



Research Article

Prevalence of Diabetes Mellitus in Patients with Pterygium

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Objectives: The present study was designed to investigate the relationship between diabetes mellitus (DM) and pterygium in patients with pterygium excision.

Methods: The data of patients who underwent pterygium surgery in this hospital between 2012 and 2016 were retrospectively reviewed. Patients with systemic disease other than DM were excluded and 174 patients were ultimately included in the study. Age, gender, blood sugar, glycated hemoglobin levels, and diabetes duration were recorded for all patients.

Results: The mean age of the patients was 55.4 years; it was 59.6 years for those with DM and 54 years for those without DM. Of the patients, 104 (59.8%) were female and 70 (40.2%) were male. DM was present in 24.1% of the patients, of whom 64.3% were female and 35.7% were male. Of the nondiabetic patients, 58.3% were female and 41.7% were male. Although the co-existence of pterygium and DM was more common in females, the results were not statistically significant.

Conclusion: The development of pterygium may be due to many factors, as well as chronic diseases, such as DM.

Keywords: Conjunctiva, diabetes mellitus, inflammation, oxidative stress, pterygium

Pterygium is a benign lesion characterized by fibrovascular proliferation of the conjunctiva and Tenon's capsule.^[1] Advanced age, male gender, working in open area, rural life and low education level are considered as the risk factors for developing pterygium.^[2] Although the pathogenesis of pterygium remains unclear, it is reported to be associated with ultraviolet-B (UVB).^[3] UVB-related oxidative stress plays a critical role in the pathogenesis of pterygium.^[4] Type-2 diabetes mellitus (DM) is characterized by high blood glucose level and insulin resistance. Metabolic alterations in DM alter the inflammatory response of the body resulting in increased production of free oxygen radicals and impaired neutrophil function. Certain types of cancer are more common in diabetic patients.^[5]

In the present study, we hypothesized that oxidative stress

is the common ground for pterygium and diabetes. We investigated the relationship between diabetes and pterygium based on the prevalence of diabetes in patients who underwent pterygium excision.

Methods

Medical records of the patients who had undergone pterygium excision between 2012 and 2016 in our hospital were retrospectively reviewed. The study was conducted in accordance with the declaration of Helsinki and approved by the local ethics committee of the university. Patients' medical records were screened for visual acuity and the findings of anterior-posterior segment examination. Patients with systemic disease other than diabetes mellitus were excluded and finally, a total of 174 patients were en-

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rolled. Age, gender, blood glucose concentration, HbA1c concentration, and duration of DM were recorded for all patients.

The data were analyzed using the SPSS 18 program and were expressed as mean±standard deviation. Student t-test was used to compare independent samples, whereas chi-square test was used to compare the ratios. A p value <0.05 was considered statistically significant.

Results

The mean age of the patients was 55.35 ± 13 years; 59.6 ± 9.8 years for diabetic patients and 54.1 ± 4.4 years for non-diabetic patients. The mean age of diabetic males was 55.53 ± 6 years and the mean age of non-diabetic males was 56.44 ± 12 years ($p=0.067$). The mean age of non-diabetic females was 49.3 ± 5 years and the mean age of diabetic females was 58.8 ± 10 years ($p=0.036$). Of the patients who underwent pterygium excision, 104 (59.8%) were females and 70 (40.2%) were males. Diabetes mellitus was present in 24.1% of the patients, of whom 64.3% were females and 35.7% were males. Of the non-diabetic pterygium patients, 58.3% were females and 41.7% were males. Pterygium was more common among females ($p=0.017$); however, there was no significant relationship between diabetes and pterygium ($p=0.065$). The mean blood glucose concentration of the non-diabetic patients was 90 mg/dL, whereas the mean blood glucose and HbA1c concentrations of diabetic patients were 210 mg/dL and 7.4%, respectively. While the corrected visual acuity of the eye with pterygium measured by the Snellen chart before the surgery was 8/10 in non-diabetic patients, it was 6/10 in diabetics. One-line improvement was observed in the postoperative visual acuity in both groups.

Discussion

Pterygium is the abnormal proliferation and encroachment of the conjunctiva onto the cornea. Pterygium is a hypervascularized tissue with degenerative and hyperplastic changes and proliferative and inflammatory features. Although pterygium is considered a benign lesion, it also displays malignant characteristics as uncontrollable proliferation, corneal invasion, vascularization, postoperative relapses, and need for antineoplastic agents for treatment in combination with surgical intervention.

High blood glucose levels in Type 2 DM alter the production of inflammatory mediators and oxygen radicals leading to decreased immune response, delayed wound healing, inadequate response to infectious agents and proliferation of neoplastic cells. There are studies in the literature revealing the relationship between diabetes and certain types of cancer.^[6]

The studies in the literature investigating the relationship between pterygium and DM are generally from Far East and India. These are epidemiological studies on pterygium conducted in large samples and they investigated not only diabetes but also the other etiological factors. Nam et al.^[7] conducted a study in 16,234 patients from the South Korea and investigated the relationship between obesity and development of pterygium. They reported a higher prevalence of pterygium and DM in females with high body mass index and increased waist circumference. Zong et al.^[8] conducted a study in 2,133 Chinese patients and found the prevalence of pterygium to be higher in females and elderly, however, they failed to demonstrate a relationship between pterygium and chronic diseases such as diabetes, hypertension and obesity. Asokan et al.^[9] conducted a study in the South India on 7,774 patients with pterygium and pinguecula; they assessed the risk factors in the patients living in rural and urban settings and found the prevalence of pterygium and pinguecula to be higher among those living in the rural area. However, they found no relationship with diabetes, hypertension, smoking and alcohol consumption. Marmamula et al.^[10] conducted a study in 5,586 patients from India; they failed to demonstrate a relationship between pterygium and gender, smoking and diabetes; however, they found that long-term exposure to sun was associated with the increased incidence of pterygium.

West et al.^[11] conducted a study in 4,774 Latin patients from the United States and different from the literature, demonstrated that diabetes and smoking had protective effects against pterygium. They explained the effect of smoking on pterygium with its antiestrogenic effect and its association with some autoimmune diseases, whereas the effect of diabetes on pterygium development was attributed to the fact that diabetic patients did not work in open area. In the present study, both the prevalence of diabetes and pterygium were higher among females, though there was no significant relationship between diabetes and pterygium.

Conclusion

Many factors are blamed for the etiology of pterygium; however, none can explain the development or the recurrence of pterygium. As the eye is an organ influenced by the metabolic events in the body, effect of diabetes mellitus on pterygium can be investigated.

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Disclosures

Ethics Committee Approval: The study was approved by the Local Ethics Committee.

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References

1. Coster D. Pterygium—an ophthalmic enigma. *Br J Ophthalmol* 1995;79:304–5. [\[CrossRef\]](#)
2. Nemesure B, Wu SY, Hennis A, Leske MC; Barbados Eye Studies Group. Nine-year incidence and risk factors for pterygium in the barbados eye studies. *Ophthalmology* 2008;115:2153–8.
3. Bradley JC, Yang W, Bradley RH, Reid TW, Schwab IR. The science of pterygia. *Br J Ophthalmol* 2010;94:815–20. [\[CrossRef\]](#)
4. Perra MT, Maxia C, Corbu A, Minerba L, Demurtas P, Colombari R, et al. Oxidative stress in pterygium: relationship between p53 and 8-hydroxydeoxyguanosine. *Mol Vis* 2006;12:1136–42.
5. Alba-Loureiro TC, Munhoz CD, Martins JO, Cerchiaro GA, Scavone C, Curi R, et al. Neutrophil function and metabolism in individuals with diabetes mellitus. *Braz J Med Biol Res* 2007;40:1037–44. [\[CrossRef\]](#)
6. Onitilo AA, Engel JM, Glurich I, Stankowski RV, Williams GM, Doi SA. Diabetes and cancer I: risk, survival, and implications for screening. *Cancer Causes Control* 2012;23:967–81. [\[CrossRef\]](#)
7. Nam EG, Kim S, Paik JS, Kim HS, Na KS. Association between pterygium and obesity status in a South Korean population. *Medicine (Baltimore)* 2016;95:e5664. [\[CrossRef\]](#)
8. Zhong H, Cha X, Wei T, Lin X, Li X, Li J, et al. Prevalence of and risk factors for pterygium in rural adult chinese populations of the Bai nationality in Dali: the Yunnan Minority Eye Study. *Invest Ophthalmol Vis Sci* 2012;53:6617–21. [\[CrossRef\]](#)
9. Asokan R, Venkatasubbu RS, Velumuri L, Lingam V, George R. Prevalence and associated factors for pterygium and pinguecula in a South Indian population. *Ophthalmic Physiol Opt* 2012;32:39–44. [\[CrossRef\]](#)
10. Marmamula S, Khanna RC, Rao GN. Population-based assessment of prevalence and risk factors for pterygium in the South Indian state of Andhra Pradesh: the Andhra Pradesh Eye Disease Study. *Invest Ophthalmol Vis Sci* 2013;54:5359–66.
11. West S, Muñoz B. Prevalence of pterygium in Latinos: Proyecto VER. *Br J Ophthalmol* 2009;93:1287–90. [\[CrossRef\]](#)