Original Article

Central Corneal Thickness in Myopia: A Cross-sectional Study

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Abstract

Purpose: This study aims to determine the relationship between central corneal thickness (CCT) and myopia.

Meterials and Method: This is a institution-based cross-sectional study. CCT of 45 myopic patients was measured using ultrasound A-scan pachymeter. CCT was correlated with myopia using Karl Pearson's correlation coefficient.

Result: 45 patients were recruited for this study. Age of patients ranged from 18 to 75 years, with a mean of 46.50 years. Myopia ranged from −0.25d to −13.00d with a mean of 6.62D. The mean CCT was 543.54 microns. Pearson correlation coefficient was CCT and myopia: $r = 0.0363$, $P = 0.734$.

Conclusion: There was no correlation between CCT and myopia. The process by which myopia progress does not influence CCT.

Key words: CCT, Myopia, IOP

INTRODUCTION

Central corneal thickness (CCT) is an essential tool in the assessment and management of corneal disease. It is also an important indicator of corneal health status. CCT has an impact on the accuracy of intraocular pressure (IOP) measurement by applanation tonometry.[1]

Myopic changes of the eyes include elongated axial length, deeper anterior chamber, thinner retina with lattice changes and higher prevalence of retinal detachment, decreased choroid circulation, as well as decreased scleral thickness and elasticity.[1]

Changes in the anterior segment associated with myopia are still under debate. The myopic eye is known to be longer than the normal emmetropic eye. If this is the result of general growth, one might expect the cornea to have grown thicker than normal. If instead, the myopic eye is larger due to a mechanism similar to that of a balloon being inflated, one would expect the cornea to be thinner than normal according to a simple stretching theory. An emmetropic eye could then be compared to a sphere and a myopic eye to a prolate spheroid.[2]

Myopia is increasing in prevalence among the populations of East Asian origin. Estimates of the proportion of myopia in the young population of South East Asian countries range from 30% to 60%.[3]

Studies that have attempted to investigate the effect of refractive errors on CCT have reported conflicting results. Some studies have reported no correlation between corneal thickness and level of myopia,[4] whereas some studies have found the cornea to be thinner in more myopic eyes.[5]

CCT indicates corneal physiologic health and affects the measurement of IOP. A thin central cornea is a risk factor for development of glaucoma in patients with ocular hypertension.[6]

Objective

To determine the relationship between CCT and myopia among patients attending ophthalmology OPD.

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METERIALS AND METHODS

Place of Study

The study was conducted at Kannur Medical College, Department of Ophthalmology.

Study Population

45 myopic patients attending ophthalmology OPD.

Methods

CCT of 45 myopes was measured using ultrasound pachymetry (Figure 1a).

Sample Size

45 myopes (90 eyes) (Figure 1b).

Inclusion Criteria

Myopes (age 18–65 years) visiting ophthalmology OPD with power between −0.25 and −15.0 D, cylinder of 3D or less.

Patients attending ophthalmology OPD willing to give written informed consent for the study.

Exclusion Criteria

History of hypertension, glaucoma, uveitis or ocular trauma, keratoconus, eyes with suspected corneal dystrophy, known ocular pathology, or previous ocular surgery.

Type of Study

Institution-based cross-sectional study.

Data Collection Method

The CCT was measured using ultrasound A-scan Pachymeter (pac-man). Furthermore, personal details, age, sex, manifest, and cycloplegic refraction, IOP measurement was taken.

Sample Size

$$n = \frac{(Z1 - a)^2 \, ´ \, 2 \, ´ \, S^2}{d^2}$$

Sample size = 45.

Statistical Analysis

Data on continuous scale will be presented as mean ± SD. Data on categorical scale will be presented as proportion and percentage. To check for the correlation between CCT and Myopia, Karl Pearson's correlation coefficient was used. $P = 0.05$ was considered statistically significant.

RESULTS

45 patients were recruited for this study. Age of patients ranged from 18 to 75 years, with a mean of 46.50 years Table 1. Myopia ranged from −0.25d to −13.00d with a mean of 6.62D (Figure 1c). The mean CCT was 543.54
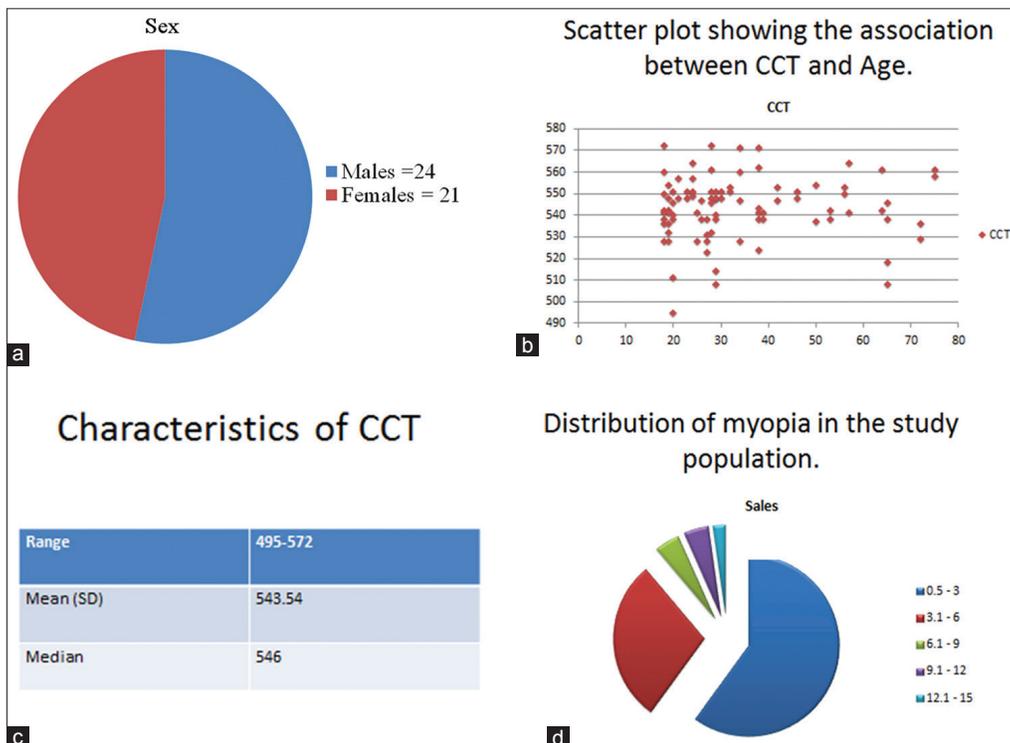
Figure 1: (a) Sex distribution (b) association between CCT and age (c) CCT characteristics (d) distribution of myopia

Table 1: Demographic features of study patients

Number of patients	45
Number of eyes	90
Age	
Range (years)	18–75
Mean±SD	34.4

microns (Figure 1d). Pearson correlation coefficient was, $r = 0.0363$ ($P = 0.734$).

DISCUSSION

This study demonstrates that CCT does not correlate with the degree of myopia. It appears that the cornea is not thinning in the same way as the sclera in myopic eyes. The mean ± SD CCT was 543.54 microns. This is comparable with similar studies. Fam *et al.*[3] in a study on 714 Chinese patients had a mean of 534.5 microns. Chang's[7] series had a mean of 533 microns, whereas Vijaya *et al.*[8] reported the mean ± SD CCT in a normal rural South Indian population to be 505.9 (31.10) microns.

This study showed no statistically significant correlation between CCT and myopia.

CONCLUSION

There was no correlation between CCT and myopia. The process by which myopia progress does not influence CCT.

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