

Impact of Oral Contraceptive Pills on Intraocular Pressure and Central Corneal Thickness in Young Women

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ABSTRACT

Objective: To detect the impact of Oral Contraceptive Pills on Intraocular pressure and Central Corneal Thickness in young women.

Methodology: A cross sectional, multi centered study was conducted on 40 young women who used oral contraceptive pills, to see the impact of familia on central corneal thickness (CCT) and intraocular pressure (IOP) in young reproductive ladies, who had the history of this drug from last 1, 3 and 6 months.

Results: 40 reproductive young women participated in this study. CCT was divided into three categories 530-565µm, less than 530µm and more than 565µm. Out of these 40 women, 5 women had corneal thickness in the range of 530-565µm, 9 women had central corneal thickness less than 530µm and 23 women had central corneal thickness more than 565µm respectively. Like central corneal thickness, intraocular pressure was also divided into three categories 10-20mmHg, less than 10mmHg and more than 20mmHg. 5 women had intraocular pressure was in the range 10-20mmHg, 12 women had intraocular pressure was less than 10mmHg and 23 women have intraocular pressure was more than 20mmHg.

Conclusion: Intraocular pressure and central corneal thickness was raised in ladies who had longer history of oral contraceptive pills from last 6 months.

Keywords: Oral contraceptive pills, Central Corneal Thickness, Intraocular Pressure.

INTRODUCTION

Contraceptive pills are the pills that are used to prevent pregnancy. These pills are also called Birth control pills or Just pills. They are taken orally.¹ Some oral contraceptive pills have estrogen and progestin hormones. The mucus at the womb's neck becomes thicker and more resistant to dilution when a woman takes contraceptive tablets, making it more challenging for sperm to reach an egg inside.² The uterine lining is reduced in size as a side effect of these contraceptive pills, making it more difficult for a fertilised egg to implant and develop within.³

If you have been using oral contraception drugs for a long time period, it could be enough to warrant a glaucoma screening. The relation between female sex hormones and variations in intraocular pressure (IOP) has long been established.⁴ Taking this medication raises the chance of blood clots, stroke, heart attack, and breast, uterine, or ovarian cancer. However, there is an increased risk of open-angle glaucoma in women who had used oral contraceptives for long period of time.⁵ Measurement of intraocular pressure, diagnosing and treating eye illnesses, such as glaucoma and other refractive problems, requires knowledge of the cornea's central thickness.⁶ Pakistan has a high total fertility rate of 3.8, as well as a low modern contraceptive prevalence rate of 26 percent as well as a high unmet need of roughly 20%. The majority of contraceptive usage globally is due to modern contraceptive techniques.⁷ In 2019, 44% of ladies of reproductive age used a contemporary form of contraceptive pills globally. This accounts for 91% of all contraceptive users, with the remaining 9% utilizing conventional techniques.

The eye's internal fluid pressure is known as intraocular pressure (IOP). The aqueous humour exerts a pressure, measured in units of force per unit area, on the corneal surface of the anterior eye. Estimated intraocular value is 15.5 to 20 mmHg. A tonometer is a device that measures the pressure within the eye.⁸

An average corneal thickness (CCT) is 540 micrometer to 560 micrometer. A thick cornea is 565 micrometer or greater. A very thick cornea being greater than 600 micrometer.⁹ The accuracy of intraocular pressure (IOP) measurements using applanation tonometry is known to be influenced by central corneal thickness (CCT).¹⁰ Patients with a thicker central corneal thickness (CCT) may have a greater intraocular pressure (IOP) measurement than is really present.¹¹ Oral contraceptive pills

usage has been linked to serious ocular illnesses and many other refractive errors but there have also been studies that suggest that oral contraceptive pills (OCP) use affects central corneal thickness and intraocular pressure. Oral contraceptive pills have an effect on central corneal thickness and intraocular pressure, making these ladies glaucoma suspected.¹²

METHODOLOGY

A cross sectional, multi-centered study was conducted. 40 reproductive women were taken in this study. This study was accomplished from November 2021 to May 2022. After taking informed consent from all participants. Women with other ocular disorders such as keratitis, uveitis and with other high refractive errors were excluded from this study. Their intraocular pressure was measured by applanation tonometer (Reichert 7 CR) and central corneal thickness was measured by pachymeter (Nidek US-400). Purposive sampling technique was used to collect the data. After the collection and analysis of data by using self-made proforma, variation in intraocular pressure (IOP), central corneal thickness (CCT) and somehow on visual acuity in young ladies due to the usage of oral contraceptive pills (OCP) was seen. Results were compared from subjects who used the contraceptive pills for 1, 3 and 6 months. Chi square test was used to check the association between Oral Contraceptive Pills, IOP and CCT.

Statistical analysis: The statistical analysis was performed by using SPSS 22.

RESULTS

In this study 40 reproductive women were participated with age ranging from 22 to 35 years. Intraocular pressure and central corneal thickness was estimated by applying questionnaire from all 40 participants. Out of 40 women, 5 women have corneal thickness was in the range of 530-565µm, 9 women have corneal thickness was less than 530µm and 23 women have corneal thickness was more than 565µm. 5 women have intraocular pressure was in the range of 10-20mmHg, 12 women have intraocular pressure was less than 10mmHg and 23 women have intraocular pressure was more than 20mmHg during the duration of 1, 3 and 6 months respectively while using the OCP. It means that the intraocular pressure and central corneal thickness was

high in those ladies who use oral contraception pills for long duration. Results were highly significant. And probability value was less than 0.05 ($p < 0.05$). Significant value for chi square test for CCT was $p=0.058, 0.041, 0.020$ at the level of 5% of confidence interval. While significant value for IOP was $p=0.057, 0.036, 0.022$. So there is strong relationship between OCP on IOP and CCT. This study reveals that more the usage of OCP more raise in IOP and CCT.

Table 1: Association of DOCP with CCT and IOP (1 month)

Range of CCT and IOP				Chi square	P values
Duration of OCP	Less than 530µm	530-565µm	More than 565µm	2.5258	0.058
1 month (CCT)	2	1	2	2.552	0.057
IOP range	Less than 10mmHg	10-20mmHg	More than 20mmHg		
1 month (IOP)	2	1	2		

Chi square = 2.5258, df = 3, p value = 0.058, Chi square = 2.552, df = 3, p value = 0.057

Figure 2: Association of DOCP with CCT and IOP (3 months)

Range of CCT and IOP				Chi square	P values
Duration of OCP	Less than 530µm	530-565µm	More than 565µm	3.068	0.041
3 months (CCT)	2	3	4	3.099	0.036
IOP range	Less than 10mmHg	10-20mmHg	More than 20mmHg		
3 months (IOP)	3	3	6		

Chi square = 3.068, df = 4, p value = 0.041, Chi square = 3.099, df = 4, p value = 0.036

Figure 3: Association of DOCP with CCT and IOP (6 months)

Range of CCT and IOP				Chi square	P values
Duration of OCP	Less than 530µm	530-565µm	More than 565µm	3.011	0.020
6 months (CCT)	6	5	15	4.006	0.022
IOP range	Less than 10mmHg	10-20mmHg	More than 20mmHg		
6 months (IOP)	6	3	14		

Chi square = 3.011, df = 4, p value = 0.020, Chi square = 4.006, df = 4, p value = 0.022

DISCUSSION

The results of this investigation demonstrated that central corneal thickness (CCT) values were considerably greater in women who used oral contraceptive pills (OCP).¹³ A growing number of women of childbearing age are turning to OCP as a method of birth control. In addition, it can help people control their menstrual periods.¹⁴ Retinal vascular lesions are just one of several eye problems that have been linked to OCP use in young women.¹⁵ The anatomical and functional characteristics of the anterior and posterior portions of the eye appear to be influenced by sex hormones.¹⁶

The influence of OCP usage on these parameters was the focus of this research. CCT has a significant impact on accurate intraocular pressure (IOP) measurement, which is the most critical parameter in glaucoma diagnosis and therapy.¹⁷ The CCT measurement assists the ophthalmologist in obtaining a proper diagnosis for improved glaucoma and glaucoma suspicions care.¹⁸ Thin CCT and high IOP have been considered as predictors of glaucoma development and progression.¹⁹ This study will help the early diagnosis and treatment in variation intraocular pressure (IOP) and central corneal thickness (CCT) in women who use oral contraceptive pills (OCP).

Women should not use oral contraceptive pills for longer duration. If they experience any problem in their visual acuity or any eye related issue they should consult their ophthalmologist or optometrist for regular checkup because oral contraceptive pills raise the intraocular pressure and central corneal thickness because of glaucoma risk.

CONCLUSION

Our findings revealed that CCT values were significantly higher in patients who used oral contraception pills for longer durations. The ophthalmologist treating these individuals needs to be aware of the possibility of increased CCT levels. Oral contraceptive pills have an effect on central corneal thickness and intraocular pressure, make them suspected for glaucoma in early age.

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