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ASSESSMENT OF CENTRAL CORNEAL THICKNESS IN DIFFERENT AGE GROUPS AND GENDER ATTENDING OPHTHALMOLOGY OPD AT GMERS MEDICAL COLLEGE AND GENERAL HOSPITAL,GOTRI, VADODARA, INDIA

Ophthalmology

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ABSTRACT

Purpose: To study the mean Central corneal thickness and compare it and identify correlations between Central corneal thickness , age, and gender.

Method: The study was conducted in 250 patients aged 20 to 69 years , presented in our Ophthalmology department from april to october 2019.Pateints were taken according inclusion and exclusion criteria. Detailed history and complete ocular examination was done. CCT was measured using Pachymeter.

Result: Mean CCT for right eye was 525.8±34.6µm, left eye was 526.1±33.7µm and was 527.8±32.2µm in men and 524.4±33.2 µm in women. Mean CCT in age group 20-29 years 542.4±10.3 µm, 30–39 years535.0±6.4 µm.,40–49 years528.2±7.0µm., 50–59 years516.8 ±8.2µm., 60- 69 years 506.5±8.3µm.No statistically significant difference in CCT and gender. However, significant difference in subjects aged 20-29 years where men had higher CCT than women A statistically significant correlation was found between CCT and age.

Conclusion: No statistical significant difference between CCT and gender found except in youngest age group. Statistical significance difference between CCT and age. CCT decreases with age increases.

KEYWORDS

central corneal thickness, age, gender

INTRODUCTION:

The cornea is part of the optical system of the eye, and its condition is directly related to the quality of eyesight. Measurement of central corneal thickness (CCT) and endothelial cell parameters is important when undertaking a functional and morphologic evaluation of the cornea for diagnostic purposes or before various surgical interventions.[3]

Due to the increasing popularity of correction of refractive defects by excimer laser, CCT has come to have higher prognostic significance for determination of the success of surgery and probable post-surgical complications.[6] CCT is always measured before such procedures. Surgery in the case of a cornea that is too thin may result in a very serious postoperative complication, like corneal ectasia.[1] It has been assumed that the optimal CCT for refractive surgery is more than 500 µm; however, opinions regarding the impact of CCT in anticipating treatment of refractive defects (ie, which CCT value is too low to perform surgery safely) are not consistent and studies of patients with relatively thin CCT indicate no excess risk for postoperative complications.[8]

It should be remembered that intraocular pressure depends on corneal thickness; a thick cornea may explain a falsely elevated intraocular pressure reading and, conversely, falsely low intraocular pressure is measured in eyes with thin corneas.[5] This should be taken into consideration in order to avoid both overdiagnosis and underdiagnosis of glaucoma and ocular hypertension.[9]

Standards must be established in order to compare results obtained in different population groups. Since CCT varies in these populations, it is very important to verify the results and determine the limits of normal values.Further, corneal parameters differ according to patient age.[12] Awareness of these ethnicity-related and age-related physiologic changes enables us to assess the influence of disease and surgical procedures more accurately.

MATERIAL AND METHOD:

Study was clinical, prospective and comparative.Sample selection : All the patients coming to ophthalmology OPD according to inclusion criteria from Basicmethod of data collection was observational, by measurements or by using information from existing records and reports.Age 20 to 69 years patients attending ophthalmology OPD at GMERS Medical College And Hospital, Gotri, Vadodara during the study period fromapril to october 2019 were included in the study. Exclusion criteria for the study was corneal degeneration ,ulceration or any other corneal diseases, Anterior segment surgical procedures, Ocular conditions like glaucoma , current conjunctivitis,Systemic diseases influencing cct like diabetes mellitus,Wearing of contact lenses.

An informed consent was taken from participants. Participants were undergone proper history taking about any previous or current ocular disease, previous eye trauma or surgery, wearing of contact lenses, and comorbidity, eg, diabetes or other chronic disease that may influence CCT. Detailed ocular examination was done . Participants were seated during the examination. After that one drop of 0.5% paracain eyedrops was applied for local anesthesia. After that the probe which is conacted to the ultrasonic contact pachymeter machine was put in contact of central cornea and the machine automatically took up the 5 measurements and gave mean value of 5 readings which was noted. The same way CCT was noted in other eye. After that 0.3% ciprofloxacin eyedrops was put in each eye.

Study was conducted in total 250 patients aged from 20 to 69 years. The subjects were devided into five groups on the basis of age as follows: 20–29 years, 30–39 years, 40–49 years, 50–59 years, 60–69 years. Amongst them 97(38.8%) were male and 153 (61.2%) were female Mean CCT was calculated and the results were compared between the age groups. Correlations between CCT, age, and sex was studied.

Statistical Analysis:

Continuous variables were evaluated using the mean and standard deviation. The z test was used for the comparision. Means of more than two groups were compared using one way analysis of variance.

RESULTS:

Total 250 patients aged form 20 to 69 years were examined amongst them 97 (38.8%) were male and 153 (61.2%) were female.

Mean CCT for overall population was 525.8±34.6µm in right eye and 526.1±33.7µm in left eye. There was no statistically significnce diffrence in CCT was noted between two eyes (p>0.05) so right eye was selected for furthur evaluation. The mean CCT in right eye was 527.8±32.3 µm in male and 524.4±33.2µm. There was no statistically significant difference found between gender (p>0.05) except in age group one where males had thicker corneas than female.

Mean CCT in right eye in age group 20-29 years was542.4±10.3µm, 30–39 years was 535.0±6.4µm., 40–49 years was 528.2±7.0µm., 50–59 years was 516.8±8.2 µm., 60- 69 years was 506.5±8.3µm.The mean CCT in different age groups are shown in table 1.

Table 1: Mean CCT in age groups

Age groups	Mean of CCT in Right Eye	Mean of CCT in Left Eye
20-39	542.4 ± 10.3 µm.	541.3 ± 10.2 µm.
30-39	535.0 ± 6.4 µm.	536.2 ± 5.6 µm.
40-49	528.2 ± 7.0 µm.	526.9 ± 7.1 µm.
50-59	516.8 ± 8.2 µm.	517.9 ± 8.0 µm.
60-69	506.5 ± 8.3 µm.	508.0 ± 7.8 µm.

A statistically significant correlation was found between CCT and age.All age groups were compared and statistically significance ($p<0.05$) was found with the increase of age. The change in CCT with increase of age shown in figure 1.

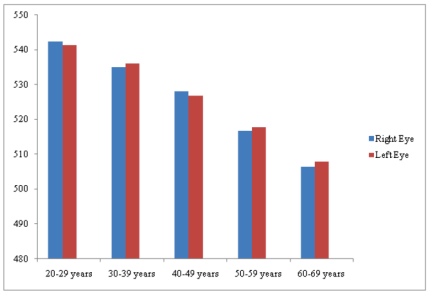

Figure 1: central corneal thickness and age

Thus we got thinner corneas with increasing age but there was no significant diffrence in CCT and gender.

DISCUSSION:

Our purpose of the study was to identify correlations between Central corneal thickness , age, and gender.Total 250 patients aged form 20 to 69 years were examined amongst them 97 (38.8%) were male and 153 (61.2%) were female.

We found no statistically significant difference found between gender ($p>0.05$) except in age group one where males had thicker corneas than female.

There is no clear answer as to why women have thinner corneas than men. It is possible that hormonal changes in women may account for this difference.[10] It has been shown established that CCT is lowest in women at the beginning of the menstrual cycle and highest at the end and during ovulation.[2]Further, Keskin et al determined that CCT was significantly decreased in postmenopausal women compared with their premenopausal counterparts.[16]

We got mean CCT for overall population was 525.8 ± µm in right eye and 526.1 ± µm in left eye. There was no statistically significant difference between two eyes.

There was statistically significant difference between the age and CCT ($p<0.05$). We found that CCT decreases with the age.

Some authors did not define any dependence between cct and age; others, however, refer to a decrease in CCT with age. Kamiya et al reported that biomechanical data for the cornea change during the course of the lifetime, but could not identify significant changes in age-related CCT or intraocular pressure.[15] Merciecan et al reported that the cornea becomes thinner with age and mean CCT is lower in women than in men.[4] Prasad et al reached the same conclusion after measuring corneal parameters in their study.[14]

The impact of age on corneal thickness can be explained in different ways. Some histologic studies explains, the corneas of older people are thinner because of a reduction in keratocyte density and possible destruction of collagen fibers, and senior individuals are exposed to environmental factors for a longer period of time, which might influence corneal structure.[7] Hashemian et al demonstrated that corneal endothelial cell density decreases in persons until 60 years of age; however, the volume of these cells increases.[13] yet there is no consensus among scientists as to whether the corneal endothelium and CCT are interdependent.

CONCLUSION:

In our study we observed the difference in CCT between the gender only in the youngest age group, indicating that young men have a higher CCT than women.

We observed the difference between the CCT and age . On the basis of our study we can conclude that CCT decreases with the age.

REFERENCES:

1. Caster AI, Friess DW, Potvin RJ. Absence of keratectasia after LASIK in eyes with preoperative central corneal thickness of 450 to 500 microns. J Refract Surg. 2007;23(8):782–788.
2. Galgauskas S, Ringailaite E, Juodkaite G. [Central corneal thickness and its relationship to gender, intraocular pressure and corneal curvature]. Medicinos Teorija ir Praktika. 2009;15(1):19–23. Lithuanian.
3. Leskul M, Aimpun P, Nawanopparatskul B, et al. The correlations between central corneal thickness and age, gender, intraocular pressure and refractive error of aged 12–60. J Med Assoc Thai. 2005;88 Suppl 3:S175–S179.
4. Mercieca K, Odogu V, Fiebai B, Arowolo O, Chukwuka F. Comparing central corneal thickness in a sub-Saharan cohort to African Americans and Afro-Caribbeans. Cornea. 2007;26(5):557–560.
5. Hahn S, Azen S, Ying-Lai M, Varma R; Los Angeles Latino Eye Study Group. Central corneal thickness in Latinos. Invest Ophthalmol Vis Sci. 2003;44(4):1508–1512
6. Narayanaswamy A, Chung RS, Wu RY, et al. Determinations of corneal biomechanical properties in an adult Chinese population. Ophthalmology. 2011;118(7):1253–1259.
7. Torres RJ, Jones E, Edmunds B, Becker T, Cioffi GA, Mansberger SL. Central corneal thickness in North western American Indians/Alaskan Natives and comparison with white and African-American persons. Am J Ophthalmol. 2008;146(5):747–751.
8. Suzuki S, Suzuki Y, Iwase A, Araie M. Corneal thickness in an ophthalmologically normal Japanese population. Ophthalmology. 2005;112(8): 1327–1336.
9. Patel HY, Patel DV, McGhee CN. Identifying relationships between tomography-derived corneal thickness, curvature, and diameter and in vivo confocal microscopic assessment of the endothelium in healthy corneas of young adults. Eye. 2009;23(2):270–278.
10. P.R. Healey; P. Mitchell; E. Rochtchina; A.J. Lee; E.–M. Chia; J.J. WangCentral Corneal Thickness in an Older Population: The Blue Mountains Eye Study. IOVS an ARVO journals .2005;43(13):352
11. Xiao-Yang Luo, MD, PhD1,2; Wei Dai, MD, MPH2; Miao-Li Chee, BSc2; et al Association of Diabetes With Central Corneal Thickness Among a Multiethnic Asian Population JAMA Netw Open. 2019;2(1):e186647. doi:10.1001
12. Vivek Oommen Varghese, Latha N Vadakkemadam, Shamin Jacob, KK Praveena, Ratheesh Raj, Jipina KizhakkepattDepartment of Ophthalmology, Academy of Medical Sciences, Pariyaram, Kannur, Kerala, IndiaStudy of factors influencing central corneal thickness among patients attending ophthalmology outpatient department at a tertiary care center in North Kerala .kerala journal of ophthalmology. 2016:28(3):193-198
13. Hashemian MN, Moghimi S, Fard MA, Fallah MR, Mansouri MR. Corneal endothelial cell density and morphology in normal Iranian eyes. BMC Ophthalmol. 2006;6:9–10.
14. Prasad A, Fry K, Hersh PS. Relationship of age and refraction to central corneal thickness.Cornea. 2011;30(5):553–555.
15. Kamiya K, Shimizu K Ohmoto F. Effect of aging on corneal biomechanical parameters using the ocular response analyzer. J Refract Surg. 2009;25(10):888–893.
16. Keskin N, Canturk S, Aydin S, Saygili H, Ozgün C. An objective method to determine corneal changes during menopause.Clin Exp Obstet Gynecol. 2009;36(3):176–178.