e-ISSN: 0975-5160, p-ISSN: 2820-2651

Available online on www.ijtpr.com

International Journal of Toxicological and Pharmacological Research 2023; 13(2); 49-52
Original Research Article

Comparative Study on Outcome of Cataract Surgery in Diabetic and Non Diabetic Patients

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Received: 10-12-2022 / Revised: 05-01-2023 / Accepted: 30-01-2023
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Conflict of interest: Nil

Abstract

Introduction: Diabetes mellitus (DM) is metabolic disorder affects multi organs. Age wise DM with < 40 years is 15 – 25 more risky in developing cataract. With this back ground, a study was conducted to find the outcome of cataract surgery in diabetics and its comparison with non DM.

Method: It was a comparative study on the diabetic and the non-diabetic group that underwent small incision cataract surgery with posterior chamber intraocular lens implantation. Age, sex, surgical technique, follow up, pre- and postoperative best corrected visual acuity (BCVA) and post-op complications were evaluated. Chi-square ($\chi 2$) test was used for association between two categorical variables. $P < 0.05$ was considered to be statistically significant.

Results: Group wise, 58 members were included both in DM and non DM, respectively. The mean $\pm$ SD age in DM group was 54.9 $\pm$ 6.9 and non DM, it was 58.2 $\pm$ 5.0; statistically there was no significant difference. Hypertension was the leading comorbid condition; 18 and 1, respectively in groups. In the DM group, the mean best corrected visual acuity (BCVA) was 1.52 ± 0.8 and in non DM group, it was 1.60±0.82; statistically there was no significant difference. The mean post-operative BCVA values were, 0.38±0.3 and 0.35±0.25, respectively in DM and non DM groups; statistically there was no significant difference. Whereas when the pre and post-surgical BCVA values were compared, statistically there was significant difference, respectively in the groups.

Conclusion: The pre-operative BCVA was compared to the post-operative values in in both the groups, respectively. Therefore, small incision cataract surgery in DM without diabetic retinopathy yields similar visual outcomes those without DM. However large sample size studies are commended.

Keywords: Cataract, Diabetes, Participant, Mean.

Introduction

Diabetes mellitus (DM) is metabolic disorder affects multi organs; around 20% of all cataract surgery are among the individuals with DM. [1] Cataract is one of the earliest complications of DM. there is 2 – 5 times chance for developing cataract among DM compared to non DM. [2]

Age wise DM with < 40 years is 15 – 25 more risky in developing cataract. [3] Progression of diabetic retinopathy also

may lead to renal diseases. High blood sugar level is associated with loss of lens transparency among the DM individuals. [4] Diabetes affects the metabolic, physiological as well as morphological properties of the cornea. In addition there will be lower base line density without much difference in the central corneal thickness. Increase in the incidence of DM in the developing countries like India necessitates an assessment of the surgical outcome of diabetic cataract.

With this back ground, a study was conducted to find the outcome of cataract surgery in diabetics and its comparison with non DM.

Methods

It was a comparative study, conducted in the department of Ophthalmology, KIMS, Amalapuram. Study protocol was approved by the Institutional Ethical Committee. An informed written consent was taken from all the participants. Individuals between 40 – 65 years, type 2 DM were included in this research. Those with uncontrolled DM, traumatic or complicated cataract and non-cooperative individuals were not considered in this research.

The study members were admitted in the hospital one day prior to cataract surgery. Initially pre-operative evaluation along with complete ophthalmic examination and thorough history with required demographic data were carried. Systemic evaluation was also carried simultaneously. Ophthalmic examination include, corrected visual acuity, slit lamp examination along with grading of cataract, biometry for IOL, posterior segment evaluation using Indirect ophthalmoscopy and B scan, if required. In addition to this blood glucose was analysed along with viral markers, as part of institutional protocol.

Best corrected visual acuity 2. Slit lamp examination and grading of cataract done according to LOCS III. 3. Biometry for IOL calculation using which includes Keratometry using keratometer and Axial length measurement using A- Scan and IOL calculation using SRK II/T formula. 4. Posterior segment evaluation using indirect ophthalmoscopy, B- Scan and OCT if required. Gatifloxacin eye drops were instilled 4 times on day before cataract surgery. For Preoperative pupillary dilatation, Tropicamide and phenylephrine and nepafenac ophthalmic drops were instilled alternatively every 15 minutes, an hour prior to surgery. Anaesthesia was achieved by peri-bulbar block of 8 ml mixture of 2% xylocaine and hyaluronidase (1500 IU). Small incision cataract surgery with posterior chamber intraocular lens implantation under the peri bulbar anaesthesia was carried.

On the post-operative day, detailed slit lamp examination and fundus examination were carried. Visual acuity was assessed and discharged on day 2 or 3. At the time of discharge, corticosteroids and antibiotic combination drops 6 times a day, tapered over a period of 6 weeks. All were asked to review at 1 week and 1 month. Visual acuity was recorded on every visit.

Statistical analysis: Data were analysed using SPSS version 23.0. For continuous variables, mean± standard deviation (SD) were used. For categorical data, the number and percentage were used. Chi-square ($\chi 2$) test was used for association between two categorical variables. $P < 0.05$ was considered to be statistically significant.

Results

Total 122 members were recruited in this, 6 were not considered for analysis for various reasons. The data were analysed with 116 (100%). Group wise, 58 members were included both in DM and non DM, respectively. The mean $\pm$ SD age in DM group was 54.9 $\pm$ 6.9 and non DM, it was 58.2 $\pm$ 5.0; statistically there was no significant difference. Gender wise, in DM group, 28 were male and 30 female participants; whereas in non DM group, it was 20 and 38, respectively. Statistically there was significant difference.

Hypertension was the leading comorbid condition; 18 and 1, respectively in groups. In the DM group, the mean best corrected visual acuity (BCVA) was 1.52 ± 0.8 and in non DM group, it was 1.60±0.82; statistically there was no significant difference. The mean post-operative BCVA values were, 0.38±0.3 and 0.35±0.25, respectively in DM and non DM groups; statistically there was no significant difference. Whereas when the pre and post surgical BCVA values were compared, statistically there was significant difference, respectively in the groups.

Discussion:

In this research 40 – 65 years age was considered; 51 – 60 years age was the leading. At this category, 28 members were in DM and 33 non DM. The mean ± SD age in DM group was 54.9 ± 6.9 and non DM, it was 58.2 ± 5.0; statistically there was no significant difference. One of the Indian studies reported that there was more prevalence of cataract in the DM and < 65 age is most vulnerable. [5]

In thus research, when gender was considered, in DM group, 28 were male and 30 female participants; whereas in non DM group, it was 20 and 38, respectively. Statistically there was significant difference. No specific reasons were found for more female numbers, respectively in both groups, may be the blood sugar levels was the cause. Because the mean blood sugar levels were more among the female gender. Similar findings were reported in the literature also. [6]

In this study, the duration of hyper glycemia was also analysed, Majority (33) of the study members were recently and the duration was < 3 years; 9 members for >10 years and the rest between 3 – 10 years. The risk of cataract formation can increase with the duration of diabetes. [7 – 9] But the exact mechanism related to the duration of DM and development of cataract is not clear, may be some changes in lens proteins.

Hypertension was the leading comorbid condition in this research; 18 and 1, respectively in groups. As per the literature also, close association was reported between DM and hypertension. High incidence of this was also reported in the research. As per Onakpoya H Oluwatoyin et al. [10] study, in DM hypertension was seen in 61% whereas it was 26% among the non DM. Whereas, it was reported to be 55% and 68%, respectively in the research reported by Squirrel et al. [11] and Alsarhani et al. [12]

In the DM group, the mean best corrected visual acuity (BCVA) was 1.52 ± 0.8 and in non DM group, it was 1.60±0.82; statistically there was no significant difference. The mean post-operative BCVA values were, 0.38±0.3 and 0.35±0.25, respectively in DM and non DM groups; statistically there was no significant difference. Whereas when the pre and post-surgical BCVA values were compared, statistically there was significant difference, respectively in the groups. When pre-operative and post-operative visual acuity was compared, in both the groups there was statistically significant difference. This indicate that cataract surgery in DM without retinopathy led better and comparable visual outcome to that of individuals without DM. It was also reported that cataract surgery in DM yields better results. [13, 14,15]

Conclusion

The pre-operative BCVA was compared to the post-operative values in in both the groups, respectively. Therefore, small incision cataract surgery in DM without diabetic retinopathy yields similar visual outcomes those without DM. However large sample size studies are commended.

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