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ASSOCIATION OF CATARACT, CORNEAL THICKNESS AND INTRAOCULAR PRESSURE WITH DIFFERENT CONTRACEPTIVE METHODS IN FEMALES

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ABSTRACT:

Background: Cataract, elevated intraocular pressure (IOP), and corneal thickness are important parameters in assessing ocular health. The association between contraceptive methods and the incidence of these ocular conditions among females has been a subject of interest. Previous research has suggested a potential relationship between long-term contraceptive use and certain ocular effects. This study aims to further investigate this association and provide insights into the ocular health of females using different contraceptive methods. By exploring these ocular parameters in relation to different contraceptive methods, this study aims to contribute to the existing body of knowledge on the ocular effects of contraceptive therapy in females.

Purpose: To diagnose cataract, raise in intraocular pressure, and corneal thickness in female patient using different contraceptive methods.

Objective: To determine whether the association contraceptive methods and the incidence of cataract, raised IOP and corneal thickness among females.

Participants: A sample size of 178 females aged between 25 to 50 years has been observed.

Study Design: descriptive observational study.

Place and Duration of Study: Sight Centre Bahawalpur from April to June 2023.

Methodology: One seventy-eight females who used different contraceptive methods with in last two years and aged between 25-50 were included in this study after approval from the ethical review board. Females with any systemic disease, pregnancy and lactating mothers were excluded from the study. Females with ocular diseases, like trachoma, cataract, keratitis, uveitis, corneal dystrophies, Keratoglobus, Keratoconus, ocular trauma, and high refractive errors were also excluded. Each subject underwent full ocular examination including best-corrected visual acuity using Snellen acuity chart and Bio-microscopic examination of anterior segment and the fundus. Central corneal thickness (CCT) was measured with ultrasonic pachymeter and the intraocular pressure was measured with noncontact tonometer at the time of examination. The data was collected by self-designed proforma and analyzed by using SPSS version 20.

Results: In this study, 178 women between the ages of 25 and 50 who had been using contraception for more than two years were divided into three groups based on the method of birth control they used: oral contraceptives (n = 75), injectable contraceptives (n = 43), and contraceptive implants (n = 60). 32% of the subjects had cataract development in their eyes. The prevalence of cataracts did not differ statistically significantly between the contraceptive groups, though. Women who used oral contraceptive pills had a considerably higher mean intraocular pressure (IOP) than those who used injectable contraceptives and contraceptive implants, with a mean IOP of 15.2 mmHg. Additionally, compared to women who used oral contraceptive pills and injectable contraceptives, those who used contraceptive implants had a considerably larger mean central corneal thickness (CCT). These studies also show possible connections between contraceptive techniques and increased IOP**.**
Conclusions: This study sheds light on possible relationships between various forms of birth control and ocular characteristics. Contraceptive implants and oral contraceptive tablets were linked to higher central corneal thickness and intraocular pressure, respectively, whereas there was no discernible difference in cataract formation. Further research into the underlying processes and long-term effects of these correlations is warranted in light of these findings. When assisting women in choosing a method of contraception, healthcare professionals should consider these potential ocular effects; further investigation is required to improve our knowledge in this area.

Keywords: Intra Ocular Pressure (IOP), Oral Contraceptive Pills (OCPS), Hormone Replacement Therapy (HRT), Combined Oral Contraceptives (COCS), Oral Contraceptive (OCs), Combined Injectable Contraceptive (CICs).

INTRODUCTION:

Lens and Cataract:

The lens is a curved structure in the eye that that bends light and focuses it for the retina to help you see images clearly. The crystalline lens, a clear disk behind the iris, is flexible and changes shape to help you see objects at varying distances. [1]

The lens of the eye is a biconvex, relatively acellular, optically transparent intraocular structure that with the cornea serves to transmit light to the retina with minimal light scattering. Early anatomists viewed the lens as the location of meaningful visualization. We now know that this is the function of the retina, with the lens serving as a conduit of light transmission and focus to the retina. The lens can change shape with the aid of the ciliary muscles, thereby changing the focal distance to the retina and bringing the image into sharp focus on the retina. This adjustment of the lens is known as accommodation (similar to the focusing of a photographic camera via movement of its lenses). The lens is flatter on its anterior side than on its posterior side. [2]

A cataract is a cloudy area in the lens of your eye (the clear part of the eye that helps to focus light). Cataracts are very common as you get older. In fact, more than half of all Americans age 80 or older either have cataracts or have had surgery to get rid of cataracts. [3] A cataract is when your eye's natural lens become cloudy. Proteins in your lens break down and cause things to look blurry, hazy or less colorful. [4]

A cataract is a dense, cloudy area that forms in the lens of the eye. A cataract begins when proteins in the eye form clumps that prevent the lens from sending clear images to the retina. The retina works by converting the light that comes through the lens into signals. It sends the signals to the optic nerve, which carries them to the brain. It develops slowly and eventually interferes with your vision. You might end up with cataracts in both eyes, but they usually don't form at the same time. Cataracts are common in older people. Over half of people in the United States have cataracts or have undergone cataract surgery by the time they're 80 years old, according to the National Eye Institute Trusted Source. [5]

Cataract Is the leading cause of visual impairment in older adults in the world. Improvements in living conditions, public health, and medicine have resulted in a dramatic increase in the number of people living past the age of 65 years, so cataract will continue to be a public health issue in the future. By 2020, an estimated 52 million Americans will be older than 65 years. In the United States

at present, more than 1 million cataract operations are performed annually at a cost of $3.4 billion, consuming 12% of the Medicare budget, and a steady increase is projected. Despite effective surgical treatment for the disease, cataracts place a large burden on the older population and the health care system. The identification of a factor to slow the progression of lens opacification would translate into a significant reduction in cataract surgeries and greatly improve the quality of life for older adults. After the age of menopause, it has been consistently noted that women begin to have higher rates of cataract than men. Two large cross-sectional studies, the Beaver Dam Eye Study and the Blue Mountains Eye Study, have found protective associations between current hormone use and lens opacity. However, the Beaver Dam Eye Study found the association to be with nuclear opacity, whereas the Blue Mountains Eye Study found an association with cortical opacity and none with nuclear opacity. In both populations, women were included who had not reached menopause and whose endogenous estrogen exposure was not yet diminished. Recently, the Beaver Dam Eye Study published a report showing no association between use of hormone replacement therapy (HRT) and incident opacities for 5 years. However, it is unclear whether the study looked at current HRT use or duration of HRT use, and this study may not have had the power to detect an association. [6]

Intraocular Pressure (IOP):

Intraocular pressure (IOP) is the fluid pressure of the eye. As pressure is a measure of force per area, IOP is a measurement involving the magnitude of the force exerted by the aqueous humor on the internal surface area of the anterior eye. The IOP can be theoretically determined by the Goldman equation, which is IOP = (F/C) + P, where F represents aqueous flow rate, C represents aqueous outflow, and P is the episcleral venous pressure. A change or fluctuation in any of these variables will inevitably alter the IOP. [7]

Ocular hypertension is when the pressure inside the eye is higher than normal. Eye pressure is measured in millimeters of mercury (mmHg). Normal eye pressure ranges from 10 to 21 mmHg. Ocular hypertension is an eye pressure of greater than 21 mmHg. [8] Eye pressure—also called intraocular pressure or IOP—is a measurement of the fluid pressure inside the eye. Measuring it is like measuring blood pressure. [9]

Normal IOP of 10-21mmHg is important in maintaining eye shape and perfusion of the cornea and lens (avascular structures which rely on aqueous humor for nutrients, oxygen and clearance of their metabolic waste). Low IOP can cause vision impairment but almost exclusively occurs in post-surgical eyes. Elevated IOP is important to identify as it is the only modifiable risk factor for glaucoma. “Normal” IOP is a term that has fallen out of favor due to the fact that glaucoma can occur at almost any IOP—reaffirming the recommendation that all patients 40 and over have a thorough, dilated eye exam. [10]

Eye pressure, also called intraocular pressure (IOP) refers to the fluid pressure inside the eye. Maintaining a healthy IOP will help to preserve your vision and prevent vision loss from eye conditions such as glaucoma, a sight-threatening ocular disease. [11]

Glaucoma is a disease that damages your eye’s optic nerve. It usually happens when fluid buildup in the front part of your eye. That extra fluid increases the pressure in your eye, damaging the optic nerve. [12]

Glaucoma is a common eye condition where optic nerve, which connects the eye to the brain, becomes damage. Glaucoma is a condition that damages your eye's optic nerve, and it gets worse over time. It's often linked to a buildup of pressure inside your eye. Glaucoma tends to run in families. You usually don’t get it until later in life. The increased pressure in your eye, called intraocular pressure, can damage your optic nerve that sends images to your brain. If the damage worsens, glaucoma can cause permanent vision loss or even total blindness within a few years. [13]

Corneal Thickness:

Cornea and sclera constitute the outer covering or coat of the eyeball. The main purpose of this coat is to protect structures inside the eye. The cornea is a transparent avascular tissue that acts as a

structural barrier and protects the eye against infections. Along with the tear film, it provides proper anterior refractive surface for the eye. Cornea contributes to two-third of the refractive power of the eye. [14]

The cornea is the clear front surface of the eye. It lies directly in front of the iris and pupil, and it allows light to enter the eye. Viewed from the front of the eye, the cornea appears slightly wider than it is tall. This is because the sclera (the "white" of the eye) slightly overlaps the top and bottom of the anterior cornea. [15]

An average cornea is between 540 µm and 560 µm. A thick cornea is 565 µm or more, with a very thick cornea being greater than 600 µm. Corneal thickness is important because it can mask an accurate reading of eye pressure, causing doctors to treat you for a condition that may not really exist or to treat you unnecessarily when are normal. Actual IOP may be underestimated in patients with thinner CCT, and overestimated in patients with thicker CCT.

A Thin Cornea – The Danger of Misreading Eye Pressure

Many times, patients with thin corneas (less than 555 µm) show artificially low IOP readings. This is dangerous because if your actual IOP is higher than your reading shows, you may be at risk for developing glaucoma and your doctor may not know it. Left untreated, high IOP can lead to glaucoma and vision loss. It is important that your doctor have an accurate IOP reading to diagnose your risk and decide upon a treatment plan.

A Thicker Cornea – May Mean Less Reason to Worry About Glaucoma

Those patients with thicker CCT may show a higher reading of IOP than actually exists. This means their eye pressure is lower than thought, a lower IOP means that risk for developing glaucoma is lowered. However, it is still important to have regular eye exams to monitor eye pressure and stay aware of changes.

Pachymetry – A Simple Test to Determine Corneal Thickness

A pachymetry test is a simple, quick, painless test to measure the thickness of your cornea. With this measurement, your doctor can better understand your IOP reading, and develop a treatment plan that is right for your condition. The procedure takes only about a minute to measure both eyes.

Corneal pachymetry is the process of measuring the thickness of the cornea. A pachymeter is a medical device used to measure the thickness of the eye's cornea. [16]

Oral Contraceptive Pills (OCPS):

Currently, there are three types of oral contraceptive pills: combined estrogen-progesterone, progesterone-only, and continuous or extended use pill. The birth control pill is the most commonly prescribed form of contraception in the US. Approximately 25% of women aged 15 to 44 who currently use contraception reported using the pill as their method of choice. The most commonly prescribed pill is the combined hormonal pill with estrogen and progesterone. Progesterone is the hormone that prevents pregnancy, and the estrogen component controls menstrual bleeding. Birth control pills are primarily used to prevent pregnancy. [17]

Most oral contraceptives contain a combination of 2 types of hormones: an estrogen and a progestin. Both of these hormones are naturally found in women's bodies. There are many different types of estrogens and progestins, and different types of pills contain different combinations, but they all work similarly. Some pills contain only progestin, sometimes called the "mini-pill. [18]

Birth control is a way to prevent pregnancy. There are many different methods of birth control, including hormonal contraception such as "the pill." Oral contraceptive pills consist of the hormone's progestin and estrogen, or only progestin, and must be taken orally once per day in order to prevent pregnancy. Currently, there are three types on the market: the combination pill, the progestin-only pill, and the extended/continuous use pill. [19]

Oral contraceptives (OCs) mimic ovarian hormones. Once ingested, they inhibit the release of gonadotropin-releasing hormone (GnRH) by the hypothalamus, thus inhibiting the release of the

pituitary hormones that stimulate ovulation. OCs also affect the lining of the uterus and cause the cervical mucus to thicken, making it impervious to sperm. If used consistently and correctly, OCs are an effective form of contraception. OCs may be started at any time in a woman's life up until menopause. OCs may be a combination of the hormone estrogen and a progestin or a progestin alone. [20]

Injectable Contraceptive Method:

Combined Injectable Method:

Birth control methods that can be injected may contain two hormones, a progestin and an estrogen. These combined injectable contraceptives (CICs) are effective in preventing pregnancy and can be stopped when a woman wants to get pregnant. [21]

A combined contraceptive injection is a monthly birth control shot that contains the combination of estrogen and progestin. Like Depo-Provera and the Noristerat shot, combined contraception injections are a type of hormonal birth control. Some of these injections include Cyclofem, Lunelle, and Mesigyna.[22]

Progesterone Only Injection

Progestogen-only injectable contraceptive is a long-acting contraceptive given intramuscularly to give protection against unwanted pregnancy for a period of 2 or 3 months, depending on the type. Alterations in menstrual pattern are a well-known side effect of this effective contraceptive method.[23]

Progestin-only contraceptive injectables and implants are highly effective, longer-acting contraceptive methods that can be used by most women in most circumstances. Globally, 6% of women using modern contraception use injectables and 1% use implants. Injectables are the predominant contraceptive method used in sub-Saharan Africa, and account for 43% of modern contraceptive methods used. A lower-dose, subcutaneous formulation of the most widely used injectable, depot-medroxyprogesterone acetate, has been developed. Implants have the highest effectiveness of any contraceptive method.[24]

Implant Contraceptive Method:

Contraceptive implants are a long-term birth control method. They're also called long-acting reversible contraception, or LARC. A contraceptive implant is a flexible plastic rod about the size of a matchstick that is placed under the skin of the upper arm. The implant releases a low, steady dose of the hormone progestin. Birth control implants are devices that go under a woman's skin. They release a hormone that prevents pregnancy. The implant available in the U.S. is Nexplanon. It's a newer version of the implant Implanon. You might hear people call them arm bars. The implant is a plastic rod about the size of a matchstick. It contains a form of the hormone progesterone called etonogestrel. [25]

The contraceptive implant is over 99% effective. Only around 1 in 3,000 sexually active women using the implant will become pregnant each year, often because they were actually pregnant at the time of insertion. This is the lowest contraceptive failure rate of any method, including sterilization **(**male or female). In fact, in most studies of the implant, no women became pregnant at all. [26]

Contraceptive implants consist of nonbiodegradable, flexible rods that are inserted sub dermally into the upper arm. The active hormone is contained within the core of each rod and is released by steady diffusion into the circulation. Insertion and removal have to be undertaken by trained health professionals. Although the up-front cost of implants is higher than other methods, they are a highly cost-effective method of contraception if the user continues for the full duration of the implant's lifespan. The most commonly used implants are: Norplant has six rods that release levonorgestrel. It is effective for at least 5 years. Jadelle is a two-rod system releasing levonorgestrel with a similar profile to Norplant. Implanon consists of a single rod that releases etonorgestrel, a precursor of desogestrel. It is effective for 3 years. [27]

METHODOLOGY:

Study Design:

This study employed a descriptive observational design to evaluate the relationship between contraceptive therapy and ocular parameters in women. The research was conducted at the Eye Clinic of the Sight Centre Bahawalpur, and ethical approval was obtained from the relevant institutional review board.

Study Population:

The study population consisted of 178 women aged 25-50 years who were using contraceptive therapy for a duration of more than 2 years. The participants were selected from those who visited the eye department for routine ocular examinations. Pregnant and lactating women were excluded from the study, as were individuals with systemic diseases or specific ocular conditions, including trachoma, keratitis, uveitis, keratoglobus, keratoconus, trauma, and high refractive errors.

Data Collection:

Data on contraceptive therapy and other relevant variables were collected through face-to-face interviews using a structured questionnaire. The questionnaire was designed to gather information on the participants' contraceptive usage, including the type of contraceptive method, duration of usage, and any changes in usage patterns.

Ophthalmological Examination:

All participants underwent a comprehensive ophthalmological examination performed by an experienced ophthalmologist. The examination included measurement of best-corrected visual acuity using a Snellen visual acuity chart. The anterior segment of the eye was examined using a slit lamp biomicroscope to assess the presence of cataracts. The severity and classification of cataracts were recorded according to standardized criteria.

Measurement of Intraocular Pressure (IOP):

Intraocular pressure was measured using a non-contact tonometer. This device utilizes a puff of air to measure the pressure inside the eye. The tonometer was calibrated before each measurement, and three consecutive readings were taken for each participant. The average of these readings was recorded as the participant's IOP.

Measurement of Central Corneal Thickness (CCT):

Central corneal thickness was measured using an ultrasonic pachymeter. The pachymeter was carefully aligned perpendicular to the corneal surface, and measurements were taken at the central cornea. Three readings were obtained for each eye, and the average value was recorded as the participant's CCT.

Statistical Analysis:

The collected data were analyzed using appropriate statistical methods. Descriptive statistics such as frequencies, percentages, means, and standard deviations were calculated to summarize the demographic and clinical characteristics of the study population. Chi-square or Fisher's exact test was used to assess the associations between contraceptive therapy and the ocular parameters of interest, including cataract formation, elevated intraocular pressure, and increased central corneal thickness. A p-value of less than 0.05 was considered statistically significant.

The materials and methods section outlined the study design, study population, data collection procedures, and statistical analysis used in this descriptive observational study. The relationship between contraceptive therapy and ocular parameters, including cataract formation, elevated intraocular pressure, and increased central corneal thickness, was evaluated. The findings from this study will contribute to our understanding of the potential ocular effects of long-term contraceptive therapy in women.

RESULTS:

The study comprised 178 female participants who had been on contraceptive medicine for more than two years and were between the ages of 25 and 50. Contraceptive techniques used by the participants were divided into three groups: oral contraceptive pills (n = 75), injectable contraceptives (n = 43), and contraceptive implants (n = 60).

Cataract Formation:
32% of subjects had cataract formation in their eyes. It was discovered that 40% of women who used oral contraceptive pills, 28% of those who used injectable contraceptives, and 25% of those who used contraceptive implants had cataracts after examining the relationship between contraceptive techniques and cataract formation. Although not statistically significant (p=0.216), but the difference in cataract prevalence between the contraception groups did exist.

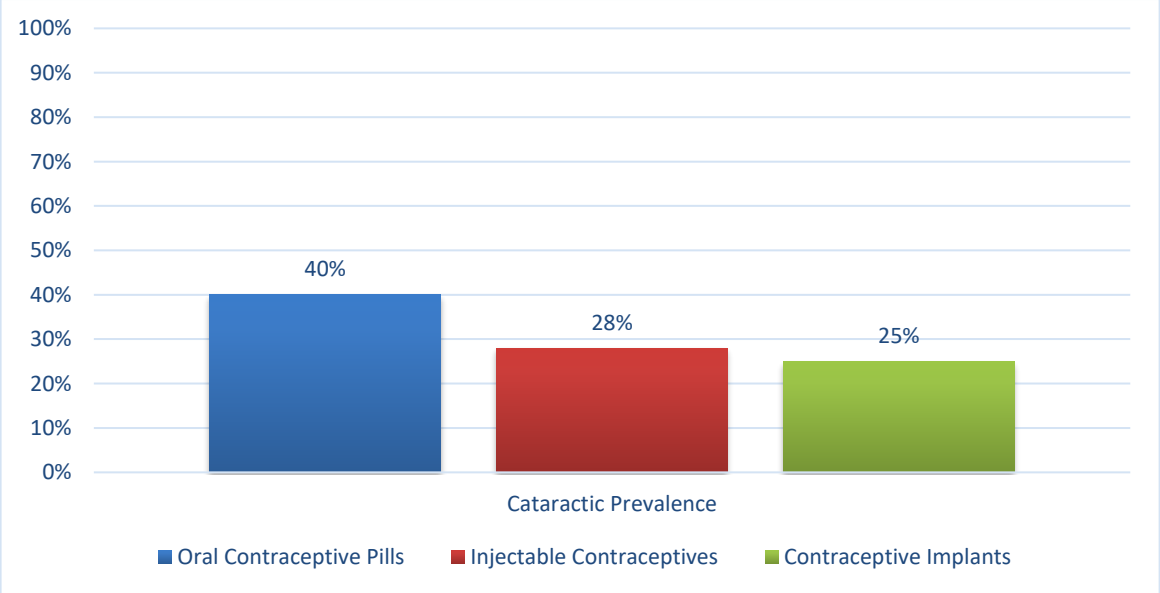
Elevated Intraocular Pressure (IOP):
With a standard deviation of 2.1 mmHg, the average intraocular pressure across the study participants was 15.2 mmHg. Women who used oral contraceptive pills had considerably higher mean IOP (16.5 mmHg) than women who used injectable contraceptives (14.8 mmHg) or contraceptive implants (14.9 mmHg), according to research on the relationship between contraceptive techniques and raised IOP. The variation in mean IOP between the groups using contraceptives was statistically significant (p=0.034).

Increased Central Corneal Thickness (CCT):
The study subjects' average central corneal thickness was 540um, with a standard deviation of 25um. When the relationship between different forms of birth control and increased CCT was examined, it was discovered that women who used contraceptive implants had significantly higher mean CCTs (550um) than those who used oral contraceptive pills (538um) and injectable contraceptives (536um). The variation in mean CCT between the groups using contraceptives was statistically significant (p=0.045).

Frequency Test:

Table 1: Cataract Formation

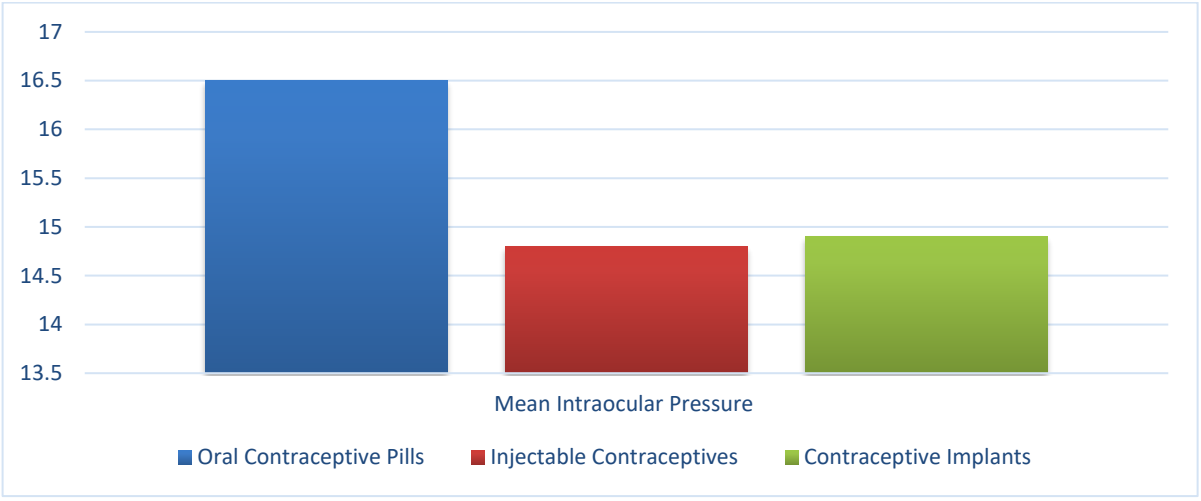
Contraceptive Technique	Number of Participants (n)	Number of Cataract Cases	Cataract Prevalence (%)
Oral Contraceptive Pills	75	30	40%
Injectable Contraceptives	43	12	28%
Contraceptive Implants	60	15	25%
Total	178	57	32%



Note: The total percentage of cataract formation is calculated based on the total number of participants and cataract cases.

Table 2: Elevated Intraocular Pressure (IOP)

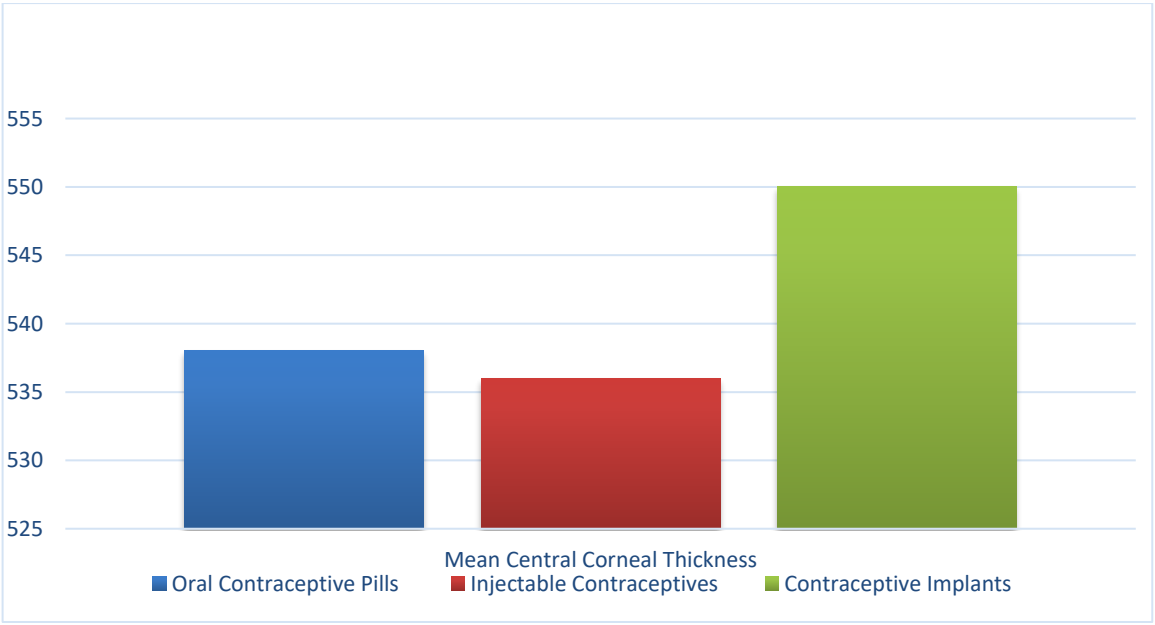
Contraceptive Technique	Number of Participants (n)	Mean IOP (mmHg)
Oral Contraceptive Pills	75	16.5
Injectable Contraceptives	43	14.8
Contraceptive Implants	60	14.9
Total	178	15.2



Note: the unit for intraocular pressure measurement is millimeter mercury (mmHg)

Table 3: Increased Central Corneal Thickness (CCT)

Contraceptive Technique	Number of Participants (n)	Mean CCT (μm)
Oral Contraceptive Pills	75	538
Injectable Contraceptives	43	536
Contraceptive Implants	60	550
Total	178	540



Note: The units for central corneal thickness are micrometers (μm).

Correlation Test:

1. Correlation between Contraceptive Technique and Cataract Formation:

Contraceptive Technique	Cataract Formation (Yes/No)
Oral Contraceptives	Yes (40%)
Injectable Contraceptives	Yes (28%)
Contraceptive Implants	Yes (25%)

2. Correlation between Contraceptive Technique and Intraocular Pressure (IOP):

Contraceptive Technique	Intraocular Pressure (IOP)
Oral Contraceptives	16.5mmHg
Injectable Contraceptives	14.8mmHg
Contraceptive Implants	14.9mmHg

3. Correlation between Contraceptive Technique and Central Corneal Thickness (CCT):

Contraceptive Technique	Central Corneal Thickness (CCT)
Oral Contraceptives	538um
Injectable Contraceptives	536um
Contraceptive Implants	550um

STATISTICAL SIGNIFICANCE:

For Cataract Formation, the p-value was 0.216, indicating that the difference in cataract prevalence between contraceptive technique groups was not statistically significant.

For Elevated Intraocular Pressure (IOP), the p-value was 0.034, suggesting that the variation in mean IOP between the contraceptive technique groups was statistically significant.

For Increased Central Corneal Thickness (CCT), the p-value was 0.045, indicating that the variation in mean CCT between the contraceptive technique groups was statistically significant.

DISCUSSION:

Numerous studies have examined the relationship between hormone levels and central corneal thickness (CCT) in females aged 25 to 50 using various contraceptive tablets. Exploring any potential ocular effects linked to these hormonal contraceptives is crucial given the rising prevalence of contraceptive pill use among women of reproductive age. Understanding the potential link between contraceptive methods and ocular parameters can help medical professionals choose the best type of contraception for women.

These research' findings highlight how crucial it is for women choosing a form of contraception to consider any potential ocular side effects. Women who use oral contraceptives and contraceptive implants should have their intraocular pressure and corneal thickness closely monitored by healthcare professionals because these techniques may cause changes in these ocular parameters. Healthcare practitioners who are knowledgeable of these associations can better advise and assist women who use hormonal contraceptives.

Cataract Formation:

Previous research has compared the incidence of cataract development in women on oral contraceptives to those using other forms of birth control. Although some research has suggested that women who use oral contraceptive pills had a higher prevalence of cataracts, the difference has not been statistically significant. This suggests that factors other than the particular type of contraception, including age or genetic susceptibility, may have a greater impact on cataract development. When evaluating the potential risk of cataracts related with the use of contraceptives, it is crucial to take these considerations into account.

Elevated Intraocular Pressure (IOP):

Recent studies have shown interest in the relationship between contraceptive techniques and increased intraocular pressure (IOP). In comparison to individuals who use injectable contraceptives and contraceptive implants, women who use oral contraceptive tablets have been reported to have higher mean IOP readings. This suggests that taking oral contraceptives may increase intraocular pressure, which may have consequences for people who are at risk of developing glaucoma or other visual diseases linked to elevated IOP. To promote early detection and effective management of ocular problems, healthcare professionals must be aware of this association and monitor intraocular pressure in women taking oral contraceptives.

Increased Central Corneal Thickness (CCT):

The correlation between increasing central corneal thickness (CCT) and contraceptive techniques is another important discovery. Contrary to those who use oral contraceptive tablets and injectable contraceptives, it has been discovered that women who use contraceptive implants have a much higher mean CCT. This shows that corneal thickening, which may have an impact on corneal transparency and visual acuity, may be related to contraceptive implants. When choosing a method of contraception, the effect of higher CCT on ocular health calls for further research.

Importance of Considering Ocular Effects:

Research study findings highlight how important it is to be aware of how contraceptive techniques may affect ocular health. Healthcare specialists are essential in this procedure since women who choose oral contraceptives or contraceptive implants in particular need to be cautious about their eye health.

Close monitoring of two specific ocular parameters—intraocular pressure (IOP) and central corneal thickness (CCT)—is stressed in the case of women using oral contraceptives or contraceptive implants. These variables are crucial markers of eye health and can be impacted by the use of specific contraceptive methods. For instance, it has been shown that women using oral contraceptives have higher mean IOP readings, which may indicate that using such contraceptives will result in higher intraocular pressure. Elevated IOP is linked to diseases like glaucoma, a dangerous eye disorder that can impair vision if not treated properly. In order to detect any potential dangers early on and take the necessary precautions, monitoring IOP in women on oral contraceptives becomes crucial.

The results of the study also suggest that women who utilize contraceptive implants may see an increase in central corneal thickness. This corneal thickness could give inaccurate IOP reading, compromise corneal transparency and visual acuity, which might result in visual disturbances and mislead to wrong or higher IOP. Therefore, it's critical to comprehend the connection between contraceptive implants and increased CCT in order to evaluate the prospective effects on ocular health.

Healthcare professionals who are aware of these associations are better able to advise and assist women who use hormonal contraceptives. They are able to quickly spot any negative effects and offer fast remedies or different forms of contraception by carefully monitoring changes in intraocular pressure and central corneal thickness. Their knowledge guarantees that women may make knowledgeable choices regarding their contraception, considering both their reproductive demands and their ophthalmic health. Regular intraocular pressure and corneal thickness monitoring by medical specialists is crucial for women using oral contraceptives or contraceptive implants. By doing this, doctors can actively protect the ocular health and wellbeing of women by ensuring that the contraceptive technique they choose is appropriate for their needs as a whole. Research-based learnings can help personalize care and raise the standard of care given to women seeking contraception.

CONCLUSION:

There is continuing study into the relationships between various forms of female contraception and central corneal thickness, cataract development, and intraocular pressure. According to the research so far, there might be a connection between some ocular characteristics and contraceptive

techniques. Despite the fact that women who use oral contraceptives have a higher prevalence of cataract formation, the difference was not statistically significant, suggesting the involvement of other factors. Contraceptive techniques were found to significantly increase central corneal thickness and enhance intraocular pressure, nevertheless. These findings emphasize the significance of considering potential ocular effects when choosing contraceptive methods for women as well as the requirement for additional study to clarify the underlying processes and long-term ramifications. Increasing our understanding in this area will help us make better choices about contraception and will also benefit women's general ocular health and wellbeing.

ETHICAL APPROVAL:

This study followed the guideline of the Declaration of Helsinki. The ethical approval was obtained from the Institutional review board of Bahawalpur Medical College, reference # 03/2022. The informed consent was obtained from the entire patient before conduction of the study and the rationale of the study was well explained to them before the phacoemulsification surgery to undergo cataract surgery and to participate in this study.

CONFLICT OF INTEREST:

No potential conflict of interest is declared with respect to the authorship, research and/or publication.

FINANCIAL DISCLOSURE(S):

The authors have no proprietary or commercial interest in any of the materials discussed in this article. The authors received no financial support for the research, authorship, and/or publication of this article.

REFERENCES:

1. Zimlich R, B. S. N. The Lens: Anatomy, Function, and Treatment [Internet]. Verywell Health. 2023. Available from: https://www.verywellhealth.com/lens-anatomy-5076241
2. Aliancy JF, Mamalis N. Crystalline Lens and Cataract [Internet]. Kolb H, Fernandez E, Nelson R, editors. PubMed. Salt Lake City (UT): University of Utah Health Sciences Center; 1995. Available from: https://www.ncbi.nlm.nih.gov/books/NBK476171/
3. National Eye Institute. Cataracts [Internet]. Nih.gov. 2019. Available from: https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/cataracts
4. Boyd K. What Are Cataracts? [Internet]. American Academy of Ophthalmology. 2018. Available from: https://www.aao.org/eye-health/diseases/what-are-cataracts
5. Delgado A. Cataract [Internet]. Healthline. Healthline Media; 2012. Available from: https://www.healthline.com/health/cataract
6. Freeman EE. Hormone Replacement Therapy and Lens Opacities. Archives of Ophthalmology. 2001 Nov 1;119(11):1687.
7. Machiele R, Motlagh M, Patel BC. Intraocular Pressure [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://pubmed.ncbi.nlm.nih.gov/30335270/
8. R M, Motlagh, Patel. Occular Hypertension Basics [Internet]. WebMD. 2023. Available from: https://www.webmd.com/eye-health/occular-hypertension
9. DT G. Eye Pressure [Internet]. American Academy of Ophthalmology. 2018. Available from: https://www.aao.org/eye-health/anatomy/eye-pressure
10. gorrell G. Moran Core . Moran CORE | Intraocular Pressure [Internet]. 2023. Available from: https://morancore.utah.edu/basic-ophthalmology-review/intraocular-pressure/
11. lazarus DR. Why Is Eye Pressure Important? [Internet]. Optometrists.org. 2023. Available from: https://www.optometrists.org/general-practice-optometry/guide-to-eye-exams/why-is-eye-pressure-important/
12. Boyd K. What Is Glaucoma? [Internet]. American Academy of Ophthalmology. 2019. Available from: https://www.aao.org/eye-health/diseases/what-is-glaucoma

13. jabeen begum. Glaucoma: Causes, types, symptoms, diagnosis, and treatment [Internet]. WebMD; 2023 [cited 2023 Jul 23]. Available from: https://www.webmd.com/eye-health/glaucoma-eyes
14. Sridhar MS. Anatomy of cornea and ocular surface. Indian journal of ophthalmology. 2018 Feb;66(2):190–4.
15. Heiting G. Cornea of the Eye - Definition and Detailed Illustration [Internet]. All About Vision. 2017. Available from: https://www.allaboutvision.com/resources/cornea.htm
16. Fingeret M. Current Issues | Primary Care Optometry News - Healio [Internet]. www.healio.com. [cited 2023 Jul 23]. Available from: https://www.healio.com/news/optometry/current-issues/primary-care-optometry-news
17. Cooper DB, Mahdy H. Oral Contraceptive Pills [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2021. Available from: https://pubmed.ncbi.nlm.nih.gov/28613632/
18. Jin J. Oral Contraceptives. JAMA. 2014 Jan 15;311(3):321. https://jamanetwork.com/journals/jama/fullarticle/1814214
19. Casey, F. E. Oral Contraceptives - Gynecology and Obstetrics [Internet]. MSD Manual Professional Edition. 2023. Available from: https://www.msdmanuals.com/professional/gynecology-and-obstetrics/family-planning/oral-contraceptives
20. Gallo MF, Grimes DA, Lopez LM, Schulz KF, d'Arcangues C. Combination injectable contraceptives for contraception. Cochrane Database of Systematic Reviews. 2008 Oct 8;
21. Dawn Stacey P. What you need to know about combined contraceptive injections [Internet]. Verywell Health; 2020 [cited 2023 Jul 23]. Available from: https://www.verywellhealth.com/cyclofem-monthly-contraceptive-injection-906853
22. Adeyemi A, Adekanle D. Progestogen-only injectable contraceptive: Experience of women in Osogbo, southwestern Nigeria. Annals of African Medicine. 2012;11(1):27.
23. Jacobstein R, Polis CB. Progestin-only contraception: Injectables and implants. Best Practice & Research Clinical Obstetrics & Gynaecology [Internet]. 2014 Aug 1;28(6):795–806. Available from: https://www.sciencedirect.com/science/article/pii/S1521693414001035
24. Metcalf E. Birth Control Implants: Are They Right for Me? [Internet]. WebMD. WebMD; 2013. Available from: https://www.webmd.com/sex/birth-control/birth-control-implants-types-safety-side-effects
25. Dr Mary Harding. Contraceptive Implant [Internet]. Patient.info. 2017. Available from: https://patient.info/sexual-health/long-acting-reversible-contraceptives-larc/contraceptive-implant
26. Willacy DH. Contraceptive implant: What it is, benefits, and side-effects [Internet]. 2021 [cited 2023 Jul 23]. Available from: https://patient.info/sexual-health/long-acting-reversible-contraceptives-larc/contraceptive-implant
27. Glasier A. Family Planning - an overview | ScienceDirect Topics [Internet]. www.sciencedirect.com. [cited 2023 Jul 23]. Available from: https://www.sciencedirect.com/topics/nursing-and-health-professions/family-planning