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VISUAL OUTCOME CATARACT SURGERY IN DIABETICS AND NON-DIABETICS PATIENT

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ABSTRACT

A prospective study of comparison of visual outcomes with small incision cataract surgery for intraocular lens implantation in diabetics and non-diabetics group. Total 50 eyes each in the diabetic and non-diabetic group were considered. Patients detailed history like demographic and visual complications were obtained. All patients underwent small incision cataract surgery at Minto Ophthalmic Hospital and Regional Institute of Ophthalmology. The mean age group of the patients in diabetic group was 59.62±6.74 years and control group mean age was 56±7.20 years. Of the diabetics 86% patients were on treatment and 64% patients had good glycaemic control prior to surgery. Mean pre-operative best corrected visual acuity in the diabetic group was 1.31±0.50. Mean post-operative best corrected visual acuity in logMR units in the diabetic group was 0.32±0.4 and in the control group was 0.29±0.5. The difference in pre and post op visual outcome was statistically significant (p=0.01). Post –operative visual acuity of 6/12 or better was achieved in 68 % eyes in diabetics and 78% among non-diabetics. Post- operative complications included: corneal edema, striate keratopathy, anterior chamber reaction, pigment dispersion, cystoid macular edema and posterior capsular opacification. The incidence was significantly higher in the diabetic group. ($p<0.01$). None of the complications were visually disabling and were managed conservatively during the course of follow up. There was no statistically significant difference in the final outcome between the diabetic and non-diabetic group. Small incision cataract surgery in diabetics offers favourable and comparable visual outcomes with non-diabetic group, though incidence of post-operative complications remains high among diabetics.

KEYWORDS: Visual Outcomes, Visual Acuity, Diabetic, Anterior Chamber

INTRODUCTION

Population growth, ageing, urbanization, sedentary lifestyles and an increasing prevalence of obesity are increasing the number of people with diabetes mellitus. Worldwide more than 285 million people are affected by diabetes mellitus. This number is expected to increase to 439 million by 2030 according to the International Diabetes Federation. Globally, cataracts remain the leading cause of blindness, affecting approximately 18 million people. Cataracts occur at an early age and 2-5 times more frequently in patients with diabetes, thus visual loss has a significant impact on the working population. Overall, upto 20% of all cataract procedures are estimated to be performed for diabetic patients[1]. The association between diabetes and cataract formation has been shown in clinical epidemiology and basic research studies. Due to increasing numbers of type 1 and type 2 diabetics worldwide, the incidence of diabetic cataracts steadily rises. Even though cataract surgery, the most common surgical ophthalmic procedure worldwide, is an effective cure, the elucidation of patho-mechnaism to delay or prevent the development of cataract in diabetic patients remains a challenge. Advances in cataract surgery have generally improved the outcomes; however diabetic individuals do not always share the same favourable outcomes. Patients with diabetes mellitus have higher compilation rates from cataract surgery.

Furthermore some studies have reported that cataract surgery may have adverse effects, including, progression of retinopathy, vitreous hemorrhage, iris neovascularization and decrease or loss of vision. Both diabetes and cataract pose an enormous health and economic burden, particularly in developing countries, where diabetes treatment is insufficient and cataract surgery often inaccessible[2]. The present study aims to

Compare the visual outcome with cataract surgery in diabetics and non-diabetics patients.

MATERIALS AND METHODOLOGY

This is a prospective study conducted between November 2011 – May 2013 at Minto Ophthalmic Hospital, Regional Institute of Ophthalmology, attached to Bangalore Medical College and Research Centre. During this period, 50 diabetics and 50 non-diabetics who underwent small incision cataract surgery with intraocular lens implantation were prospectively examined. The patients had good glycaemic control prior to surgery, without any diabetic retinopathy on fundus examination and all had a minimum follow up of 1 month. 50 cases (diabetics) and 50 controls (non-diabetics) fulfilling the selection criteria were included into the study and informed written consent was taken.

Inclusion Criteria

- Patients who have given informed consent.
- Patients with type 2 diabetes mellitus.
- Age group 18-65 years.

Exclusion Criteria

- Patients with traumatic or complicated cataract.
- Neovascularisation of iris.
- Secondary glaucoma
- Iridocyclitis
- Uncontrolled diabetes
- Posterior segment causes of visual loss in diabetics

Pre-Operative Evaluation

All patients were admitted to the hospital one day prior to surgery. All these patients underwent pre-operative evaluation and complete ophthalmic examination, including a thorough history with required demographic data. Systemic evaluation was also carried out.

Ophthalmic examination included:

Visual acuity was recorded using Snellens E chart and Jaegers near vision chart.

Slit lamp Examination

Applanation tonometry using GoldmannApplanation Tonometer.

Gonioscopy using Goldmann three-mirror goniolens.

Keratometry using Bausch and Lomb Keratometer.

Axial length measurement using A-Scan.

IOL power calculation using SRK formula (A constant 118.2)

Posterior segment evaluation by Indirect Ophthalmoscope.

Ultrasound scans of the posterior segment (B-scan).

Pre-Operative Preparation

The day before surgery and hours before surgery one drop of ciprofloxacin eye drops was instilled in the inferior fornix at hourly intervals. Pre op pupillary dilation was obtained using Tropicamide and phenylephrine 2.5% eye drops instilled thrice an hour prior to surgery.

Procedure

Anesthesia and akinesia of the globe was achieved with peribulbar block of 4 ml mixture of 2% xylocaine with adrenaline, with addition of hyaluronidase (1500 IU) with 2 ml of 0.75% bupivacaine. Before staring the procedure, the eye to be operated was painted with 5% povidone iodine and the same was instilled in the cul-de-sac for 5 mins.

SURGERY

All patients underwent small incision cataract surgery with posterior chamber intraocular lens implantation under peribulbar anaesthesia.

Manual Small Incision Cataract Technique

Under aseptic precautions eye was draped, a wire speculum was placed and superior rectus bridle suture was passed and clamped on to the towel. A fornix based conjunctival flap for superior tunnel was made. Superficial scleral vessels were cauterized. A 6mm/6.5mm length straight or frown incision was made on the scleral 1.5 to 2mm away from the limbus. Sclerocorneal tunnel was constructed. A side port entry was made with paracentesis knife. Anterior chamber filled with viscoelastic substance through the side port. A CCC or can opener capsulotomy was performed. With penetrating angled keratome anterior chamber was entered at the anterior limit of the tunnel and extended to the periphery using blunt tipped keratome. Hydrodissection was performed in cases where CCC was done. Nucleus prolapsed into the anterior chamber and delivered out using either sandwich technique or viscoexpression. Cortical matter aspired with simcoe cannula, a 6 to 6.5mm PMMA IOL was implanted in the bag in CCC cases, in the ciliary sulcus for can opener cases. Anterior chamber was formed with ringer lactate, side port opening was sealed by stormal hydration. Subconjunctival 0.2ml (40mg/ml) Gentamycin and 0.3ml (4mg/ml) Dexamethasone, total 0.5CC was given at end of procedure. Pressure pad was applied at end of surgery.

Post-Operative Evaluation

On the first post-operative day, all the patients were submitted to detailed slit lamp examination and fundus examination. Visual acuity was recorded. The patients were discharged on the second or third post-operative day. On discharge all patients were put on corticosteroid +antibiotic combination eye drops 6-8 times per day, which was then tapered over a period of 6weeks. The patients were asked to review at 1 week, 4 weeks and 3 months from the date of

surgery. Visual acuity was recorded on every visit. At all subsequent visits, patients were subjected to the following examinations; Slit lamp examination, Fundus examination, Visual acuity recording.

Assessment of Anterior Chamber Inflammation

Aqueous flare and cells measured by counting within the field visible with a slit lamp keeping the beam at maximum intensity. Describe by The SUN Working Group Grading Scheme for Anterior Chamber Cells & Flare.

Table 1: Different Grades

Grade	Cells in Field (high Intensity, 1x1 mm Slit Beam)	Anterior Chamber Flare
0	<1	None
0.5	1-5	
1+	6-15	Faint, barely detectable
2+	16-25	Moderate (Iris and lens details clear)
3+	26-50	Marked (Iris and lens details hazy)
4+	>50	Intense (Fibrinoid reaction)

Assessment of PCO

Pupils were dilated and slit lamp bio-microscopy using retro-illumination was performed giving special attention to posterior capsule under the IOL optic. PCO grading was done as done by Kucuksumer Y et al., by subjective assessment of the extent and density (assessed by its adverse effect on BCVA) of the lens epithelial cell. (LEC) migration on the posterior capsule as follows.

Grade-0: Posterior Capsule completely clear and no LEC migration.

Grade-I: LEC migration at the periphery with a clear visual axis.

Grade-II: LEC migration onto the visual axis with no drop in BCVA.

Grade-III: LEC migration onto the visual axis with BCVA better than 6/12.

Grade-IV: LEC migration onto visual axis and a BCVA of 6/12 or worse.

RESULTS

The study group consists of 50 eyes of diabetics and 50 eyes of non-diabetics that underwent small incision cataract surgery with intraocular lens implantation. The age and sex wise distribution, glycaemic control, preoperative visual acuity, coexistent morbidities, complications of the procedure and final visual outcome were analyzed.

Table 1: Age Distribution of the Patients

Age Group (Years)	Diabitics	Non Diabitics
18-29	0	0
30-39	2	1
40-49	6	10
50-59	16	17
60-65	26	22
total	50	50

In this study, highest number of patients were in the age group of 60-65 years that is 26 (52%) in diabetics & 22 (44%) in control group. In this study patients above 65 years of age were excluded. Remaining 24 (48%) of the patients in

diabetics and 28 (56%) of the patients in control were below 60 years.The mean age group of the patients in diabetic group was 59.62 ±6.74 yrs and 56±7.20 yrs in control group.

Table 2: Gender Distribution

Gender	Diabitics	Non Diabitics	Total
Males	33	28	61
Females	17	22	39

In this study, in diabetic 17 (34%) were females and 33 (66%) were males. Among the controls, 28 (56%) were males & 22 (44%) were females.

Table 3: Duration of Diabities in Cases

Duration of Diabeties (In Years)	No. of. Patients	Percentage
<1 yr	13	26%
1- 3 yrs	18	36%
4- 6 yrs	6	12%
7- 9 yrs	5	10%
10- 12 yrs	5	10%
13- 15 yrs	3	6%
16 yrs and more	0	0%
Total	**50**	**26%**

Majority of patients 31 (62%) were recently diagnosed diabetics with duration of disease being less than 3 years. There were about 8 (16%) patients with duration of diabetes being more than 10 years.

Table 4: Pre Operative Glycaemic Control

Fasting Blood Sugar (Mg/Dl)	No. of. Patients	Percentage
Low (<70)	2	4%
Normal (70 – 110)	32	64%
High (>110)	16	32%
Total	**50**	**100%**

Of the fifty patients in the diabetic group, majority of patients 32 (64%) had good glycaemic control (FBS: 70 – 110 mg/dl). Two (4%) patients had low blood sugar levels at the time of examination (<70 mg/dl). Their blood sugars normalized eventually and they were operated. More importantly, 16 (32%) patients had high fasting blood sugar levels (FBS> 110mg/dl). The highest fasting blood glucose value recorded was 143 mg/dl. This included patients with and without treatment.

Table 5: Patients on Treatment

	No. of. Patients	Percentage
On medication	43	86%
Not on medication	7	14%
Total	**50**	**100%**

In the present study, 43 (87%) of the patients were on treatment for type 2 diabetes mellitus with either injection insulin or oral hypo-glycaemic agents while the remainder 7 (14%) were not on any medication for the same.

Table 6: Co-Existing Ocular Diseases

Ocular Disease	Diabetics	% Age	Non Diabetics	%Age
Psuedoexfoliation	5	10%	6	12%
Myopia	3	6%	3	6%
Total	**8**	**16%**	**9**	**18%**

The two main co-existing pathologies were psuedoexfoliation and myopia. There were 5 (10%) patients in diabetic group and 6 (12%) patients in the non-diabetic group that had psuedoexfoliation. Among the myopes, there were 3 cases each (6%) in both the groups.

Table 7: Co-Existing Systemic Morbidities

Systemic Morbidities	Diabetics	% Age	Non Diabetics	% Age
Hypertension	12	24%	10	20%
Ischaemic heart disease	2	4%	4	8%
Bronchial asthma	3	6%	2	4%
Total	**17**	**34%**	**16**	**32%**

Systemic hypertension though the most frequent co-morbid disease in both the groups, was more frequent amongst diabetics as seen in this study, that is 12 (24%) compared with 10 (20%) of the non-diabetic counter parts. The other systemic c-morbidities in our study were ischaemic heart disease in 2 (4%) of cases in diabetics and 4(8%) cases in the non-diabetic group. The difference was not statistically significant. 3 (6%) patients in the diabetic group and 2 (4%) patients in the non-diabetic group had bronchial asthma.

Table 8: Pre Operative Bcva

Visual Acuity	Diabetics	% Age	Non Diabetics	% Age
<2/60	8	16%	6	12%
3/60 – 4/60	26	52%	22	44%
5/60 – 6/60	14	28%	16	32%
6/36 – 6/24	2	4%	6	12%
Total	**50**	**100%**	**50**	**100%**

Twenty-six eyes (52%) of the diabetics and 22 eyes (44%) of the control patients had vision between counting fingers 3 to 4 meters (3/60 to 4/60). Majority patients 48 (96%) of the diabetics and 44 (88%) of the non-diabetics had visual acuity less than 6/60. Only 2 (4%) of the diabetics and 6 (12%) of the control had vision of 6/36 – 6/24 (measured by Snellen visual acuity chart). The mean best corrected pre-operative visual acuity in both the groups was calculated in log MAR units. The mean preoperative best corrected visual acuity in the diabetic group was 1.31 ±0.45 and that in the control (non-diabetic) group was 1.35±0.50. The p value (<0.10) was not statistically significant.

Table 9: Final Visual Outcome

Visual Acuity	Diabetics	% Age	Non Diabetics	%Age
<6/60	3	6%	2	4%
6/60 – 6/36	5	10%	3	6%
6/24 – 6/18	8	16%	6	12%
≥6/12	34	68%	39	78%
Total	**50**	**100%**	**50**	**100%**

The final visual outcome was recorded using Snellens visual acuity chart and the values were converted to logMAR units for statistical analysis. Majority of the patients, 34 (68%) in the diabetic group and 3 (78%) in the non-diabetic group had visual acuity of 6/12 or better at the end of 6 weeks of follow up. Only 3 patients in the diabetic group and 2 patients in the non-diabetic group had visual acuity less than 6/60. The mean post-operative best corrected visual acuity in logMAR units in the diabetic group was 0.32± 0.4 and in the control group was 0.29±0.5. On comparing the post op values in both the groups the p value was (<0.2) which was not statistically significant. On comparing the pre-operative and post-operative visual acuity in both the groups the p value (0.01) was statistically significant.

Table 10: Post Operative Complications

Complications	Diabetics	Non Diabetics
Corneal edema	16	9
Striate keratopathy	7	3
Pigment dispersion	4	4
Anterior chamber reaction	18	9
Cystoid macular edema	7	3
Posterior capsule opacification	3	1
Total	**55**	**29**

Corneal edema was found in 16 (32%) and 9 (18%) of the cases in diabetic and non-diabetic groups respectively which was considerably higher in diabetics compared to non-diabetics. Striate keratopathy was found in 7 (14%) of the diabetics compared to 3 (9%) in non-diabetics.

Pigments over IOL were seen in 4 (8%) of the cases in diabetics as compared to 4 (8%) in the control group. It was similar in both the groups in our study. In this study, total 18 (32%) eyes in the diabetic group and 9 (18%) eye in the no-diabetic group had anterior chamber reaction.

Cystoid macular edema was noted in 7 (14%) of diabetic and 3 (6%) of non-diabetic eyes post operatively. In this study the development of PCO in diabetics was 3 eyes (6%) compared to 1 eye (2%) in non-diabetics, at the end of 6 weeks.

DISCUSSIONS

The study includes cases consisting of 50 diabetic & 50 non diabetic patients (control), who underwent cataract surgery at Minto Ophthalmic Hospital and Regional Institute of Ophthalmology, Bangalore Medical College and Research Institute, Bangalore from November 2011 to May 2013. They were compared for their visual outcome.In this study, highest number of patients were in the age group of 60-65 years that is 26 (52%) in diabetics & 22 (44%) in control group. In this study patients above 65years of age were excluded. Remaining 24 (48%) of the patients in diabetics and 28 (56%) of the patients in diabetics and 28 (56%) of the patients in control group were below 60 years.The mean age group of the patinets in diabetic group was 59.62 ±6.74 yrs and 56 ±7.20 yrs in control group.The Framingham and other eye studies indicate a 3-4 fold increased prevalence of cataract in patients with diabetes under 65 and upto a twofold excess prevalence in patients above 65[3,4]. Similarly in this study in diabetic group more than 50% of the patients are below 65 years, showing increased prevalence of cataract in younger age group. In this study, in diabetic group 17 (34%) were females and 33 (66%) were males. Among the controls, 28 (56%) were males & 22(44%) were females.Various studies have proven the prevalence of cataract itself is more common in females than males. In the Framingham eye study also senile lens changes were more common in women. But in our study majority of patients were males.Age related cataract is a bilateral

condition, one eye affected earlier than the other. There is no predilection for either eye, and in our study also there was no specific predilection noticed. In these 50 patients in the diabetic group, we assessed the pre-operative glycaemic control. Patients with extremely high blood sugars and uncontrolled diabetes were excluded from the study. Glycaemic control was assessed using fasting blood sugar levels at the time of admission. Of the fifty patients in the diabetic group, majority of patients 32 (64%) had good glycaemic control (FBS: 70 – 110mg/dl). Two (4%) patients had low blood sugar levels at the time of examination (<70 mg/dl). They were not clinically symptomatic and did not require any treatment. Their blood sugars normalized eventually and they were operated. More importantly, 16 (32%) patients had high fasting blood sugar levels (FBS> 110 mg/dl). The highest fasting blood glucose value recorded was 143 mg/dl. This included patients with and without treatment.In the present study, 43 (87%) of the patients were on treatment for type 2 diabetes mellitus with either injection insulin or oral hypo-glycaemic agents while the remainder 7 (14%) were not on any medication for the same. This was due to mainly three reasons, patients were recently diagnosed were on lifestyle modification or had discontinued treatment on their own. This poor control of blood sugar level is associated with increased risk of retinopathy progression, inflammation and infections. Throughout the study it was seen that patients maintain an adequate blood sugar level by giving them insulin therapy whenever necessary.

We also looked at the duration of disease among our diabetic group. Majority of patients 31(62%) were recently diagnosed diabetics with duration of diseases being less than 3 years. There were about 8 (16%) patients with duration of diabetes being more than 10 years. The risk for cataract formation and diabetic retinopathy is increased in patients with longer duration of diabetes and in those with poor metabolic control. The prevalence of cataract was higher in those with a longer duration of diabetes and known diabetes, suggesting a more prolonged influence of biochemical cataractogenic stimuli (hyperglycemia). However, the pathways by which hyper-glycemia leads to cataract are still unknown but they probably involve a modification of the lens proteins leading to AGE formation or modification of the ATPase pumps, leading to osmotic stress, or both. Systemic hypertension though the most frequent co-morbid disease in both the groups, was more frequent amongst diabetics as seen in this study, that is 12 (24%) compared with 10 (20%) of the non-diabetic counter parts.A similar high incidence was seen in study by Onakpoya H Oluwatoyin et al[118], in which hypertension was seen in 60.9% compared with 26.1% in non-diabetic group.In other studies by Squirrel et al[77], in which 55% had hypertension, Mittra et al, in which 68% had hypertension. By this it can be said that hypertension is a usually accompanying disease long with diabetes mellitus. The other systemic co-morbidities in our study were ischaemic heart disease in 2 (4%) of cases in diabetics and 4 (8%) cases in the non-diabetic group. The difference was not statistically significant. 3 (6%) patients in the diabetic group and 2 (4%) patients in the non-diabetic group had bronchial asthma. The groups were comparable in this aspect also.We also looked at co-existing pathologies were psuedoexfoliation and myopia. There was 5 (10%) patients in diabetic group and 6 (12%) patients in the non-diabetic group that had psuedoexfoliation.A study was done by Psilaset al[116] on psuedoexfoliation syndrome (PXF) was determined prospectively in 2 outpatient cohorts: a normal control group and a diabetic group with or without evidence of diabetic retinopathy. Four hundred and eighty-nine (489) normal patients over the age of 50 years (group A) were compared with 325 diabetic patients of comparable age (group B). Within the diabetic cohort 121 patients did not exhibit signs of diabetic retinopathy, whereas the rest were suffering from either background diabetic retinopathy (143), or proliferative diabetic retinopathy (61). Psuedoexfoliation syndrome was present in 23.7% of patients group A and 11% of patient in group B. Within the latter group, PXF was significantly less prevalent in the subgroup consisting of patients with proliferative diabetic retinopathy (3.2%). Correlating well to the age, PXF was significantly less prevalent for the age group 60-70 and greater

than 70 for these patients. These results indicate that PXF occurs less frequently in diabetics with background diabetic retinopathy and even less so in the presence of proliferative diabetic retinopathy.Masoud et al[117], did a study on psuedoexfoliation syndrome in diabetic patients and their were as follows: Four hundred diabetic patients aged 50 years or above were recruited for the study. Of whom 24 patients were found to have psuedoexfoliation with an overall prevalence of 6%.Longer duration of surgery is associated with increased post-operative inflammation. Fibrinous exudates& posterior synaechiae was not found in our study compared to previous study. None of the patients in our study had anterior segment neovascularization, as reported in previous studies.Cystoid macular edema was noted in 7(14%) of diabetic and 3 (6%) of non-diabetic eyes post operatively. Factors that influence the amount of postoperative inflammation and the incidence of clinical and angiographic cystoid macular edema are duration of surgery, wound size and posterior capsular rupture or vitreous loss. Liu et al. showed that phacoemulsification surgery affects the blood-aqueous barrier more severely in diabetic patients with proliferative diabetic retinopathy than in patients with non-proliferative diabetic retinopathy or non-diabetic patients. An analysis of Medicare beneficiaries from the years 1997 through 2001 revealed that the rate of cystoid macular edema diagnosis after cataract surgery was statistically significant higher in diabetic patients than in non-diabetics.In this study the development of PCO in diabetics was 3 eyes (6%) compared to 1 eye (2%) in non-diabetics, at the end of 6 weeks, confirming the finding of increase in incidence of PCO in diabetics as shown in previous studies. Study by Ebihara Y et al[86], also showed significant increases in PCO in diabetic compared to non-diabetic patients. A study by Hyashi K et al[85], also showed significant increase in PCO in diabetics after cataract extraction compared to non-diabetics. The LEC's proliferate in response to many factors; one of these triggers is inflammation. It has been suggested that surgical invasion and suggested that surgical invasion and contact with the IOL stimulate residual LECs to produce cytokines such as interleukin-1 (IL-1), IL-6, IL-8, basic fibroblast growth factors and transforming growth factor-β. The cytokines may in turn affect epithelial cells as autocrine or paracrine factors and induce collagen production and fibrous proliferation. Thus, the degree of postoperative inflammation may be related to the development of PCO.Diabetic patients have significantly more extensive PCO after cataract surgery than non-diabetic patients. Opacification of the posterior capsule undoubtedly interferes with postoperative fundoscopy of the retina, retinal photocoagulation, and even vitreous surgery, which is necessary in some cases. Therefore, it is important to maintain transparency of the entire posterior capsule in patients with diabetes.The final visual outcome was recorded using Snellens visual acuity chart and the values were converted to logMAR units for statistical analysis. Majority of the patients, 34 (68%) in the diabetic group and 39 (78%) in the non-diabetic group had visual acuity of 6/12 or better at the end of 6 weeks of follow up. Only 3 patients in the diabetic group and 2 patients in the non-diabetic group had visual acuity less than 6/60. This was post-operative best corrected visual acuity in logMAR units in the diabetic group was 0.32±0.4 and in the control group was 0.29±0.5. On comparing the post op values in both the groups the p value was (<0.2) which was not statistically significant. On comparing the pre-operative and post-operative visual acuity in both the groups the p value (0.01) was statistically significant indicating that both the groups had good visual outcomes following surgery. This meant that cataract surgery in diabetic patients without retinopathy led to favourable and comparable visual outcomes to that of non-diabetics. Data from the Fragmentation and other eye studies indicate a three to fourfold increased prevalence of cataract in patients with diabetes under the age of 65, and up to a twofold excess prevalence in patient above 65[3,4]. The risk is increased in patients with longer duration of diabetes and in those with poor metabolic control. A special type of cataract—known as snowflake cataract—is seen predominantly in young type 1 diabetic patients and tends to progress rapidly. Cataracts may be reversible in young diabetics with improvement in metabolic control. The most frequently seen

type of cataract in diabetics is the age-related of senile variety, which tends to occur earlier and progresses more rapidly than in non – diabetics.The Wisconsin Epidemiologic Study of Diabetic Retinopathy investigated the incidence of cataract extraction in people with diabetes. Furthermore, additional factors associated with higher risk of cataract surgery were determined. The 10-year cumulative incidence of cataract surgery was 8.3% in patients suffering from type 1diabetes and 24.9% in those from type 2 diabetes. Predictors of cataract surgery included age, severity of diabetic retinopathy and proteinuria in type 1 diabetic whereas age and use of insulin were associated with increased risk in type 2 diabetics[5]. A follow-up examination of the Beaver Dam Eye Study cohort, consisting of 3684 participants 43 years of age and older, performed 5 years after the baseline evaluation showed an association between diabetes mellitus and cataract formation[6]. In the study, the incidence and progression of cortical and posterior subcapsular cataract was associated with diabetes. In addition, increased levels of glycated hemoglobin were shown to be associated with an increased risk of nuclear and cortical cataracts. In a further analysis of the Beaver Dam Eye study the provenance of cataract development was studied in a population of 4926 adults[7]. Diabetic patients were more likely to develop cortical lens opacities and showed a higher rate of previous cataract surgery than non – diabetics. The analysis of the data proved that longer duration of diabetes was associated with an increased frequency of cortical cataract as well as an increased frequency of cataract surgery.The aim of the population-based cross-sectional Blue Mountains Eye Study was to examine the relationship between nuclear, cortical, and posterior subcapsular cataract in 3654 participants between the years 1992 to 1994 [8.] The study supported the previous findings of the harmful effects of diabetes on the lens. Posterior subscapsular cataract was shown to be statistically significantly associated with diabetes. However, in contrast to the Beaver Dam Eye Study, nuclear cataract showed a weak, not statistically significant, association after adjusting for other known cataract risk factors.A population-based cohort study of 2335 people older than 49 years of age conducted in the Blue Mountains region of Australia investigated associations between diabetes and the 5-year incidence of cataract. The results of this longitudinal study conducted by the same group of investigators as the Blue Mountains Eye Study demonstrated a twofold higher 5-years incidence of cortical cataract in participants with impaired fasting glucose. Statistically significant associations were shown between incident posterior subcapsular cataract and the number of newly diagnosed diabetic patients[9]. The Visual Impairment Project evaluated risk factors for the development of cataracts in Australians. The study showed that diabetes mellitus was an independent risk factor for posterior subcapsular cataract when present for more than 5 years[10]. A goal of the Barbados Eye study was to evaluate the relationship between diabetes and lens opacities among 4314 black participants[11]. The authors found that diabetes history (18% prevalence) was related to all lens changes, especially at younger ages

CONCLUSIONS

Present study concludes that, the small incision cataract surgery in diabetics without diabetic retinopathy can yields similar visual outcomes. Higher incidence of post-operative complications among diabetics, which can be conservatively managed.

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