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The Correlation of Central Corneal Thickness (CCT) To Degree of Myopia and Compare It with Emmetropes

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Abstract:-

- ***Purpose:***

To find the correlation of Central Corneal Thickness(CCT) to degree of myopia and compare it with emmetropes.

- ***Method:***

Prospective study, the CCT of 50 myopic eyes from myopic patients and 50 emmetropic eyes from control group was measured using ultrasound pachymetry at Ophthalmology department, Saveetha Hospital.

- ***Result:***

The mean myopic spherical equivalent was -2.5D, range -0.75D to -4.25D. the mean CCT of emmetropic group was 577.2 micrometer and the mean CCT of myopic group was 558.54micrometer. The mean CCT between myopic and emmetropic group was statistically significant. There was correlation between CCT and degree of myopic spherical equivalent .

- ***Conclusion:***

This study showed that there was some difference in CCT between emmetropes and myopic eyes (P=0.0011). As myopic degree increases central corneal thickness decreases. (On correlation, value is -0.2039)

I. INTRODUCTION

Central corneal thickness(CCT) acts as an good indicator for health status of cornea. Change in CCT indicates different pathologies like endothelial dysfunction, Refractive error, and other systemic diseases. It is also evaluated as one of the preoperative investigations for corneal refractive surgery as they indicate the rate of postoperative complications.

Myopia or shortsightedness is a common eye disorder especially in asian countries[1,4] . Etiology of myopia includes axial length and curvature of eyeball, position and refractive index of lens[5]. myopia has become the leading cause of blindness in Asia[3]. High myopia causes irreversible loss of vision like complicated cataract, retinal detachment, vitreous haemorrhage, choroidal haemorrhage, and glaucoma (PAOG)[5].

Varies studies have tried to relate degree of myopia and central corneal thickness but results of these relations are highly unreliable. Some found no correlation between myopia and CCT and others found thinner CCT in myopic then emmetropes and rest found it as thicker CCT in myopic then emmetropes. The main aim of this study is to correlate CCT to degree of myopia and compare it with emmetropes.

II. METHODOLOGY

Patients selected for this study were examined during the year 2019 in Ophthalmology department, Saveetha Hospital, chennai. This study includes a control group of 50 emmetropics. emmetropic group consists of volunteers from students and staffs of Saveetha University. The myopic group of 50 patients were recruited from OP ward, Ophthalmology department.

Exclusion criteria includes patients with ocular disease that either cause refractive error (cataract) or alters CCT(glaucoma). Inclusion criteria includes age between 15-60 years. Informed consent was obtained from the subjects and they were clearly explained about the purpose of the study.

Details like Name, Age, Sex, visual acquity and degree of myopia were collected before CCT examination. CCT was measured usung Ultrasound pachymetry. Measured only at the centre of the cornea. Average of 3 readings were taken to reduce bias. The values are tabulated and statistically analysed.

III. DATA ANALYSIS

The distribution of CCT for emmetropes and myopic were visualized using bargraph. t-test was used to compare means between emmetropes and myopics($p<0.05$ is considered as statistically significant). MS Excel was used to compare the mean CCT of emmetropes and myopics. MS EXCEL was used to correlate CCT measurements to degree of myopia.

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IV. RESULT

A total of 50 eyes of 50 emmetropic control and 50 eyes of 50 myopic patients were selected. In emmetropic group, there were 32(34%) males and 18(36%) females. and the average age was 28.96 (range 16-58). Among patients in myopic group, there were 33(66%) males and 17(34%) females and the average age was 34.88 (range 16-59). The mean myopic spherical equivalent was -2.5D (range -0.75D to -4.25D). The distribution of the myopic spherical equivalent is shown as fig 1. Bar graph for distribution of CCT among emmetropic and myopic groups are shown as fig 2&3 respectively. In myopic, distribution appears at less CCT than for emmetropic group with mean CCT for emmetropic being 577.2 and for myopic being 558.84. Mean CCT between emmetropic and myopic group were statistically significant (p=0.0011). Myopic group had less Central Corneal Thickness than the emmetropic group. There were some correlation between CCT and degree of myopia. As degree of myopia increases, Central Corneal Thickness decreases. Mean CCT for eyes with degree of myopia more than 3.5D is 533.5micrometer and for eyes with myopic less than 1.25D is 558.33micrometer. The distribution of myopic spherical equivalent based on their Central Corneal Thickness is shown in fig 4.

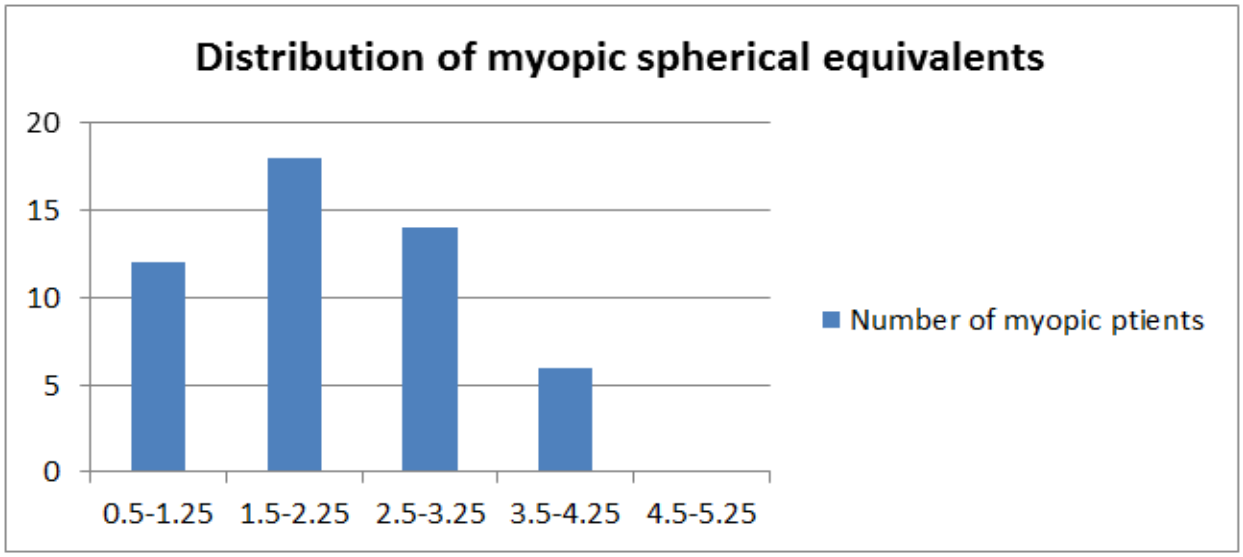

Fig 1

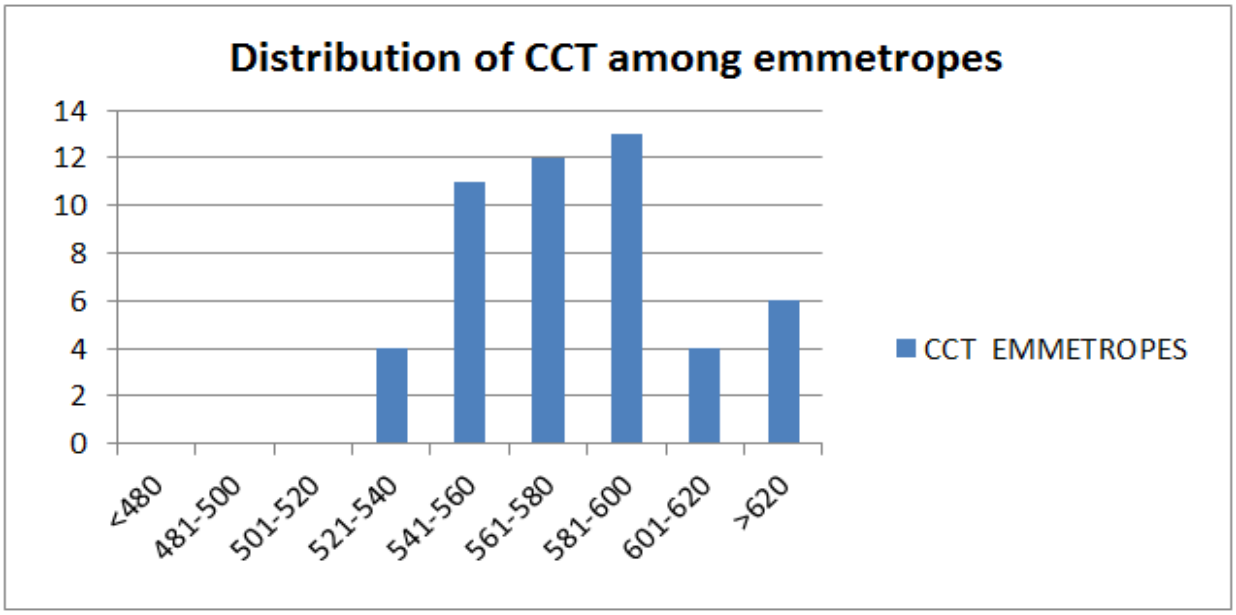

Fig 2

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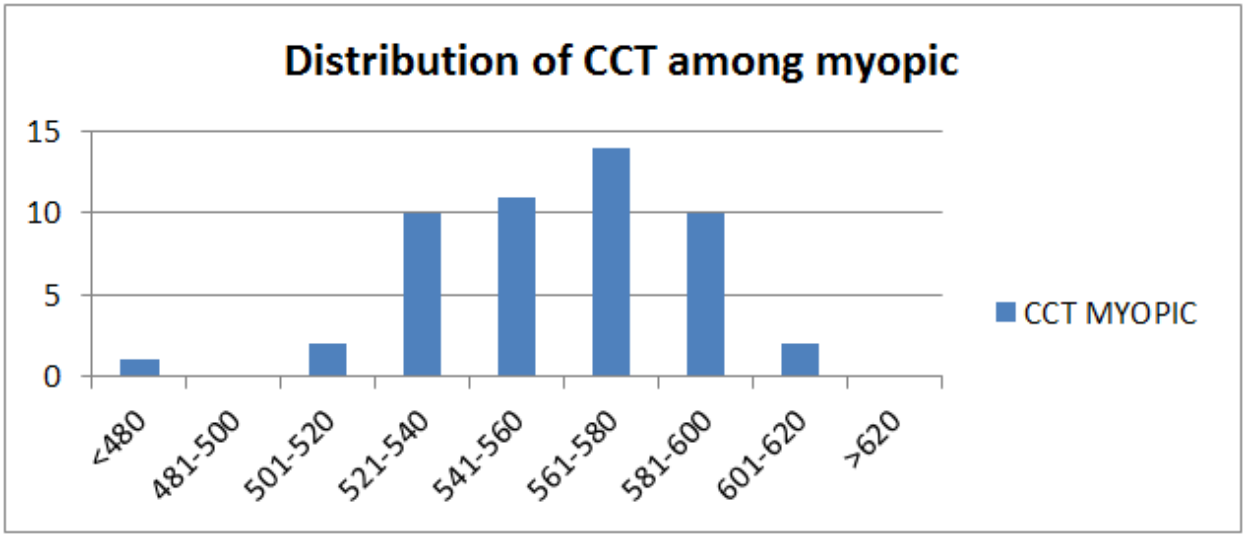

Fig 3

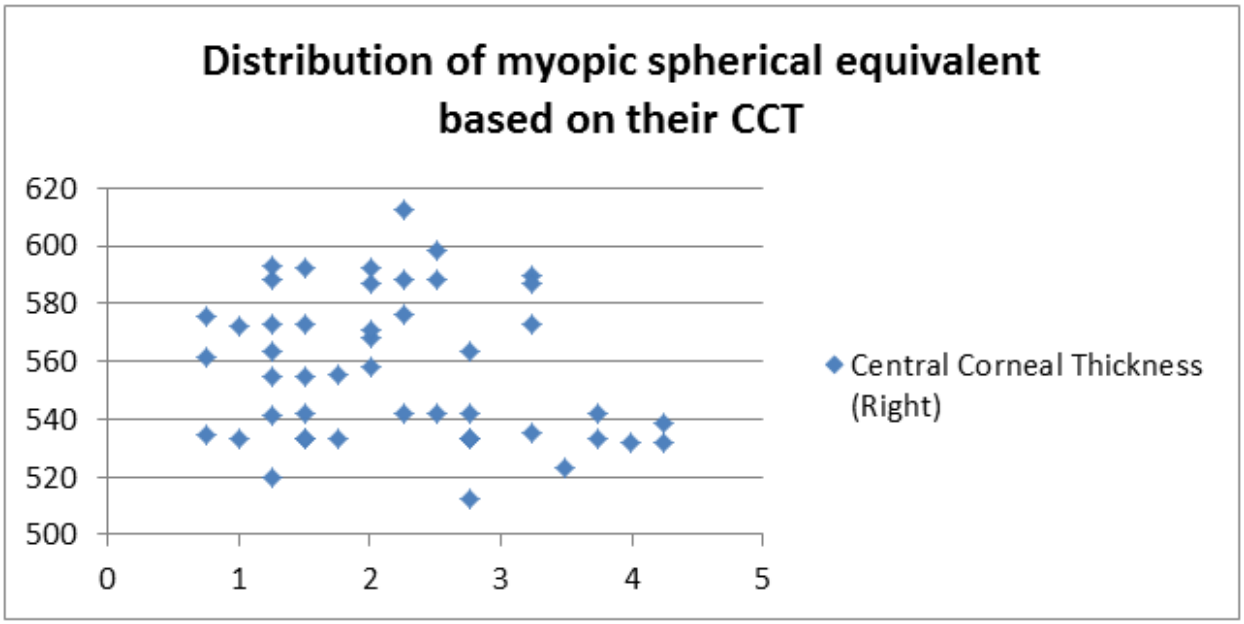

Fig 4

V. DISCUSSION

The correlation of CCT to refractive error was studied by various authors. But the result of these studies are not stable. Some found thicker CCT in myopic then emmetropes[6] and others found thinner CCT in myopic then emmetropes[4,7,8] and rest found it as no correlation between myopia and CCT[9,10]. Our study showed that as degree of myopia increases, CCT decreases and there is a statistically significant difference between the mean CCT of the emmetropic and myopic.

VI. CONCLUSION

In myopia, either axial length or eyeball curvature increases. It results in thinning of sclera. sometimes along with sclera, thinning of cornea also occurs because of absence of mitotic activity in the corneal endothelium after birth[11]. Hence the corneal endothelial cells have to get flatten to cover the enlarged surface. Our study also showed that as myopic degree increases, Central Corneal Thickness decreases.

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