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The prevalence of pterygium in Ankara: a hospital-based study

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Aim: The prevalence of pterygium in a hospital-based population was analyzed in Ankara, in central Turkey.

Materials and methods: This was a retrospective, nonrandomized, and consecutive case study. The medical records of 6470 consecutive patients aged 40 and above who attended the general ophthalmology clinic during a 12-month period from May 2008 to May 2009 were evaluated for the presence of pterygium.

Results: The overall prevalence of pterygium was found to be 3.0 % (95% confidence interval (CI): 1.9 to 3.8). It was 3.2% (95% CI: 1.9 to 4.5) and 2.8% (95% CI: 1.4 to 4.5) in men and women, respectively ($P > 0.05$). A significant increase was noticed in the prevalence of pterygium in both sexes over the ages of 60 years ($P < 0.05$).

Conclusion: The overall prevalence rate of pterygium in Ankara is low when compared with results reported from other areas of the world.

Key words: Pterygium, prevalence, hospital-based, Ankara, Turkey

Introduction

Pterygium is a wing-shaped, proliferative, and invasive extraocular lesion located most commonly in the nasal part of the limbus extending onto the cornea. Pterygium may cause discomfort, tearing, foreign body sensation, or visual impairment in advanced stages due to induced astigmatism or obscuration of the visual axis. The exact etiology and pathogenesis of this common and potentially blinding disease still remains unclear. Ultraviolet (UV) type B (UVB) light in solar radiation has been accepted as a risk factor for the development of pterygium. Over the past years, several population-based studies have shown higher rates of pterygium in countries nearer the Equator (1-6). These rates have been linked to excessive UV exposure that induces oxidative stress and expression of cytokines and growth factors in pterygial epithelial cells, which initiates cellular proliferation, blood vessel formation, tissue invasion, and inflammation (6-10). UV radiation triggers a chain of events that cause damage to cellular DNA, RNA, and the extracellular matrix (11). Several studies demonstrated elevated levels of vascular endothelial growth factor (VEGF), basic fibroblast growth factor (bFGF), and tumor growth factor (TGF)-β, and decreased levels of angiogenic inhibitor pigment epithelium derived factor (PEGF), catalase (CAT), superoxide dismutase (SOD), and glutathione peroxidase in the pterygium tissue (6-10). Recent reports have also reported an association of pterygium with dry, warm, and dusty climates, and high winds and genetic predisposition (4,11).

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Numerous studies have demonstrated the prevalence of pterygium in various populations with different rates ranging from 0.3% to 33.1% according to the location, altitude, and race (13-18). In this study we aimed to assess the prevalence of pterygium in Ankara in central Turkey, where data on the prevalence of pterygium has not been previously available.

Materials and methods

This investigation, a hospital-based, retrospective study, took place at Sincan State Hospital in Ankara, which serves a population of approximately 200,000. The study was conducted in compliance with the institutional and government review board regulations, informed consent regulations, and the Declaration of Helsinki.

Ankara (39°57′N, 32°54′E) is located in the central region of Turkey. The average altitude of Ankara is 850 m above sea level, with a land area of 30.715 km^2 and a population of 4,007,860 people. Ankara has a continental climate with an annual mean temperature of 11.7 °C. In January the mean temperature is –0.1 °C; in July, it is 21.1 °C. The mean annual relative humidity is 60%.

Data were collected from the medical records of consecutive patients who attended the general ophthalmology clinic at Sincan State Hospital during a 12-month period from May 2008 to May 2009. All patients aged 40 and older were candidates. There were 6470 patients who participated in the study. All patients underwent a complete ophthalmological examination. Diagnosis of pterygium was made by the same ophthalmologist (M.Ş.) using a slit-lamp biomicroscopy.

Statistical analysis was performed using SPSS version 12.0 with significance attributed to $P < 0.05$. The prevalence rates and 95% confidence intervals (CIs) of pterygium for patients were calculated. The association between age, sex, and other variables was estimated by the odds ratio (OR) and its 95% CI.

Results

A total of 6470 patients with a mean age of 57.2 ± 10.1 years (age range: 40-83 years) participated in this study. There were 2974 men (45.9%) and 3496 women (54.1%). A total of 196 patients had pterygium or a history of pterygium surgery, giving an overall prevalence rate of 3.0% (95% CI: 1.9 to 3.8). There was no significant difference in the rates of pterygium by side: right, 4.1% (95% CI: 2.2 to 6.2); left, 3.9% (95% CI: 0.6 to 7.2); $P > 0.05$. The rates for men and women were 3.2% (95% CI: 1.9 to 4.5) and 2.8% (95% CI: 1.4 to 4.5), respectively, also demonstrating no statistically significant difference ($P > 0.05$). The prevalence significantly increased by age in both sexes after age of 60 ($P < 0.05$). The age- and sex-specific prevalence rates of pterygium are shown in the Table.

Discussion

Previously reported prevalence rates of pterygium show considerable variation, ranging from 0.3% to 33.1% depending on factors like age, sex, race, and geography (1-5,11-17). In this study the results demonstrate a low rate of prevalence: the overall prevalence of pterygium was 3.0% (95% CI: 1.9 to 3.8) in Ankara.

Table. Pterygium prevalence rates in Ankara, in central Turkey, according to age and sex.

Age (years)	Men		Women		Men and Women	
	No.	Prevalence rates (95% CI)	No.	Prevalence rates (95% CI)	No.	Prevalence rates (95% CI)
40-49	950	2.5 (0.1-5.1)	1325	2.6 (1.8-3.4)	2275	2.5 (0.0-5.9)
50-59	867	2.2 (1.0-3.2)	1023	2.3 (0.9-3.1)	1890	2.2 (0.0-3.4)
60-69	663	3.9 (1.5-6.4)	886	3.3 (2.3-4.4)	1549	3.6 (0.3-7.3)
70+	494	5.9 (2.3-9.6)	262	5.0 (2.7-6.9)	756	5.5 (2.2-8.4)
Total	2974	3.2 (1.9-4.5)	3496	2.8 (1.4-4.5)	6470	3.0 (1.9-3.8)

There are a few comparable studies showing low prevalence rates of pterygium. In such studies, the prevalence rates were 1.3% in Tehran (15), 1% in Kyoto (19), 2.83% in Victoria (20), and 2.88% in Beijing (17). In the Tehran Eye Study, according to ethnicity, Turkish subjects had a prevalence rate of 2.7%, similar to our result (15). As Tehran and Ankara are located close to each other, this may reflect the effects of racial and geographical factors on the etiology of pterygium.

Recent reports demonstrated a relationship between UVB light and pterygium (1,2,7,10,12). It was seen that the populations living at high altitudes (above 3000 m) were exposed to high UVB sunlight and had high prevalence rates of pterygium. In an aged Mongolian population living in Henan County, where the average altitude was 3450 m, the prevalence of pterygium was 17.0% (18). In Zeku County, China, with an average altitude of 3700 m, the prevalence of pterygium was 14.49% (14). The altitude of our study location was 850 m, which is relatively low. This could be one of the factors that might explain the low prevalence of pterygium in Ankara.

Several studies reported a positive association between increasing age and the presence of pterygium. A study of a tropical island in the Riau Archipelago, Indonesia, demonstrated a significantly higher average age of subjects with pterygium (42.8 years) compared to those without (18.6 years) (13). In Victoria, Australia, the prevalence of pterygium increased from 2.83% in persons aged 40 years to 6.45% among those aged 80-89 years (20). A similar trend was reported in the Central Sahara in Africa, with prevalence increasing from 1.1% in subjects aged 2-19 years to 13.0% in subjects aged 40-87 years (21). In Spain the prevalence of pterygium was reported as 5.9% and this increased significantly with age (22). In this study, we also demonstrated an increase in the prevalence of pterygium with increasing age. We found that the prevalence of pterygium was 2.54% in those aged 40-49, but 5.67% for those above 70 years.

In contrast with the male predominance found in many other studies of pterygium, the prevalence was similar between sexes in our study. Similar results were found by Lu et al. in China (18), Viso et al. in Spain (22), Gazzard et al. in Indonesia (23), Forsius et al. in Rwanda (24), and Luthra et al. in Barbados (25).

To the best of our knowledge, this was the first study to examine the prevalence of pterygium in a Turkish population in central Turkey. Despite excluding young patients and screening patients above 40 years old, in the selected population we found a low prevalence rate of pterygium in Ankara. Our study has some limitations. First, it is a hospital-based prevalence study that involves a highly selected population from the ophthalmology clinic. All patients were selected from the same clinic population. Second, as it was a retrospective study, we were not able to evaluate the grade of the pterygium or risk factors such as the occupation of the patients, history of smoking, presence of any systemic or ocular disease, or exposure to sunlight. However, all patients were examined by the same ophthalmologist, minimizing interobserver error, which strengthens the survey. Third, our study lacks a statistical power analysis. As a statistical power analysis needs an approximate prevalence of pterygium in the same population and the prevalence of pterygium in our population has not yet been studied, we were not able to do a statistical power analysis in the present study.

In conclusion, our study demonstrates the prevalence of pterygium according to age and sex in a Turkish population in Ankara, in central Turkey. When we compare the results with reported results from other areas of the world, our study shows a lower prevalence rate of pterygium. Further cross-sectional population-based studies are suggested to monitor the prevalence of pterygium in Turkey.

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