

# UNRAVELLING THE ASSOCIATION BETWEEN MYOPIA AND CENTRAL CORNEAL THICKNESS: A TERTIARY HOSPITAL STUDY

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## ABSTRACT

**INTRODUCTON-** The prevalence of Myopia has increased manifold in the current scenario. Many studies have been done to show the relationship between Myopia and Central corneal thickness (CCT) with conflicting results. **OBJECTIVES-** The purpose of this study was to find out the relationship between central corneal thickness and Myopia. **MATERIAL AND METHODS-** This prospective cross-sectional study was conducted in a tertiary care hospital in South India between March 2021 to February 2022. One hundred Myopic individuals between age group 11 years to 40years with spherical equivalent SE ranging from -0.25 to -5Diopters after cycloplegic refraction have been included in the study. CCT was measured in both eyes of each patient using AS-OCT. The relationship between CCT and Myopia was analyzed using Pearson's Correlation Coefficient. Statistical significance was set at  $P < 0.05$ . **CONCLUSION-** There was no correlation between CCT and degree of myopia. The findings contribute to the ongoing discussion regarding structural changes in ocular coats and glaucoma susceptibility in myopia

**KEYWORDS-** central cornea thickness, myopia, cornea, spherical equivalent

**INTRODUCTION-** Myopia (short-sightedness), is considered as the most prevalent refractive error in the world. The co-relation between Myopia and Axial length has been

discussed extensively revealing a positive correlation between two. With the introduction of LASIK and its popularity, it has become important to assess Central Corneal Thickness and Corneal curvature to prevent Post-LASIK Ectasia. With the increasing prevalence of Myopia in India and conflicting evidence on the association between CCT and Myopia, we attempted to study the relationship between myopia and CCT among patients attending the refraction clinic of a tertiary care institute

#### **MATERIALS AND METHODS-**

A prospective cross sectional study was done after approval from ethical committee in a tertiary care Institution in South India. Individuals between 11 and 40 years of age with simple Myopia of refractive error more than  $-0.5$  D on cycloplegic refraction were included in the study. Informed consent was obtained from all the participants. Exclusion criteria were Myopia  $> -6$  D, Prior refractive or other ocular surgery, Contact lens wear, Trauma, Corneal diseases, Cataract, glaucoma, and ocular hypertension, Pregnant and lactating females, Individuals with systemic diseases such as diabetes mellitus, hypertension and collagen vascular disease. All Participants underwent a comprehensive ophthalmic examination using slit-lamp and fundus evaluation with  $+90$  D lens and indirect ophthalmoscopy. Cycloplegic refraction was performed and spherical equivalent was calculated. CCT was measured by a single experienced ophthalmologist using AS- OCT (NIDEK SD OCT).

**RESULTS-** This study included 200 eyes of 100 individuals with Simple Myopia attending consecutively to our Ophthalmology OPD. 54% of the study population were female (Figure 1). The mean CCT in Right eye was  $530.19 \pm 24.22$  and mean CCT in Left eye was  $524.85 \pm 24.19$  (Table 2). The mean CCT in male is  $528.09 \pm 23.21$  and that in female is  $527.03 \pm 25.28$  (Table 3). No statistically significant relationship was noted between refractive error and CCT among the study population ( $p=0.064$ ) (Table 4). The correlation between absolute value of SE and CCT was non-significant ( $p>0.5$ ).

**DISCUSSION-** Multiple studies tried to describe the relationship between the SE and the central corneal thickness. Ucakhan et al (1) in 2008 in Turkey, prospectively evaluated corneal thickness in relation to the refractive status measured with the Pentacam Scheimpflug system. They evaluated 215 patients with different types of refractive errors and found no correlation between SE and CCT ( $r = 0.149$ ,  $p$ -value  $>0.05$ ). Chen et al. in 2009(2), evaluated the relationship between CCT and degree of myopia among 528 Taiwanese adults. No statistically significant association was found between CCT and refractive error ( $P = 0.49$ ). In 2010, Nangia et al(3) evaluated CCT and its association with ocular and general parameters in Indians (the Central India Eye and Medical Study). This study included 9370 eyes of 4711 participants. According to this study, though in univariate analysis, there was a significant correlation between CCT and SE ( $r = 0.07$ ,  $p$ -value  $<0.001$ ); following multivariate analysis (including CCT, age, gender, and body mass index), CCT was no longer significantly correlated with SE ( $p$ -value = 0.54). In 2019, Mourad et al(4) concluded that CCT was significantly lower in myopic and hyperopic patients (means = 531 and 523.5, respectively) than in emmetropic people (mean = 555) in a sample of 84 eyes in Egyptian people.

**CONCLUSION-** There was no correlation between CCT and degree of myopia. The findings contribute that simple myopia does not cause any structural changes in ocular coats and glaucoma susceptibility

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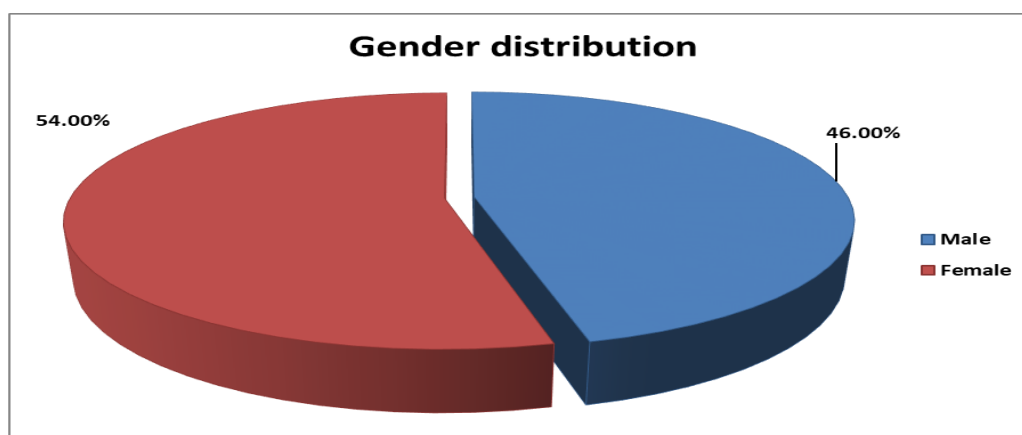


Figure 1- diagram showing gender distribution among the study population

Variable	GENDER	MEAN +- SD	MIN	MAX	T VALUE	ISSN 2515-8260 P VALUE	Volume 10, Issue 01, 2023
CCT	MALE	528.09+- 23.21	480.00	590.00	0.310		
	FEMALE	527.03+- 25.28	466.00	575.00			

Table1- Distribution of central corneal thickness (CCT) between Right Eye and Left eye and Spherical equivalent(SE) between the Right Eye and Left Eye among the study population

Variable	N	Mean $\pm$ SD	Min	Max	Range
CCT (RE)	100	530.19 $\pm$ 24.22	469	590	121.00
CCT (LE)	100	524.85 $\pm$ 24.19	466	576	110.00
SE (RE)	100	-0.88 $\pm$ 0.09	-0.75 D	-3.5 D	4.25
SE (LE)	100	-1.17 $\pm$ 0.09	-0.75 D	-4.00 D	4.75

Table2 – Distribution of CCT among the study population

Variable	Gender	Mean $\pm$ SD	Min	Max	T value	P value
SE	MALE	-0.97 $\pm$ 0.98	-0.75D	-4.00D	0.759	0.449
	FEMALE	-1.07 $\pm$ 0.95	-0.75D	-3.25D		

Table3- distribution of spherical equivalent(SE) among the study population

VARIABLE	MEAN $\pm$ SD	MIN	MAX	P VALUE
CCT vs SE	527.52 $\pm$ 24.29	466.00	590.00	0.163
	-1.03 $\pm$ 0.96	0.75D	-4.00D	

Table4- Comparison of CCT with SE among the study population