Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/13518
DOI URL: http://dx.doi.org/10.21474/IJAR01/13518

RESEARCH ARTICLE

CHANGES IN CENTRAL CORNEAL THICKNESS IN HEALTHY PREGNANT WOMEN-A CLINICAL STUDY

Dr. Manga Venkat Chelluboyina[1] and Dr. Ramakrishna Chatti[2]

1. Assistant Professor, Department of Ophthalmology, Andhra Medical College, Visakhapatnam
2. Civil Assistant Surgeon Specialist-Ophthalmology, Area Hospital, Seethampeta, Srikakulam District.

Manuscript Info

Manuscript History
Received: 05 August 2021
Final Accepted: 09 September 2021
Published: October 2021

Key words:-
Central Corneal Thickness, Pregnancy, Pachymetry

Abstract

Aim of the Study: To determine the changes in central corneal thickness during pregnancy in healthy pregnant women.

Methods: 50 pregnant women aged between 25 years to 35 years, not suffering from refractive errors and with no prior history of Kerato-refractive procedures and not suffering from any medical or surgical complications of pregnancy, attending to the OPD of OBG Department of King George Hospital-Andhra Medical College, Visakhapatnam were included in our study. Central Corneal Thickness (CCT) was measured in all these 50 pregnant women with a hand held portable automated corneal Pachymeter. CCT measurements were made in the first, second, third trimesters and also after a period of 3 months from date of delivery.

Results: The mean CCT was found to be significantly higher in the second and third trimesters, compared with the first trimester and at a period of 3 months postpartum ($p < 0.001$).

Conclusion: The CCT value was significantly higher in the second and third trimesters of pregnancy.CCT is an important factor to be considered while measuring Intra Ocular Pressure (IOP). The IOP measurements in pregnant women should always be corrected for CCT thereby preventing false high or low recordings of IOP.The target IOP should be carefully decided after taking into consideration the changes in CCT values in pregnant women with glaucoma.The changes in CCT during pregnancy should be kept in mind while performing any refraction or corneal topography studies during pregnancy.

Introduction:-

Pregnancy is a process that brings about physiological changes in almost all the organs of the body due to changes in the metabolic, immunologic, vascular and hormonal systems. The eye is one of the most important organs affected by these changes.[1] The hormonal changes in pregnancy may lead to an increase in fluid volume in various tissues of the body. The ocular adnexa along with the anterior and posterior segments of the eye, undergo various changes during pregnancy.[2]

Aim of the Study

To determine the changes in central corneal thickness during pregnancy in healthy pregnant women.

Corresponding Author:- Dr. Manga Venkat Chelluboyina
Address:- Assistant Professor, Department of Ophthalmology, Andhra Medical College.

Methodology:-

Study Design: Observational study
Study Setup: Department of Obstetrics and Gynecology, King George Hospital, Visakhapatnam
Study Period: February 2018 to February 2019
Sample Size: 50 healthy pregnant women

Inclusion Criteria

50 Pregnant women aged 25 years to 35 years, attending for routine Antenatal Screening at Department of Obstetrics and Gynecology of King George Hospital-Andhra Medical College, Visakhapatnam

Exclusion Criteria

Pregnant women with Refractive Errors and History of Prior Kerato-refractive procedures
Pregnant women with medical or surgical diseases complicating pregnancy

Methods:-

Informed Consent was obtained from all the participants included in the study. The participants included in the study were subjected to complete ocular examination including recording of best-corrected visual acuity by Snellen's Chart, anterior segment examination with a hand held slit lamp and fundus examination with portable indirect ophthalmoscope. Measurement of Central Corneal Thickness was done with a handheld portable automated corneal pachymeter. The CCT was measured at first trimester, second trimester, third trimester and after three months from the date of delivery.

Analysis

The collected data was entered into a master sheet. ANOVA test was applied to test for statistical significance of the values of the Central Corneal Thickness obtained in different periods of time in the same patient, I.e., first, second, third trimesters and 3 months after date of delivery. P value of less than 0.05 in the ANOVA test was considered to be statistically significant. The data was expressed in mean along with standard deviation.

Results:-

The mean Central Corneal Thickness (CCT) value was found to be significantly higher in the second and third trimesters when compared with the first trimester and at 3 months postpartum ($p < 0.001$). The highest recording of the mean CCT was observed in the third trimester of the pregnancy. The CCT values returned to their first-trimester levels at 3 months postpartum period. (Table-1)

Table 1:- Mean CCT in various Trimesters and Postpartum Period.

Time Period	1st Trimester	2nd Trimester	3rd Trimester	3 Months Post Partum
Mean CCT	561.41+/-22.17	566.64+/-21.99	573.68+/-24.03	562+/-23.40

Discussion:-

Physiological changes in corneal thickness can occur during pregnancy.[3] It has been reported that, the Central corneal thickness (CCT) increases during pregnancy. The reason for the increase in corneal thickness in pregnant women could be the corneal oedema resulting from increased retention of water by the tissues.[4] Measurement of IOP is affected by CCT and this may lead to errors in the assessment of the true IOP. CCT is usually taken into consideration while diagnosing glaucoma and also while setting target pressures. IOP has been shown to be a major predictor and also a modifiable risk factor for glaucoma diagnosis and progression. Most of the anti glaucoma medications belong to group C of the FDA classification, hence the treatment of glaucoma diagnosed during pregnancy or prior to conception is of importance for both the mother and the foetus. Therefore, accurate measurement of the IOP and thereby setting a target pressure is of prime importance for calculation and adjustment of the dosages of the anti glaucoma medication.[5]

In a study conducted by Atlas M, Duru N et al, they found that there was an increase in various anterior chamber parameters like corneal volume, corneal thickness, and corneal curvature in the third trimester. The observations of our study were similar to this study regarding central corneal thickness which was more in the third trimester. As per

a study condcuted by D. Pizzarello Louis et al, significant change in the central corneal thickness and intraocular pressure were noted in pregnant women during their 2nd and 3rd trimesters which was also similar to our study.[6]

Conclusion:-

There was a statistically significant increase in the central corneal thickness in the third trimester of pregnancy. The CCT values returned to their normal first trimester values by 3 months post partum period. Physiological changes occurring in CCT during pregnancy should be taken into consideration while recording IOP during treatment and follow-up of glaucoma diagnosed during pregnancy or prior to conception. The changes in Central Corneal Thickness may have an impact on the refractive error the pregnant woman is having and hence it is better to avoid changing spectacles during pregnancy and better to postpone refraction in pregnant women till three months post partum period unless it is unavoidable.

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