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RESEARCH ARTICLE

COMPARISON BETWEEN PRE-OP & POST-OP CENTRAL CORNEAL THICKNESS AND CORNEAL COMPENSATED IOP (BY NON-CONTACT TONOMETRY) AFTER CLEAR CORNEAL PHACOEMULSIFICATION

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ABSTRACT

Background: In recent years, the success ratio in cataract surgery has significantly increased as a result of advances in surgical methods and equipment[1-2].It is known that cataract surgery alters the ocular biomechanical properties. The aim of this study is to compare the central corneal thickness and IOP pre-op and post-op phacoemulsification cataract surgery.

Methods: We included 50 patients in our study with cataract above 50 years of age. The phacoemulsification cataract surgery was performed by same surgeon with the identical material in all study subjects. Central corneal thickness, corrected IOP is measured in all the study subjects prior to surgery, on post-op day1, post-op day 7 and post-op day 30. Statistical analysis was done in measurements.

Result: There were 60% males and 40% females in study group. We found the mean CCT prior to surgery was 546.8±34.7µ, that increased to 645.0±165.3 µ on post-op day 1, changed to 597.1±98.5µ post-op day 7, decreased to 551.4±44.7µ post-op day 30. The mean corrected IOP prior to surgery was 17.0±2.9 mmHg, changed to 17.8±4.2 mmHg on post-op day 1, changed to 17.2±2.0 mmHg on post-op day 7, decreased to 15.4±1.9 mmHg on post-op day 30.

Conclusion: Central corneal thickness increases immediately after phacoemulsification cataract surgery, tends to normal over 30 days. Corrected IOP is a reliable parameter in post-operative period. Corrected IOP decreases after phacoemulsification cataract surgery.

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INTRODUCTION

Various researchers have investigated different anterior segment parameters after uneventful phacoemulsification, using both qualitative and quantitative methods (Koranyi, 2002). Clinical investigations have demonstrated that cataract extraction causes deepening of the anterior chamber, widening of the anterior chamber angle, and a decrease in intraocular pressure (IOP) (Altan, 2004). Cataract surgery is the commonest surgical procedure performed worldwide (Franchini, 2008). Central corneal thickness (CCT) increases significantly immediately after cataract surgery and gradually returns to normal values over the next few weeks (Salvi, 2007 and Falkenberg, 2005). After phacoemulsification surgery values of intraocular pressure (IOP) are reduced between 1–5 mmHg after surgery compared to the situation before surgery (Pera¨ salo, 1997).

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During the first 24 hours after the operation, an elevation of IOP is common, and those eyes with high preoperative IOP values are more likely to have higher IOP spikes shortly after surgery (O'Brien, 2007). Patients with coexisting glaucoma manage with no or less medication after cataract surgery (Pera¨ salo, 1997). The evaluation of anterior segment parameters may provide useful information that contributes towards our understanding of ocular pharmacokinetics, aqueous humour dynamics, primary open-angle glaucoma, primary angle-closure glaucoma (PACG) and pigmentary glaucoma. In addition, quantitative documentation of any alterations in anterior segment parameters may add, either directly or indirectly, to the knowledge base that supports intraocular lens (IOL) power calculation, piggyback IOL implantation techniques and IOL exchange surgery.

Type of the study

The Clinical Comparative study.

Inclusion criteria

1. Age >50 years
2. Patients suitable for phacoemulsification surgery
3. Indication of surgery being cataract

Exclusion criteria

1. Patients having mature cataract
2. Patients with primary, secondary glaucoma ,ocular hypertension & glaucoma suspect
3. Patients with corneal & ant. Segment pathology along with cataract
4. Persons who have undergone ocular surgeries in past
5. Patients having IOP more than 20, before surgery
6. Patients with previous history of refractive surgery
7. Patients who are chronic contact lens wearer

MATERIALS AND METHODS

Informed consent was taken from all the participants before surgery. Authors will adhere to the tenets of the Declaration of Helsinki during study. After general ophthalmologic examination, specific ophthalmic investigations like slit lamp biomicroscopic examination, intraocular pressure on non-contact Tonometry, pachymetrywas done. Comprehensive investigations were under taken including patient's age, gender, medical & ocular history. Routine investigations & pre anaesthetic check-up were done.

Cataract surgery was performed under suitable anaesthesia by temporal clear corneal Phacoemulsification surgery with rigid 5.25 mm PCIOL implantation done by experienced phaco-surgeon. Identical materials were used for each procedure, a clear corneal incision is to be taken parallel to the limbus was anterior chamber was entered at a distance of approximately 2.0 mm from limbus. All Phaco emulsification procedures were performed using the "Stop – and – chop" technique. Central corneal thickness and IOP were taken prior to surgery, post-op day 1, post-op day 7 and post-op day 30.

Facilities/Equipment used

Zeiss & Topcon Slit-lamp
Topcon Non contact tonometer
Tomeypachymeter
Zeiss visu -160 operating microscope
AMO white star phacomachine.

Risk Factors: Corneal abrasion while doing pachymetry.

Statistical Analysis

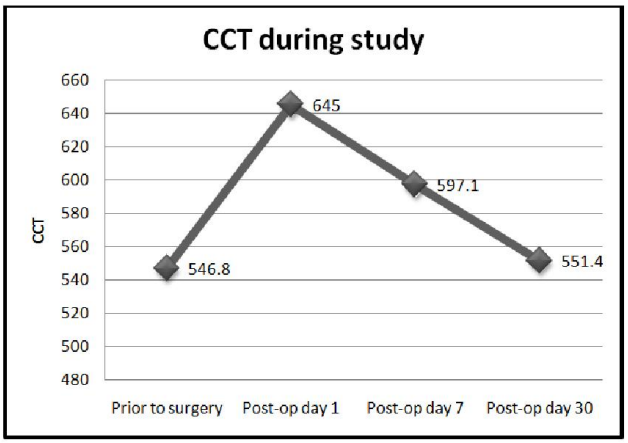
Statistical analysis was performed using Statistical Package for Social Sciences (SPSS, SPSS Inc., Chicago, IL, USA) version 18.0.

RESULTS

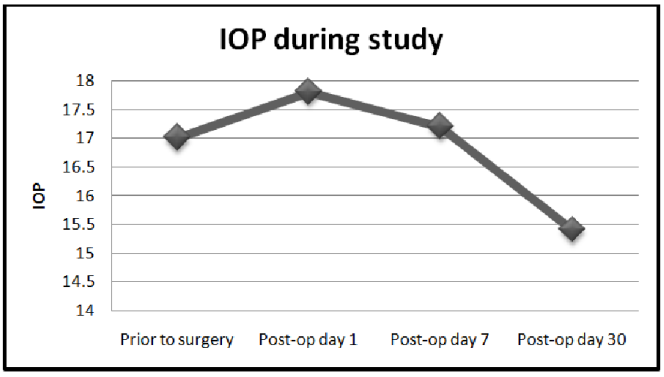
We included total 50 patients in our study. Age wise distribution was as follows.

Age	Number of patients	
	Male	Female
50-60 yrs	14	10
60-70 yrs	11	7
>70 yrs	5	3

Among them 60% were males and 40% were female patients.



The mean CCT prior to surgery was 546.8±34.7µ, that increased to 645.0±165.3 µ on post-op day 1, changed to 597.1±98.5µ post-op day 7, decreased to 551.4±44.7µ post-op day 30. There was statistically significance difference between the values on post-op day 1 and post-op day 7 ($p<0.05$). But there was no statistically significant change in prior to surgery values and post-op 30 day value. The mean IOP prior to surgery was 17.7±2.7 mmHg. That increased to 24.9±7.4 mmHg on post-op day 1, changed to 22.5±4.7 mmHg on post-op day 7, decreased to 15.7±3.0 mmHg on post-op day30.



But the mean corrected IOP prior to surgery was 17.0±2.9 mmHg, changed to 17.8±4.2 mmHg on post-op day 1, changed to 17.2±2.0 mmHg on post-op day 7, decreased to 15.4±1.9 mmHg on post-op day 30. Though the IOP seemed to increase after surgery and decreased to normal level, the corrected IOP showed a constant trend of decrease over the time. But there was statistically significance difference between prior to surgery corrected IOP value and post-op day 30 value ($p<0.05$).

DISCUSSION

It is known that cataract surgery alters the ocular biomechanical properties, and although the mechanics of

changes are not completely understood, the structurally altered cornea may influence refractive outcomes (Kucumen *et al*., 2008). Accurate measurement of IOP is fundamental parameter in any ophthalmic examination. Over the past decades, Goldman applanation tonometry is the gold standard. However, the accuracy of Goldman tonometry depends on various factors, including CCT, corneal curvature, biomechanical properties (Hager *et al*., 2008). We recommend not treat immediate post-op increased IOP, because that may be elevated because of increase in corneal thickness. Corrected IOP should be considered before treatment.

Also, Tranos *et al*. (2004), recommend not treating postoperative IOP spikes in healthy eyes as there is no compelling evidence to suggest that transient IOP spikes produce significant permanent damage. Studies (Podolsky *et al*., 1981 and Galin, 1978) have shown that cataract surgery is associated with transient elevated IOP (IOP spikes) in the immediate postoperative period. Tranos *et al*. (2004), reported a 25% incidence of IOP spikes (30 mm Hg) 4 to 6 hours after uneventful phacoemulsification and intraocular lens implantation. However, in all cases the IOP was within normal limits (21 mm Hg) 1 month later. Ahmed *et al*. (2002) reported IOP greater than 28 mm Hg in 18% of patients without glaucoma in the early (3 to 7 hours) postoperative period; the IOP decreased to below preoperative levels by 4 days in most cases. These findings correlate with our finding of a reversible increase in the CCT in the immediate postoperative period. Our study is comparable with the other studies done by Tanveer *et al*. (2015), Salvi *et al*. (2007).

Conclusion

Central corneal thickness increases immediately after phacoemulsification cataract surgery, tends to normalise over 30 days. Corrected IOP is a reliable parameter in post-operative period. Corrected IOP decreases after phacoemulsification cataract surgery.

REFERENCES

Ahmed, I.I.K., Kranemann, C., Chipman, M., Malam, F. 2002. Revisiting early postoperative follow-up after phacoemulsification. *J Cataract Refract Surg*; 28:100–108

Altan, *et al*. 2004; Kashiwagi *et al*. 2006; Memarzadeh *et al*. 2007

Falkenberg, B., Kutschan, A., Wiegand, W. 2005. Analysis of optical parameters after cataract surgery and implantation of foldable lens. Der Ophthalmology: Zeitschrift der Deutschen Ophthalmologischen Gesellschaft; 102: 587-91.

Franchini, A., Frosini, S., Boddi, V. 2008. Standard coaxial phacovsmicroincision cataract surgery: a corneal endothelium study. *Int J Ophthalmol*., 1(4):344–350.

Galin, M.A., Lin, L.L.K., Obstbaum, S.A. 1978. Cataract extraction and intraocular pressure. Trans OphthalmolSoc UK; 98:124–127

Hager, A., Loge, K., Schroeder, B., Fullhas, M.O.<Wiegand, W. 2008. Effect of central corneal thickness and corneal hysteresis on tonometry as measured by dynamic contour tonometry, ocular response analyser, and Goldman tonometry in glaucomatous eyes. *J Glaucoma*. 17(5)361-365

Jiang, T., Jiang, J., Zhou, Y., Zhao, G.Q., Li, H., Zhao, S.Y. 2011. Cataract surgery in aged patients: phacoemulsification or small-incision extracapsular cataract surgery. *Int J Ophthalmol*. 4(5):513–518.

Koranyi *et al*. 2002; Altan *et al*. 2004; Kashiwagi *et al*. 2006; Memarzadeh *et al*. 2007; Miyata *et al*. 2007

Kucumen, R.B., Yeneral, N.M., Gorgun, E, *et al*. 2008. Corneal biomechanical properties and intraocular pressure changes after phacoemulsification and intraocular lens implantation. *J Cataract Refract Surg*;34(12):2096-2098

O'Brien *et al*. 2007), but 1 week later, the pressure is lower than before the operation (Pohjalainen *et al*. 2001

Pera¨ salo 1997; Kim *et al*. 1999; Shingleton *et al*. 1999; Link *et al*. 2000; Pohjalainen *et al*. 2001; Mathalone *et al*. 2005

Pera¨ salo, 1997. Tong & Miller 1998, Shingleton *et al*. 1999, Link *et al*. 2000; Mannes &Zeyen 2001

Podolsky, M.M., Ritch, R. 1981. Elevated intraocular pressure in the immediate postoperative period after cataract extraction. Ann Ophthalmol; 13:1239–1240

Salvi, S.M., Soong, T.K., Kumar, B.V., Hawksworth, N.R. 2007. Central corneal thickness changes after phacoemulsi-fication cataract surgery. *Journal of cataract and refractive surgery*; 33: 1426-8.

Salvi, S.M., Soong, T.K., Kumar, B.V., Hawksworth, N.R. 2007. Central corneal thickness changes after phacoemulsification cataract surgery. *J Cataract Refract Surg;* 33(8):1426–1428

TanveerAnjumChaudhry, Muhammad Hamza, WajihaKoomal, Khabir Ahmad. 2015. Central Corneal Thickness Changes after Phacoemulsification. *Pak J Ophthalmol*, Vol. 31 No. 2

Tranos, P., Bhar, G., Little, B. 2004. Postoperative intraocular pressure spikes: the need to treat. Eye ; 18:673–679

Tranos, P., Wickremasinghe, S., Hildebrand, D., *et al*. 2003. Same-day versus first-day review of intraocular pressure after uneventful phacoemulsification. *J Cataract Refract Surg* 2003; 29:508–512

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