

**Original Research Article****Incidence of Development and Progression of Diabetic Retinopathy after Cataract Surgery in Patients, Attending in Tertiary Care Hospital, at A.N.M.M.C.H, Gaya**

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Abstract

Objective: Present Study was conducted to assess the development and progression of Diabetic Retinopathy after cataract surgery.

Materials and Method: A total of 68 patients more than 60 years of age, one eye of each undergone cataract surgery were included in the study. The Wisconsin scale was used for the grading of retinopathy. Preoperative and 1-month postoperative (baseline) were compared side by side with 12-months postoperative fundus examination.

Result: Out of 68 patients 45 eyes (66.18%) there was no change in the retinal status postoperatively, in 23 eyes (33.82%) there was postoperative progression of diabetic retinopathy compared with the fellow non-operative eye, in which progression occurred in 7 eyes (30.43%) The severity of preoperative status affected the incidence of progression.

Conclusion: Diabetic patients undergoing cataract surgery appear to have an increase in DR progression rates 12 months after surgery.

Keywords: Cataract, Diabetes mellitus, Diabetic retinopathy, Progression, Surgery.

Introduction

Diabetes has become the epidemic of the 21st century and diabetic retinopathy will in the coming year's accounts for an increasing proportion of the workload of Ophthalmologist.

Diabetes is the one of the most common risk factor for cataract development in the underdeveloped countries. Furthermore, diabetic patients suffer lens opacities at an earlier age than

individual without diabetes. Wisconsin Epidemiological Study of Diabetic Retinopathy reported that cataract was the principal cause of legal blindness in adult onset diabetes and the second most common cause of legal blindness after proliferative diabetic retinopathy in those with juvenile onset diabetes.

The effect of cataract surgery on the postoperative course of diabetic retinopathy in unclear. Jaffe and

Burton reported the development of a severe exudative form of diabetic macular edema following cataract extraction. Various other studies have also described the pattern of deterioration of diabetic retinopathy after contact surgery. In contrast, Sebastian found that cataract surgery was not associated with the progression of diabetic retinopathy, as in his series of patients similar progression was observed also in the unreported fellow eye.

The purpose of this retrospective study was to examine the relationship between cataract surgery and postoperative course of diabetic retinopathy, and to correlate any progression of retinopathy to the degree of glycemic control, duration of diabetes and mode of treatment.

Material and Methods

Present study was conducted in the Department of Ophthalmology, A.N.M. Medical College, Gaya, during the period of January 2013 to December 2013. A total of 68 Patients aged more than 60 years or older undergoing cataract surgery (Either Manual Small Incision or Phacoemulsification) and aiming to assess the surgical outcomes and progression of diabetic retinopathy were Included in the study. The inclusion criteria are Diabetes mellitus diagnosed at least 6 months prior to cataract surgery, Uneventful Surgical Procedure with no vitreous humor rupture of posterior capsule, no laser treatment for established diabetic retinopathy applied either before surgery or within one month after surgery, No other ocular disorders, and A postoperative follow up period of at least one year, A fundal examination prior to surgery which served as a baseline examination for further comparison of the postoperative retinal course, Additional fundus, Examination during each of the three distinct periods within the first year of follow-up, the first of these follow-up periods, first was from the beginning of the second week to the end of the 3rd month, The second was between 4 and 6 months after surgery, and the third, was between 7 and the 12 month.

For each participant, a full medical and ocular history was taken before cataract surgery. This included duration of diabetes mellitus, presence of other systemic diseases and medication. A complete ocular examination was also recorded initially as well as during each follow-up. This included determination of best corrected visual acuity, tonometry, slit lamp examination and retinal biomicroscopy, goldmann three-mirror examination and indirect ophthalmoscopy. Also recorded were the findings of pre and postoperative fluorescing angiography, and fundus photographs.

On the basis of the ocular findings 2 subgroups were identified, The first, Defined as the "no change" Subgroup considered of eyes in which the retinal status remained unchanged following surgery regardless of whether diabetic retinopathy was present preoperatively. The second termed the Progression subgroup, considered of eyes in which diabetic retinopathy progressed following surgery.

Progression was considered to have occurred when (1) After surgery a patients with pre-existing non-proliferative diabetic retinopathy(NPDR) Showed postoperative aggravation of the non-proliferative changes with or without the occurrence or aggravation of cystoid macular fundus (CME) or showed development of proliferative diabetic retinopathy (PDR) or (2) A patient with PDR showed postoperative aggravation of proliferative changes in the posterior pole with or without the occurrence of CME, The postoperative occurrence of CME alone without other evidence of aggravation of diabetic retinopathy was not regarded as progression of retinopathy since CME is a known complication after cataract surgery even in the absence of diabetic retinopathy.

Results

All 68 patients with diabetes underwent cataract surgery at the time of recruitment to the study, including 35 men and 33 women with a mean age of 63 years. The mean duration since diagnosis of

diabetes was 19-25 years (ranging from 1 to 30 years).

Following cataract Surgery, Out of 68 patient's 45 eyes (66.18%) showed no change in the status of retinopathy and 23 eyes (33.82%) showed progression of diabetic retinopathy. In no change group, although none showed post operative aggravation of diabetic retinopathy, CME development was seen in 7 eyes, 5 of them with NPDR and 2 with PDR.

In the "progression group" only 1 eye with preoperative NPDR developed PDR after surgery

and this progression was accompanied with CME. Following Cataract surgery 6 eyes with PDR, developed progression of neo-vascularisation. Of these eyes 2 developed vitreous hemorrhages, 1 developed rubeosis iridis and 2 developed both rubeosis iridis and vitreous hemorrhage. In the group of 23 eyes that showed progression of retinopathy 12 eyes, 7 with NPDR and 5 with PDR preoperatively developed CME as well. This total of 22 eyes which initially did not have CME developed it after cataract surgery.

Table shows Visual Acuity Results at the end of 1 year of postoperative follow up

VISUAL ACUITY	NO CHANGE GROUP (n=45, 66.18%)		PROGRESSION GROUP (n=23, 33.82%)		TOTAL(n=68)
	Without CME N=28	With CME N=17	Without CME N=3	With CME N=20	
>6/12	15	2	-	6	23(33.82%)
6/12-6/36	-	8	-	4	12(17.64%)
<6/36	17	6	4	6	33(48.52%)

Discussion

Postoperative progression of diabetic retinopathy occurred in 33.82% of the eyes in this study. It is slightly higher than that amount the fellow non-operated eyes .Further more when we examined the state of retinopathy in non operated eyes in relation to the post operative course in the fellow operated eyes we found that where the operated eye showed no change in retinal status the non-operated eye tended also to remain unchanged while if the operated eye showed progression there was a tendency to progression in the non-operated eye as well.

The overall incidence of postoperative progression of diabetic retinopathy was 33.82%. However, the rate varied according to preoperative severity of retinopathy, in eyes with preoperative NPDR and in eyes with preoperative PDR. This is in line with previous observation that the postoperative prognosis of diabetic retinopathy depends on its preoperative severity. Deterioration usually took the form of aggravation of a pre-existing state, either of NPDR or of PDR and only one eye showed progression from NPDR to PDR, In eyes with NPDR, development of progression is

evident usually within 3 months of cataract surgery however, aggravation of retinopathy tended to appear more than 3 months after surgery in eyes with preoperative PDR.

Ruiz and Saatci also found progression of diabetic retinopathy after extra capsular cataract extraction and posterior chamber lens implantation in eyes with Laser-ablated retina.

Cystoid Macular Edema (CME) often occurred after cataract surgery and new cases of CME were seen in 23 eyes (33.82%), however, its incidence varied with postoperative retinal course. It developed even in 37.77% (17/45) of eyes without postoperative aggravation of retinopathy and as many as (86.95% (20/23) of eyes with postoperative retinopathy progression. Cheng and Franklin also found that CME occurs more commonly in eyes with diabetic retinopathy than without it, where as Ruiz et al found only on 8% incidence of CME development following extra capsular cataract extraction.

In our study, progression of retinopathy seen in 23 eyes out of which, 5 showed aggravation of PDR. Out of these 5 eyes, 3 developed PDR associated complications including rubeosis iridis and

vitreous hemorrhage. None of the eyes progressed to neovascular glaucoma. Interestingly all of the eyes with complications of PDR had already developed them prior to surgery.

In all cases the complications regressed after laser ablation during the year of follow-up.

Visual acuity of at least 6/12 was achieved in 33.82% in our series and between 6/12 and 6/36 in 17.64%. Improvement in vision may be a more relevant criterion of success than the final visual acuity in cases of severe diabetic retinopathy, especially in those with diabetic maculopathy.

Majority of eyes showed improvement in vision postoperatively even though many of these eyes had advanced diabetic retinopathy and CME occurred commonly.

The blood-aqueous barrier has been found to be impaired more severely in patients with PDR than in patients with NPDR as indicated by substantially higher levels of aqueous flare after surgery in eyes with proliferative diabetic retinopathy. Limitation in our study is the assessment of DR in non operated eyes may have been hampered by lens opacity, so that we may have missed recognizing mild DR Lesions in non operated eyes. However, eyes that remain unoperated for 12 months would have been unlikely to have advanced cataract. Eyes that underwent cataract surgery may already be at greater risk of DR progression than non surgical fellow eye, regardless of their surgical status A longitudinal observational study is a feasible design with evidence quality close to that from randomized controlled trials, and paired-eye comparison of the same patient is the most comparable analysis that we can conduct.

Conclusion

We found that cataract surgery may exacerbate the development and Progression of Diabetic retinopathy in older patients with diabetes, compared with fellow eyes of the same patient that had not undergone cataract surgery during a 12 month period. It is important for clinicians to

recognize this risk and to take appropriate precautions like closer monitoring or preoperative Laser for at risk eyes.

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