

ORIGINAL RESEARCH

To determine the outcome of cataract surgery in diabetic and non-diabetic individuals

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ABSTRACT

Aim: To determine the outcome of cataract surgery in diabetic and non-diabetic individuals.

Methods and Materials: 100 diabetic and 100 age-matched non-diabetic people were studied. The current research included all diabetes patients who had cataract surgery. This research comprised diabetic individuals aged 30 to 60 years. Subjects in the non-diabetic group were of similar age and gender who underwent cataract extraction within the same time period. Diabetes was diagnosed based on fasting sugar readings of higher than 120 mg/dl.

Results: The study group consisted of 100 diabetes patients, whereas the control group consisted of 100 non-diabetic individuals. At 10 days, the incidence of post-surgical visual acuity in the diabetes and non-diabetic groups was 0.17 and 0.24, respectively. After three months, the incidence of post-surgical visual acuity in the diabetes and non-diabetic groups was 0.33 and 0.40, respectively. When comparing the means, the findings were non-significant. The difference in post-operative visual acuity between the two research groups at various time intervals. Striate keratopathy was the most prevalent post-surgical complication in both the diabetes and non-diabetic groups (15% vs 9%) respectively. Posterior capsular opacity 13(13%) and 7(7%), and Posterior capsular rent 12% and 9% in diabetic and non-diabetic patients, respectively, were followed by Pigment dispersion 11% and 8% in diabetic and non-diabetic patients.

Conclusion: We conclude that diabetic patients should not be refused for cataract surgeries. However, there is need for taking extra- precautions as diabetic subjects might be more prone for surgical associated complications.

Keywords: Cataract surgery, Diabetic, Non-Diabetic

INTRODUCTION

Cataract is one of the primary causes of blindness worldwide, and it is mostly caused by diabetes. It is one of the most prevalent diabetic eye problems, accounting for up to 20% of all cataract surgeries done on diabetic patients.¹ Diabetic retinopathy is described as progressive retinal vasculopathy induced by persistent hyperglycemia, culminating in structural damage to the neural retina. Micro aneurysms are the first ophthalmoscopically detectable change in diabetic retinopathy and are used to define NPDR.² Cataract in diabetic individuals reduces visual acuity and makes proper evaluation of the retina difficult. As a result, even if there is a risk of exacerbating the retinopathy, it is preferable to conduct

cataract surgery for diagnostic and therapeutic purposes. Cataracts develop at a younger age in diabetics than in non-diabetics and are 2-5 times more prevalent in diabetic individuals. As a result, cataract surgery in diabetics is often performed sooner. Aside from improved vision, diabetic individuals need cataract surgery to diagnose and treat posterior segment disease. Diabetics account for roughly 20% of all cataract surgeries performed in India.³

Poor visual prognosis after cataract surgery in diabetics is linked to the degree of pre-existing retinopathy and diabetic maculopathy before to the procedure. Diabetics have an increased risk of pigment dispersion and fibrinous reactivity in the anterior chamber, as well as the development of posterior synechiae, capsule rupture, and vitreous loss. Postoperative complications in diabetic individuals include neovascular glaucoma, macular edema, severe inflammation, vitreous haemorrhage, synechiae to IOL, retinal detachment, and corneal decompensation. Diabetics are more likely to have postoperative posterior capsule opacification. Current surgical procedures, such as Small Incision Cataract Surgery (SICS) and phacoemulsification, offer an advantage over prior cataract operations in that they allow for faster vision recovery and reduced post-operative inflammation. Modern cataract surgical procedures have improved outcomes.^{4,5} Recent research has shown that diabetic people had improved visual acuity following cataract surgery.⁶⁻⁸ Cataract surgery in diabetic people produces excellent outcomes, with high dependability and a little greater complication rate than in non-diabetic patients. Low postoperative visual acuity is caused by poor preoperative visual acuity, advanced stages of diabetic retinopathy, and old age.⁹

METHODS AND MATERIALS

This research was carried out at the Department of Ophthalmology with clearance from the institute's ethics committee. 100 diabetic and 100 age-matched non-diabetic people were studied. The current research included all diabetes patients who had cataract surgery. This research comprised diabetic individuals aged 30 to 60 years. Subjects in the non-diabetic group were of similar age and gender who underwent cataract extraction within the same time period. Diabetes was diagnosed based on fasting sugar readings of higher than 120 mg/dl. Patients suffering from traumatic cataracts as well as uveitic or complex cataracts were not included in the research.

Extracapsular cataract extraction with posterior chamber intraocular lens implantation was performed in all participants under peribulbar anaesthesia. All individuals' full demographic information, as well as clinical information, were recorded individually. All individuals had their intrasurgical and post-surgical problems, as well as their visual acuity, recorded at 10 days, three months, and six months. The mean Snellen acuity was measured in all individuals.¹⁰

STATISTICAL INVESTIGATION

The collected data was assembled and input into a spreadsheet application before being exported to the data editor page of SPSS version 25.0. The confidence level and level of significance for all tests were set at 95% and 5%, respectively.

RESULTS

The study group consisted of 100 diabetes patients, whereas the control group consisted of 100 non-diabetic individuals. The individuals in the research and control groups were 52.58 and 53.66 years old, respectively. In the diabetic and non-diabetic groups, there were 47 and 53 men, respectively, and 53 and 47 female diabetics and non-diabetics. At 10 days, the incidence of post-surgical visual acuity in the diabetes and non-diabetic groups was 0.17 and 0.24, respectively. After three months, the incidence of post-surgical visual acuity in the diabetes and non-diabetic groups was 0.33 and 0.40, respectively (table 2). When comparing

the means, the findings were non-significant. The difference in post-operative visual acuity between the two research groups at various time intervals (p value > 0.05). Striate keratopathy was the most prevalent post-surgical complication in both the diabetes and non-diabetic groups (15% vs 9%) respectively. Posterior capsular opacity 13(13%) and 7(7%), and Posterior capsular rent 12% and 9% in diabetic and non-diabetic patients, respectively, were followed by Pigment dispersion 11% and 8% in diabetic and non-diabetic patients.

Table 1: Gender wise distribution of study population

Diabetic Patients	Diabetic =100	%	Non Diabetic =100	%
Male	47	47	53	53
Female	53	53	47	47
Age in years				
30-45	22	22	25	25
45-60	55	55	50	50
above 60	100	100	25	25

Table 2: Distribution of cases according to FBS

FBS	Number	%
Normal (70-100)	63	63
High(>100)	37	37

Table 3: Post- surgical visual acuity in subjects of diabetic and control group

Post- surgical period	Diabetic patients	Non-diabetic patients	p - value
10 days	0.17	0.24	>0.05
3 month	0.33	0.40	>0.05
6 months	0.44	0.53	>0.05

Table 4: Complications occurring both study groups

Complications	Diabetic patients (N)	%	Non-diabetic patients (N)	%
Intra- surgical				
Hyphema	3	3	3	3
Vitreous loss	5	5	5	5
Posterior capsular rent	12	12	9	9
Post-operative complications				
Striate keratopathy	15	15	9	9
Pigment dispersion	11	11	8	8
Raised intra-ocular pressure	4	4	2	2
Posterior capsular opacity	13	13	7	7
Wound dehiscence	3	3	0	0
Intra-ocular lens displacement	3	3	0	0

DISCUSSION

Cataract is one of the leading causes of blindness in diabetes people in underdeveloped nations. The specific pathophysiology of diabetic cataract formation, however, remains unknown. Diabetic people receiving cataract surgery are at a greater risk of developing complications. However, the actual frequency of these problems is uncertain.¹¹⁻¹³ As a result of the above information, we designed the current research to analyse and compare the

prognosis of cataract procedures in diabetes and non-diabetic individuals. In this research, 53 (53%) of the diabetics were females, whereas 47 (47%) were men. There were 47 (47%) men and 53 (53%) females among the non-diabetics. Several studies have shown that the prevalence of cataract in females is higher than in men. Senile lens alterations were also more likely in women in the Framingham eye research. Age-related cataract is a bilateral disorder, with one eye afflicted before the other.¹⁴

In the current investigation, we found no significant differences in mean post-surgical visual acuity between the study and control groups (p value >0.05). At 10 days, the incidence of post-surgical visual acuity in the diabetes and non-diabetic groups was 0.17 and 0.24, respectively. At three months, the incidence of post-surgical visual acuity in the diabetes and non-diabetic groups was 0.33 and 0.40, respectively.

In a tertiary institution in Nigeria, Onakpoya OH et al studied the visual result of cataract surgery in diabetics with advanced cataract. Twenty-three diabetic patients and 23 age and gender matched non-diabetic control individuals had extracapsular cataract excision for advanced cataract. Twenty-three diabetic patients and 23 nondiabetic controls were evaluated; the average duration of diabetes was 8.1 ± 7.2 years. At one week, two months, and six months, the mean post-operative visual acuity in diabetics was 0.11 ± 0.38 , 0.33 ± 0.57 , and 0.38 ± 0.49 , compared to 0.23 ± 0.19 , 0.46 ± 0.37 , and 0.48 ± 0.31 in non-diabetics. (p -values of 0.207, 0.403, and 0.465, respectively). Preoperative visual acuity improved in 84.2% of diabetics and 90% of non-diabetics, respectively. Diabetic retinopathy, maculopathy, and diabetes-related surgical complications all contributed to poor visual outcomes. In this research group, visual improvement was reported after surgery for advanced cataract in diabetics. Post-operative surveillance for diabetic retinopathy therapy may improve visual result.¹⁰

Lara-Smallling A et al. reported preoperative risk factors for diabetic individuals having cataract surgery, as well as suitable nursing treatments for these patients. A review of the literature on risk factors and cataract surgery results in diabetes individuals in terms of complications, visual acuity, and visual functionality was conducted. Preoperative risk factors as well as postoperative sequelae like as inflammation and cystoid macular edema (CME) were investigated. To highlight evidence of optimal practises, the role of the nurse as educator and advocate was further investigated in terms of their influence on patient diabetes management to enhance visual outcomes. Diabetic patients over the age of 65 with a history of diabetic retinopathy who are taking insulin and have elevated Hb A1C levels are at an increased risk of intraoperative and postoperative complications, as well as decreased postoperative visual acuity and visual functions, which may impair their quality of life. When designing a perioperative patient education strategy for diabetic patients, high-risk indicators should be recognised to assist lower their risk of cataract problems and enhance their visual results.¹⁵

At the time of admission, fasting blood sugar levels were used to determine glycemic control. Of the 100 diabetic individuals, 37 (37%) had high blood glucose levels (FBS: >100 mg/dl). Their blood sugar levels were stabilised, and they were operated on. At the time of the assessment, 63 (63%) of the patients had normal blood sugar levels (70-100mg/dl). The 100 diabetic patients were all being treated for type 2 diabetes with injectable insulin or oral hypoglycemic medications.

At the end of 4 weeks, the development of PCO in diabetics was 13(13%) compared to 7(7%) in non-diabetics, corroborating earlier studies' findings of an increase in the incidence of PCO in diabetics. Ebihara Y et al.¹⁶ discovered a substantial rise in PCO in diabetes individuals compared to non-diabetic patients in their study.

Pigments over the IOL were found in 3(3%) of diabetes patients compared to 0% in the non-diabetic group. Previous research has indicated that diabetic individuals having cataract

extraction and IOL implantation had enhanced pigment dispersion. Oluwatoyin et al.¹⁰ demonstrated an increase in the quantity of pigment dispersion happening in diabetes patients, i.e. 6 in diabetics and 1 in non-diabetic patients.

Increased post-operative inflammation is connected with longer operation duration. When compared to earlier studies, we discovered no fibrinous exudates or posterior synechiae. According to earlier research, none of the patients in our study exhibited anterior segment neovascularization. Smiddy WE et al. investigated the prevalence of visually significant cataracts after vitrectomy for diabetic retinopathy sequelae. In an institutional environment, they evaluated 40 patients and 56 contemporaneous control patients in a retrospective, sequential, comparative case series. Individuals with diabetes had a lower incidence of cataract extraction following vitrectomy than patients without diabetes, implying a reduced risk of cataract development. This conclusion should be addressed when attributing subnormal vision in a diabetic vitrectomy patient to a cataract. This is particularly relevant since the risk ratio among patients with diabetes in general, as well as patients who have had a prior vitrectomy, is expected to be lower than in the general population.¹⁷

Kim SJ et al. used optical coherence tomography (OCT) to examine the occurrence or development of macular edema (ME) following cataract surgery in diabetic patients, associating this with the degree of diabetic retinopathy or other risk factors. Fifty diabetic eyes that were receiving cataract surgery were studied. According to the findings, diabetic eyes had a higher prevalence of increased centre point thickness on OCT following cataract surgery, which is related with vision loss at 1 month and limited visual recovery at 3 months. Treatment to prevent this might enhance results in comparable patients after surgery.¹⁸

CONCLUSION

We conclude that diabetic patients should not be refused for cataract surgeries. However, there is need for taking extra- precautions as diabetic subjects might be more prone for surgical associated complications.

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