

Corneal Thickness in Pseudoexfoliative Glaucoma

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ABSTRACT

Measurements of central cornea thickness (CCT) have a very important value in glaucoma patients; if the central cornea is thinner than it suggests, then the intraocular pressure is falsely low. This study compares the central cornea thickness between patients with pseudoexfoliative glaucoma, open angle glaucoma, angle closure glaucoma and control group. This study included 34 patients with pseudoexfoliative glaucoma, 31 patient with open angle glaucoma, 28 patients with angle closure glaucoma and 36 normal subjects in a control group. Patients in all groups and also normal subjects in control group had no other corneal disorders, no history of trauma, corneal surgery and were not patients with contacts lens use. Patients with pseudoexfoliative glaucoma and also patients with open angle glaucoma had significantly lower values of central cornea thickness compared with normal subjects in control group. Tomey EM 3000 is a non contact specular microscope which was used to measure central corneal thickness in this study. Pachymetry is an important method for diagnoses of glaucoma and for examination of the intraocular pressure in glaucoma patients, because values of the central corneal thickness affect the exact intraocular pressure readings.

Key words: pseudoexfoliative glaucoma, corneal thickness, pachymetry

Introduction

Pseudoexfoliation glaucoma is a form of glaucoma that can develop in patients afflicted with pseudoexfoliation syndrome. Pseudoexfoliation syndrome describes the grayish-white deposits of abnormal proteins on all surfaces of the eye irrigated by the aqueous humor; this material is most easily visible on the anterior surface of the lens. There are also deposits of Pex material inside the trabecular meshwork which is an age-related phenomenon of the body's fibrils that can develop in other organs as well and may lead to various eye alterations¹.

Corneal pachymetry is the process of measuring corneal thickness using either contact methods such as ultrasound or non-contact optical methods. With the specular microscope we can measure the central corneal thickness by optical method². The thickness of cornea influences eye pressure measurements. A difference in central corneal thickness (CCT) of 0.07 mm from the normal of 0.52 mm was found to cause an over underestimation of IOP by 5 mmHg. Measurements of the corneal thickness may be necessary for the accurate interpretation of applanation tonometry^{3,4}.

A thinner cornea may require less force to bend it, leading to underestimation of the true intraocular pressure, while a thicker cornea would need more force to bend it, thus giving an artificially higher intraocular pressure reading⁵.

Patients and Methods

Central corneal thicknesses in groups of patients with glaucoma (pseudoexfoliative glaucoma, open angle glaucoma, angle closure glaucoma) were compared with central corneal thickness in control group of normal subjects.

In the pseudoexfoliative glaucoma group there have been 34 patients (20 male, 14 female) between 50–65 years of age. In the open angle glaucoma group there have been 31 patients (14 male, 17 female) between 50–65 years of age. In the angle closure glaucoma group there have been 28 patients (14 male, 14 female) between 50–65 years of age. In the control group of normal sub-

jects (20 male, 16 female) there have been 36 patients in the same age.

All of the patients were examined at the Department of Ophthalmology, Rijeka University Hospital. Pachymetry was performed by a non contact specular microscope Tomey EM 3000 and we measured the central corneal thickness.

Excluding criteria in all groups were other corneal disorders, history of trauma, contact lens use and corneal surgery.

Results and Discussion

In pseudoexfoliative glaucoma group, the central cornea thickness was 497 ± 25 micrometers. In open angle glaucoma group, the central cornea thickness was 512 ± 30 micrometers. In angle closure glaucoma group, the cen-

tral cornea thickness was 535 ± 29 micrometers. In control group the central corneal thickness was 545 ± 32 .

Pachymetry values are significantly lower in the pseudoexfoliation glaucoma group and in the open glaucoma group compared with the control group. There was no significant difference in the central corneal thickness between the angle closure glaucoma group and the control group.

Conclusion

Because of the thinner central cornea thickness in patients with pseudoexfoliation glaucoma and patients with open angle glaucoma, results can be different in the sense of underestimation of the intraocular pressure.

This study suggests the need for combined measurement of intraocular pressure and the central corneal thickness for the exact intraocular pressure readings.

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DEBLJINA ROŽNICE KOD PSEUDOEKSFOLIJATIVNOG GLAUKOMA

SAŽETAK

Mjerenje debljine centralne rožnice je vrlo važan podatak u praćenju odnosno dijagnosticiranju glaukomske bolesti, jer ovisno o debljini rožnice imamo točan podatak vrijednosti očnog tlaka. U studiju su bili uključeni pacijenti podijeljeni u slijedeće grupe: 34 pacijenta s pseudoeksfolijativnim glaukomom, 31 pacijent s glaukomom otvorenog kuta, 28 pacijenata s glaukomom zatvorenog kuta i 36 osoba (oftalmološki zdravi) u kontrolnoj skupini. U svim skupinama pacijenata isključeni su bili pacijenti koji bi osim glaukomske bolesti imali neku drugu bolest rožnice, zatim traumu oka, refraktivnu operaciju oka i osobe koje su korisnici kontaktnih leća. Mjerenjem debljine rožnice ustanovili smo da pacijenti s pseudoeksfolijativnim glaukomom i pacijenti s glaukomom otvorenog kuta imaju značajno tanju debljinu centralne rožnice od osoba u kontrolnoj skupini. Ispitivanje je učinjeno na spekularnom mikroskopu Tomey EM 3000, kao nekontaktna metoda mjerenja debljine rožnice. Pahimetrija je važna u dijagnosticiranju glaukomske bolesti kao i u praćenju glaukomskih pacijenata zbog točnih podataka o reguliranosti visine očnog tlaka.