the prevalence of pterygium in the equatorial region for individuals aged above 20 years was taken to be 22.0% as reported previously (2). We also assumed a precision of 4%, a confidence interval of 95%, and a response rate of 90%. These assumptions led to a sample size of 908. Ethical approval was obtained from the research and publication committee of the Department of Ophthalmology of Addis Ababa University. Each study subject was informed about the objective of the study and verbal consent was obtained before the interview and examination.

Two peasant associations were selected for the study by using a lottery method. Individuals above the age of 20 years were included. According to the latest census in the southern region of Ethiopia, the average number of people in each household who aged above 20 years was three. So, to meet the required sample size (which is 908) three hundred households were needed to be visited. To obtain the sampling fraction, the total number of households (937) in the two peasant associations as taken from the Meskan District Health Bureau was divided by 300. Based on this result, every third household of the selected PAs was included in the study. Subjects having 20 and less year's age, uncooperative, mentally or chronically ill, having phthisis bulbi and disorganized globe were excluded from the study.

The purpose of the study was initially explained to the district administrator and PAs' leaders. Two enumerators who were high school complete and were able to speak the local language were selected and trained. Questionnaire on socio-demographic characteristics and eye examination results was pre-tested on ten individuals who were not part of the study group. The principal investigator together with the two enumerators made a house to house visit. Questionnaires were filled by the enumerators. All participants were examined by the principal investigator for the presence of pterygium using a 2.5x magnifying loupe and torchlight. Patients were asked to look to different directions to examine all quadrants of the eye. Measurement was made from the limbus to the head of the pterygium using a ruler.

Pterygium was graded according to the amount of the cornea covered as outlined below (4).

Grade	Extent (mm) over the cornea.
Grade -1	0<2 mm from the limbus
Grade -2	2-4 mm from the limbus
Grade -3	> 4 mm from the limbus

For those individuals who had pterygium, visual acuity (V/A) was also measured by the principal investigator using an illiterate "E" chart in outdoor light at 6 meters. Individuals with a V/A of less than 6/18 were rechecked with pinhole and if improved both were recorded. Study subjects who were found to have pterygium were given

advice to wear spectacles, a hat or use an umbrella, and those who need surgery were referred to the local eye facility. Individuals who were found to have conjunctivitis and active trachoma were treated with 1% Tetracycline eye ointment and health education was given as well. Other conditions which need further management in an eye care center were also referred.

Proportions, 95% confidence intervals and relative risks were analyzed through SPSS 11.0 computer soft ware.

## Results

The total number of individuals included in the study was 922. Out of these, 400 (43.4%) were males and 522 (56.6%) were females as shown in Table 1. The mean age was 38.2 years, ranging from 21 to 95 years. Nine hundred sixteen (99.3%) were farmers, one was government employee and five were engaged in other different jobs. Out of 922 individuals, 14(1.5%) claimed to use spectacles of which 9 (64.3%) use sunglasses and frequency wise, only one (11.1%) use it regularly. Six hundred thirty (68.3%) individuals use hat or umbrella in outdoor. Among them, 153 (24.3%) used it regularly. Only 14 (1.5%) individuals claimed to smoke and 3 (0.3%) said that they used to smoke but not any longer.

Table 1: Age and sex distribution of the study population, Meskan district, May 2006

Age Group	Sex		Total
	Male	Female	
21-30	155 (16.8%)	204 (22.1%)	359 (38.9%)
31-40	94 (10.2%)	130 (14.1%)	224 (24.3%)
41-50	59 (6.4%)	87 (9.4%)	146 (15.8%)
51-60	54 (5.9%)	55 (6.0%)	109 (11.9%)
>60	38 (4.1%)	46 (5.0%)	84 (9.1%)
<b>Total</b>	<b>400 (43.4%)</b>	<b>522 (56.6%)</b>	<b>922 (100%)</b>

Overall, pterygium was found in 81 (8.8%) of the individuals while it occurred in 59 (17.4%) of subjects aged above 40 years (n=339). Unilateral pterygium was found in 47 (58.0%) cases and bilateral in 34 (42.0%) cases. Isolated nasal and temporal pterygia were found in 92% and 4.5% of the cases respectively. Combined nasal and temporal pterygia were seen in 3.5% of the cases. Both eyes were equally affected. Most pterygium, 90.7%, were grade one, 8.4% were grade two and only one (0.9%) was grade three. From the total eyes with pterygium, 13.1% had V/A of less than 6/18 of whom 46.7% showed two-lines improvement with pinhole.

The mean age of individuals with pterygium was found to be 49.2 years, ranging from 22 to 95 years. There is an increased risk of pterygium with advancing age as shown in Table 2 (p<0.001). Table 3 shows the distribution of pterygium with sex. Out of the total 400 males, 50(12.5%) had pterygium whereas 31(5.9%) of 522 females were found to have it. The prevalence of

pterygium among males compared to females was 2:1, ie, males had twice the risk of developing pterygium. The difference in the prevalence of pterygium between the two sexes is statistically significant ( $p < 0.001$ ).

**Table 2: Age distribution of Pterygium, Meskan district, May 2006**

Age Group	Total Population	Prevalence of pterygium	95% CI
21-30	359	8 (2.2%)	0.7, 3.7
31-40	224	14 (6.2%)	3.1, 9.5
41-50	146	24 (16.4%)	10.4, 22.4
51-60	109	20 (18.3%)	11.0, 25.6
>60	84	15 (17.9%)	9.7, 26.1
<b>Total</b>	<b>922</b>	<b>81 (8.8%)</b>	<b>7.0, 10.6</b>

The prevalence of pterygium among individuals who did not wear eye glasses was 8.4%. It was higher (35.7%) among those who did wear eye glasses indicating an inverse relationship when the protective effect of glasses is considered ( $p < 0.001$ ). The same relationship was found in the prevalence of pterygium and the use of hat or umbrella. Non-users of hat or umbrella had pterygium in 5.8%, but, 7.1% of those individuals who do use either hat or umbrella occasionally had it. Pterygium was found in 19.6% of subjects who use either of them regularly ( $p < 0.001$ ). Among the total non-smokers, 8.6% had pterygium as opposed to the smokers who had pterygium in 21.4% of them ( $p > 0.05$ ).

**Table 3: Sex distribution of Pterygium, Meskan district, May 2006**

Sex	Total Population	Prevalence of pterygium	95% CI confidence interval
Male	400	50 (12.5%)	9.3, 15.7
Female	522	31 (5.9%)	3.9, 7.9
<b>Total</b>	<b>922</b>	<b>81 (8.8%)</b>	<b>7.0, 10.6</b>

## Discussion

This cross sectional study has showed the overall pterygium prevalence of 8.8% and of 17.4% in subjects above 40 years. This finding is slightly lower than a study done in Doumen-county, the rural area of southern China, which was 33.01% in subjects aged 50 years and above (1). In other similar study conducted on residents of a tropical island in Indonesia, the overall prevalence rate of pterygium was found to be 17% (4), higher than (8.8%) found in Meskan district which is also located in tropical region. Overall pterygium prevalence rate of 15% was also reported from Papua New Guinea.

Pterygium was established on the nasal side in 92% cases and on the nasal and temporal sides in 3.5% cases. Isolated temporal pterygium was found in 4.5% cases. Similar nasal side pterygium percentages have been reported from studies done at Doumen County (93.3%) and Douala General Hospital (93.7%) in China (1,9). Another study done on Arab patients also revealed that

temporal pterygium constituted 2.4% of the total and isolated temporal pterygium was found only in one case (0.08%) (12). In a study done at Douala General Hospital, bilateral pterygium was reported in 31.7% cases (9). This is comparable with the findings of our study, which is 42%. But a much higher result (71.6%) of bilateral cases was found in residents of tropical island of Indonesia (4).

In a study done in China, 0.9% of the eyes had visual acuity of less than 0.3, which were directly caused by pterygium (1). In this study, from the total eyes with pterygium, 13.1% had V/A of less than 6/18 and among those only 46.7% showed two lines improvement. Nevertheless, it is difficult to categorize all cases with visual impairment ( $VA < 6/18$ ) to be caused by pterygium, as there are many factors that should be considered and this is beyond the scope of our study. Previous studies identified age as a risk factor for the development of pterygium (4, 7). In consistent with these reports, our study also showed a positive association between prevalence of pterygium and age of subjects. The mean age of individuals with pterygium was 49.3 years and this finding was in agreement with other studies, which reported mean ages of 42.9 and 41.8 (4,9).

The study revealed positive association between prevalence of pterygium and wearing of sunglasses and hat or using umbrella (Though umbrella was not included in other studies, it is used here since it is unusual in our country to wear hats for the females). This finding is in contradiction with a study that revealed a nine-fold pterygium risk for those without a history of wearing sunglasses and a two-fold risk for those who never use hat (9). Because individuals with pterygium usually have irritated eyes, they are photophobic and are forced to use sunglasses, hat or umbrella regularly which might be the cause for the discrepancy in the results. In addition, the number of study subjects who used spectacles (1.5%) was too small to make a meaningful comparison and conclusion.

The study done in Singapore identified smoking as one of the risk factors (6). In our study, the number of smokers was small to make any conclusive statement. In addition, cross sectional study is incapable of identifying risk factors. We did not consider the design effect in calculating sample size. Since more than one subject was taken from each household, this might have introduced a cluster effect which might have been reflected in the findings of the study. In conclusion, this study showed an overall prevalence of pterygium to be 8.8%, which is relatively low as compared to many other tropical areas. Age and sex have been identified as risk factors for the development of pterygium. In addition, 13.1% of the cases with pterygium had an associated visual impairment.

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