Section: Opthalmology

Research

A COMPARATIVE STUDY OF CATARACT SURGERY IN DIABETIC AND NON-DIABETIC PATIENTS

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Abstract

Background: Cataract is one of the main causes of blindness. Cataract is present in almost two thirds of diabetics. The anatomy and performance of the ocular lens are impacted by diabetes mellitus. A risk factor for cataract development is diabetes mellitus. After diabetic retinopathy, cataract is the second most frequent visual consequence of diabetes mellitus. Compared to non-diabetics, diabetic people have cataracts at an earlier age and 2–5 times more frequently. Thus, cataract surgery is frequently performed sooner in diabetics. **Materials and Methods:** The study's participants were chosen from the Government Medical College in Jagdalpur, Chhattisgarh's Bastar region. The research was carried out from MAY 2022 to OCTOMBER 2022 over a six-month period.32 subjects in all were enrolled in this investigation. A study including participants between the ages of 45 and 70 was conducted. Diabetic and non-diabetic groups participated in the study. The study participants who had cataract surgery with a posterior chamber intraocular lens implant and peri-bulbar block. **Result:** Out of 42 diabetic subjects, 24 were of senile type of cataract, 3 were of posterior sub capsular cataract and 15 were of snowflake cataract. Out of 42 non diabetic subjects 20 were of senile type of cataract and 2 were of posterior sub capsular cataract and 20 were of snowflake cataract. Out of 42 diabetic subjects 17 were males and 25 were females. Out of 42 non diabetic subjects 10 were males and 32 were females. **Conclusion:** No significant difference in the final visual outcome between the diabetic and non-diabetic group. In conclusion, small incision cataract surgery in diabetics offers favorable and comparable visual outcomes with non-diabetic group.

INTRODUCTION

The most prevalent cause of blindness in the world is cataract. Among all eye illnesses, the prevalence of cataract blindness varies from 5% in wealthy nations to 50% or higher in underdeveloped and/or rural areas. Patients with diabetes mellitus (DM) have a 2–5 times higher risk of developing a cataract, which can increase to 15–25 times in diabetics under 40. Central cataract obstructing retinal screening and subsequent laser application have been the most frequent causes of ungradable images on mydriatic fundus cameras for retinal screening. A higher rate of complications, such as PCO, fibrinous uveitis, anterior segment neo-vascularization, and cystoids macular edema, are experienced by DM patients after cataract surgery.[1] Patients with diabetes have the same preoperative evaluation as other cataract patients, but the presence and severity of diabetic eye abnormalities are given extra consideration. Individuals with diabetes frequently appear with cataracts at an early age because they are more likely to acquire posterior sub capsular cataracts than other patients and tend to develop cataracts earlier overall. It is crucial to prove that the level of cataract observed matches the patients' reported visual impairment and visual acuity. When a patient complains of serious vision issues but an examination reveals just minor cataracts, one must thoroughly examine the retina for other potential causes of visual loss.[2]

Diabetes mellitus, more generally known as diabetes, is a collection of metabolic illnesses characterized by high blood sugar levels. Ophthalmic consequences such diabetic retinopathy and cataract can result in severe vision loss or even blindness. Additionally, diabetes is linked to aberrant tear quantity and quality as well as goblet cell loss, all of which are crucial for maintaining the proper function of the tear film. However, a thorough investigation of how cataract surgery affects diabetic individuals' tear film function is

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lacking. Only one study has, to date, examined how diabetic individuals' tear films and tear secretions alter after cataract surgery.[3]

One of the most popular ocular procedures is cataract extraction. Recent advancements in surgical technique, lens design, and technology have improved the results of cataract surgery. The favored method at the moment is phacoemulsification, which involves making small incisions and implanting a foldable intraocular lens (IOL). This is an effective technique, and successful surgery is typically accompanied by pleasing visual outcomes. However, postoperative vision may not be as good if cystoids macular edema (CME) develops. Even after straightforward cataract surgery, this can happen in patients with ocular diseases like uveitis or diabetic retinopathy.[4]

Preoperative risk factors for diabetic patients having cataract surgery were discussed by A et al, along with the proper nursing interventions for these patients. A study of the literature was done on the relationship between risk variables and diabetes patients' cataract surgery results in terms of complications, visual acuity, and visual functionality. Examined were preoperative risk factors and surgical side effects, such as inflammation and cystoids macular edema (CME). The role of the nurse as educator and advocate was further examined in terms of their impact on the patient's diabetes care to improve visual outcomes in order to stress the evidence of best practices. The risk of intraoperative and postoperative complications may be higher in diabetic patients who are older, have a history of diabetic retinopathy, are on insulin, and have elevated Hb A1C values.[5]

MATERIALS AND METHODS

The subjects for the study were selected from Government Medical College Jagdalpur, Bastar district, Chhattisgarh. The study conducted for a period of six months from from MAY 2022 to OCTOMBER 2022. Total number of Subjects included in this study was 32. Study was carried out among the people aged 45 to 70 years. Informed consent form was taken from all the participants included in this study. The study was conducted among 2 group's diabetic and non diabetic. All patients were checked into the hospital the day before their procedures. All of these patients had a comprehensive eye examination, a thorough medical, demographic history, systemic examination was done. The study subjects that undergone peri-bulbar block and minor incision cataract surgery with posterior chamber intraocular lens implantation. Analysis was done on the distribution of patients by age and sex, glycemic control, preoperative visual acuity, coexisting morbidities, procedural complications, and ultimate visual result.

Inclusion Criteria

- Patients with type 2 diabetes mellitus.
- Age group of 40 – 70 years was included.
- Patients who gave consent and were cooperative were included in the study.

Exclusion Criteria

- Patients with traumatic or complicated cataract.
- Uncontrolled diabetes.

Statistical Analysis

Statistical analysis for this study was done by using statistical software SPSS version 16.

RESULTS

[Table 1] shows age distribution of study groups. Out of 42 diabetic subjects 4 were between the age group of 45 – 50 years and 17 were between the age group of 50 – 60 years and 21 were between 60- 70 years of age. More number of subjects are in between 60 – 70 years of age. Out of 42 non diabetic subjects, 1 was in the age group of 45 – 50 years of age, 18 were between the age group of 50 – 60 years of age and 23 were in between 60 – 70 years of age.

[Table 2] shows sex distribution of study groups. Out of 42 diabetic subjects 17 were males and 25 were females. Out of 42 non diabetic subjects 10 were males and 32 were females.

[Table 3] shows cataract type in diabetic and non diabetic subjects. Out of 42 diabetic subjects, 24 were of senile type of cataract, 3 were of posterior sub capsular cataract and 15 were of snowflake cataract. Out of 42 non diabetic subjects 20 were of senile type of cataract and 2 were of posterior sub capsular cataract and 20 were of snowflake cataract.

[Table 4] shows risk factors associated with non-diabetic cataract subjects. Out of 42 non diabetic subjects, 12 were subjected to trauma, 25 were of hypertension and 5 were of dislipidemia.

Table 1: Age Distribution of Study Groups

Age	Diabetic	Non-Diabetic
45 – 50 years	04	01
50 – 60 years	17	18
60 – 70 years	21	23
Total	42	42

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Table 2: Sex Distribution of Study Groups.

Sex	Diabetic	Non-Diabetic
Male	17	10
Female	25	32
Total	42	42

Table 3: Cataract Type in Diabetic and Non-Diabetic Subjects

Cataract Type	Diabetic	Non-Diabetic
Senile Type of Cataract	24	20
Posterior Sub Capsular Cataract	03	02
Snowflake Cataract	15	20
Total	42	42

Table 4: Risk Factors Associated with Non-Diabetic Cataract Subjects

Risk Factors	Non-Diabetic Cataract Subjects
Trauma	12
Hypertension	25
Dislipedmia	05
Total	42

DISCUSSION

According to some research, doing cataract surgery on diabetes patients may cause DR to advance rather quickly, trigger vitreous hemorrhage, cause iris neovascularization, and ultimately impair or impair vision. Increased inflammatory cytokines are produced in the eye after uneventful cataract surgery. According to Patel et al., significant increases in vascular endothelial growth factor (VEGF), hepatocyte growth factor, interleukin-1 (IL-1), and pigment epithelium derived factor concentrations occurred 1 day after uneventful phacoemulsification and intraocular lens (IOL) implantation. It took up to 1 month for these increases to return to preoperative levels. These cytokines may cause DR and maculopathy to deteriorate clinically or subclinically.[6]

Both the adjusted (odds ratio=1.668; 95% CI=1.135-2.451, p=0.009) and unadjusted (CI = 1.752-3.465, p 0.001) models were significant (p 0.001), respectively. This is consistent with the findings of the two UK investigations. According to a Brazilian study with a comparable sample size to ours, diabetics with DR have cataract four times more frequently, which is 2.5 times more than what we discovered (1.67 times).

This outcome might be the result of them not maintaining control over the course of their diabetes, which is a significant confounding factor. Since DR is typically a late consequence, the longer duration of DM increases the incidence of cataract in DR patients.[7]

The study showed that diabetic patients mostly have nuclear sclerosis (6.6%), followed by mixed type (26.6%), cortical (15.2%), and posterior cortical/sub capsular type (1.2%). Posterior cortical/sub capsular (32.3%) was more common in non-diabetics, followed by mixed cortex (27.7%), cortical (2.5%), and core (15.3%).Multiple sclerosis causes a variety of problems. This causes early vision loss, mostly in bright light, making driving dangerous2 and increasing the likelihood of corneal complications during phacoemulsification. A central cataract prevents retinal imaging and subsequent laser application. 25 In this study, 33% of photographs were unclassified as cataracts, while 17% were DR.[8]

After cataract surgery, several authors found that diabetic individuals with diabetic retinopathy had increased central macular thickness. After an uncomplicated cataract operation, Kim et al. looked at changes in central point thickness on optical coherence tomography (OCT) in diabetic patients with various retinal conditions and found that 22% of the participants had thickenings of more than 30%. According to Kwon et al., 18% of diabetic patients with diabetic retinopathy experienced thickening of the central subfield of the macula after cataract surgery, which was connected to the severity of retinopathy. The degree of retinopathy and/or the presence of previous diabetic macular edema (DME) affect the likelihood of macular thickening following cataract surgery.[9]

Patients with diabetes are more likely to acquire cataracts (Oimomi et al. 1988; Sensi et al. 1995; Ramalho et al. 1996). Cataract surgery in diabetic patients used to be regarded as high-risk surgery due to the danger of postoperative retinopathy progression and macular edema development, as documented by several researches (Dowler et al. 1995; Pollack et al. 1992; Menchini et al. 1993; Krupsky et al. 1997). After cataract surgery, diabetic patients have also experienced neovascular glaucoma and ongoing retinal growth (Sadiq et al. 1995; Pollack et al. 1991; Schatz et al. 1994). The visual prognosis is linked to these unintended postoperative events. Recent studies have reported fewer postoperative complications and generally more encouraging outcomes, frequently using the phaco emulsification technique (Henricsson).[10]

CONCLUSION

The group with diabetes experienced a greater incidence. Diabetics are more likely to experience

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post-operative problems, which can be treated conservatively. After the lens is removed, the diabetic group still has a moderately higher mistake score than the non-diabetic group, which may be due to a real aspect of retinal or optic nerve malfunction in diabetes. Small incision cataract surgery in diabetics offers favorable and comparable visual outcomes with non-diabetic group Advanced cataracts in diabetics who are presenting for cataract surgery have a generally positive visual outcome, so surgery should not be refused. However, extra care must be taken during the operation, and adequate postoperative monitoring is advised.

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