

Cataract Surgery and Postoperative Complications in Diabetic Patients

Dorotea Ivančić¹, Zdravko Mandić², Josip Barać¹ and Mirta Kopic¹

¹ Department of Ophthalmology, Clinical Hospital Osijek, Osijek, Croatia

² University Department of Ophthalmology, Clinical Hospital »Sisters of Mercy«, Zagreb, Croatia

ABSTRACT

Diabetes mellitus influences the function and morphology of the eye lens. The cataract is the second most common complication of diabetes mellitus on the eye. A hundred patients with cataract were examined in the prospective study. The patients were divided into two groups. The first group consisted of 50 patients with cataract who had not suffered from a system or local disease. The second group consisted of 50 patients with cataract and diabetes mellitus that had lasted for at least five years. In both groups the patients underwent identical cataract extra capsular extraction with intraocular PMMA (polymethylmethacrylate) lens implantation in camera posterior. The objective of this study was to compare the two groups of patients in order to find out the most common intraoperative or postoperative complications in diabetics. The most common postoperative complications in patients suffering from diabetes were inflammatory reactions and bleeding: postoperative keratopathy, uveitis anterior serous and uveitis anterior fibrinous with posterior synechia and opacity of the posterior lens capsule as results. Postoperative visual acuity was worse in the patients in group II on the seventh day and six months after operation. It was diabetic retinopathy and its progression that caused deterioration of visual acuity. Diabetic retinopathy and its progression, as well as maculopathy were found only in patients who were not treated with photocoagulation before the operation.

Key words: cataract surgery, diabetic cataract, diabetes mellitus

Introduction

Diabetes is disease of our civilisation. In developed countries 2–4% of the population suffers from diabetes. Diabetes is also the most common disease among system diseases that cause blindness. Every fourth or fifth patient suffering from diabetes has also complications on the eye. The first and the most common one is diabetic retinopathy and the second one is diabetic cataract, which can appear at any age. However, it is more common in older patients. Possibility for visual acuity improvement is the most important indication for surgical treatment of cataract. Other indications for operation of cataract in diabetics is poor visibility of retina because of cataract during vitrectomy or if cataract obstructs laser-photocoagulation treatment.

Two groups of patients with cataract have been enrolled in the prospective study. In both groups the patients underwent identical cataract extra capsular extraction with intraocular PMMA (polymethylmethacrylate) lens implantation in camera posterior. The first group consisted of patients with cataract that did not suffer

nor have ever suffered from any local or system disease. The second group consisted of patients with cataract that also suffered from diabetes for at least five years. Both insulin-dependent and insulin-non-dependent patients were included in that group. The objective of this study was to compare intraoperative and postoperative complications in both groups of patients, to compare preoperative and postoperative uncorrected visual acuity, to evaluate diabetic retinopathy before and after surgery and to evaluate diabetic retinopathy influence on the postoperative uncorrected visual acuity.

Materials and Methods

At the Ophthalmology department, Clinical Hospital Osijek, 100 patients underwent cataract extra capsular extraction with intraocular PMMA (polymethylmethacrylate) lens implantation in camera posterior. In the prospective study the first group consisted of 50 patients with cataract older than 65 years, who did not

suffer nor have ever suffered from any local or system disease (further in text: group I). The second group consisted of 50 successively chosen patients with cataract suffering also from diabetes mellitus for at least five years (further in text: group II).

Preoperative examination of patients included: examination of visual acuity by Snellen’s tables, measuring of intraocular pressure (IOT) by aplanation tonometry, camera anterior examination by biomicroscopy, eye gonioscopy (examination of the anterior chamber angle) in order to exclude rubeosis iris and to observe the anterior chamber, biometry – determination of the intraocular lens strength, eye ultrasound in order to find possible complications due to diabetes (diabetic proliferative retinopathy and other). Operations were made either with general or with local anaesthesia. All patients were examined in the early postoperative period – 7 days or six months after surgery. Visual acuity was examined by Snellen’s tables and intraocular pressure (IOT) was measured by aplanation tonometry. The eye was examined by biomicroscope. After that the eye background was examined by direct ophthalmoscope because of possible changes and diabetic retinopathy progression. The material has been analysed by Student’s t-test, χ^2 -test and Kruskal-Wallis test.

TABLE 1
PREOPERATIVE VISUAL ACUITY

	Group I ¹		Group II		Total
	Number	%	Number	%	
0.08–0.25	2	4.0	2	4.0	4
0.01–0.05	19	38.0	26	52.0	45
Hand moving (HM)	25	50.0	20	40.0	45
Light perception (LP)	4	8.0	2	4.0	6
Total:	50	100.0	50	100.0	

Kruskal–Wallis test: $H(1, N=100) = 3.18; p=0.075$

¹ Group I – patients with cataract

Group II – patients with diabetes mellitus and cataract

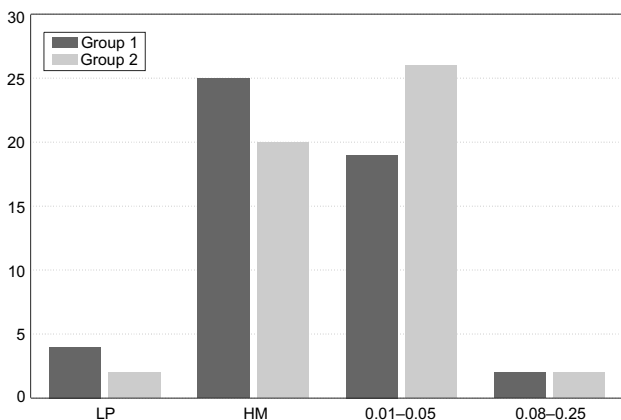


Fig. 1. Preoperative visual acuity.

Results

In the prospective study 100 patients were divided into two groups and examined. The first group consisted of patients that underwent operation of cataract (group I) and the second group consisted of patients that underwent operation of cataract but also suffered from diabetes (group II). In both groups there were more women than men, slightly more in the group II but statistically the difference was not significant. In group I there were 24 men (48%) and 26 women (52%), while in the group II there were 21 men (42%) and 29 women (58%). The age of patients was between 65–89 years. In both groups the visual acuity was poor. Most of the patients had poor visual acuity: moving of a hand in 25 (50%) of patients in group I and 20 (40%) patients in group II – ($p=0.07$) (Table 1, Figure 1). Intraocular pressure was normal in all examined patients. In group II patients suffered from diabetes in average for 9,7 years – the minimum was 5 up to maximum 23 years. 32 (64%) patients suffered from diabetes for 5–10 years, 5 (10%) patients for 10–15 years, 12 (24%) patients for 15–20 years and only 1 patient suffered from diabetes for more than 20 years (Figure 2). According to the type of diabetes, the patients were divided into two groups. 9 (18%) patients suffered from diabetes type I (insulin-dependent) and 41 (82%) patients suffered from diabetes type II (insulin-non-dependent, therapy with oral hypoglycaemic). In group II, 40 (80%) patients did not have diabetic retinopathy. 10 (20%) had diabetic retinopathy of non-proliferative type. 4 of these 10 patients did not have maculopathy and 6 of them had it.

Mild form of postoperative keratopathy was equally present in both groups of patients: in 27 patients in group I and in 25 patients in group II. Stronger keratopathy was much more frequent in group II: in 14 (28%) patients in group II and in 4 (8%) patients in group I ($p<0.05$) (Table 2). Postoperative uveitis was much more frequent in patients in group II. Uveitis serous was present in 10 (20%) patients while uveitis fibrinous was present in 4 (8%) patients ($p<0.001$) (Table 3). Postoperative visual acuity on the 7th postopera-

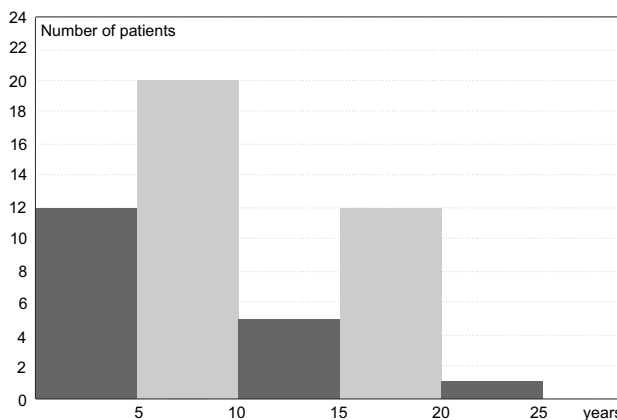


Fig. 2. Patient distribution by duration of Diabetes mellitus.

TABLE 2
POSTOPERATIVE KERATOPATHY

Cornea condition	Group I ¹		Group II		Total
	Number	%	Number	%	
Without changes	19	38.0	11	22.0	30
Keratopathy: Milder form ¹	27	54.0	25	50.0	52
Serious condition ²	4	8.0	14	28.0	18

$\chi^2 = 7.77$, SS = 2, p = 0.021

¹Milder form – biomicroscope showed smaller cornea edema together with 2–3 folds of Descemet membrane; eye background could be seen by ophthalmoscope

²Serious condition – biomicroscope showed more serious cornea edema together with more than 3–4 folds of Descemet membrane due to the cornea opacity; eye background could not be seen by ophthalmoscope

tive day was better in patients in group I. Visual acuity of 0.5 and better had 28 (56%) patients in group I and 21 (42%) patients in group II (p=0.60) (Figure 3). In group I, 44 (88%) patients had clear posterior lens capsula, 4 (8%) patients had mild lens opacity and 2 (4%) had stronger lens opacity. In group II in 31 (62%) patients the posterior lens capsula was clear, 11 (22%) patients had mild lens opacity and 8 (16%) patients had stronger lens opacity. In group II progression of diabetic retinopathy was present in 7 (14%) operated eyes and in 2 (4%) operated eyes diabetic retinopathy of non-proli-

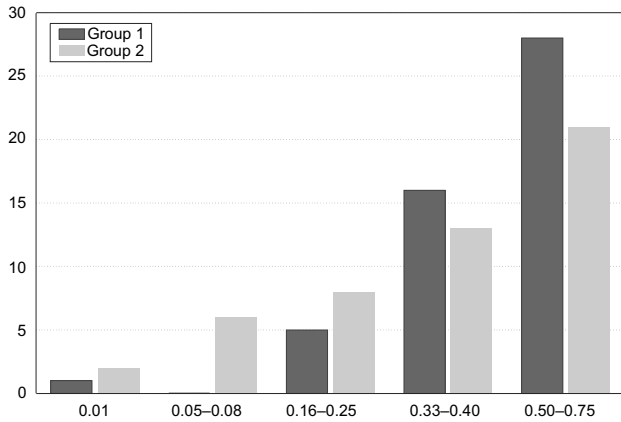


Fig. 3. Results of the uncorrected postoperative visual acuity – seventh day.

TABLE 3
POSTOPERATIVE UVEITIS IN THE EARLY POSTOPERATIVE PERIOD

	Group I		Group II		Total
	Number	%	Number	%	
Without uveitis	49	98.0	36	72.0	85
Uveitis serous	0	0.0	10	20.0	10
Uveitis fibrinous	1	2.0	4	8.0	5

χ^2 Yates = 11.29, SS = 1, p = 0.0008

ferative type has developed. After operation in 3 operated eyes developed maculopathy – in 2 (4%) of them also developed diabetic maculopathy of non-proliferative type and in 1 (2%) eye developed maculopathy, together with progression of diabetic retinopathy. Progression of diabetic retinopathy was found in patients that did not undergo laser therapy before surgery (Table 4). Six months after operation postoperative visual acuity was better in patients in group I. Visual acuity of 0.5 and better had 43 (86%) patients in group I and 34 (68%) patients in group II (p=0.34) (Figure 4).

Discussion and Conclusions

After cataract extra capsular extraction with intraocular PMMA (polymethylmethacrylate) lens implantation in camera posterior in patients with cataract and

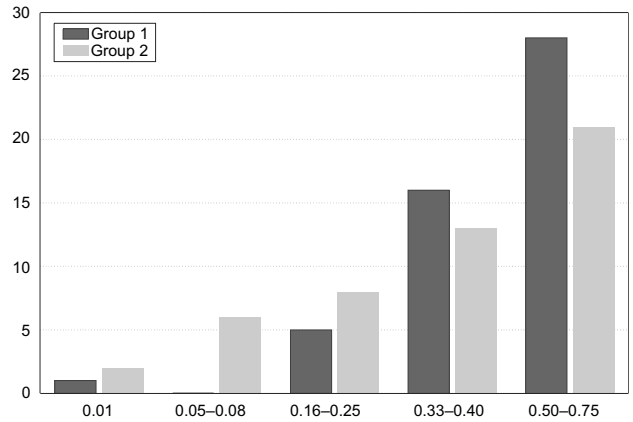


Fig. 4. Results of the uncorrected postoperative visual acuity – after 6 months.

TABLE 4
POSTOPERATIVE CONDITION OF THE EYE BACKGROUND IN PATIENTS WITH DIABETES MELLITUS

Eye background	Operated eye			Eye that was not operated		
	Number	Presence of maculopathy	%	Number	Presence of maculopathy	%
Non-proliferative type of diabetic retinopathy	Developed	2 (2)	4.0	0 (0)	2.0	
	The same condition	3 (0)	6.0	7 (6)	14.0	
	Progression	7 (7)	14.0	3 (0)	8.0	
No retinopathy	38		76.0	40	76.0	
Total:	50			50	100.0	

diabetes mellitus type I and type II, the postoperative complications were more often than in patients with cataract who did not suffer from a system or local diseases: stronger bleeding during operation and also postoperative bleeding due to blood vessels rigidity in diabetics, stronger inflammatory reactions, keratopathy was found in 28% of patients, serous uveitis was found in 20% of patients and fibrinous uveitis was found in 8% of patients, opacity of the posterior lens capsule – mild in 22% of patients and stronger in 16% of patients. All inflammatory reactions were characteristic for diabetics and they were present together with diabetic uveitis and degenerative tissue changes. There is a statistically significant difference in all previously mentioned complications.

Uncorrected visual acuity on the 7th postoperative day was better in patients with cataract – 0.5 and better in 56% of patients, than in patients with cataract and

diabetes mellitus – 0.5 and better was found in 42% of patients. The visual acuity was also better six months after surgery – 0.5 and better was found in 86% patients with cataract and in 68% patients with cataract and diabetes mellitus. The difference was not statistically significant. Postoperative visual acuity was worse in patients with diabetes due to progression of diabetic retinopathy of non-proliferative type in 14% of patients, and due to development of maculopathy in 6% of patients. Diabetic retinopathy progression and development of maculopathy were found only in patients that did not undergo laser therapy before surgery. Results of the operation of cataract in patients with diabetes but without diabetic retinopathy were better and there is no significant difference between those results and results in patients who did not suffer from diabetes. The results are poorer in patients with diabetes and diabetic retinopathy, and even worse if maculopathy was present.

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D. Ivančić

Department of Ophthalmology, Clinical Hospital Osijek, Osijek, Croatia

OPERACIJA KATARAKTE I POSTOPERATIVNE KOMPLIKACIJE U BOLESNIKA SA ŠEĆERNOM BOLEŠĆU

SAŽETAK

Šećerna bolest utječe na funkciju i morfologiju očne leće. Katarakta je druga najčešća komplikacija šećerne bolesti na oku. U prospektivnoj studiji ispitano je 100 bolesnika s kataraktom. Podijeljeni su u dvije skupine. Prvu skupinu čini 50 bolesnika s kataraktom, koji nisu preboljeli sistemsku ili lokalnu bolest. Drugu skupinu čini 50 bolesnika s kataraktom i šećernom bolešću koja traje najmanje pet godina. U obje je grupe na jednak način izvršena operacija katarakte metodom ekstrakapsularne ekstrakcije katarakte, uz implantaciju akrilatne leće u stražnju sobicu. Cilj studije je bio usporedba dviju skupina bolesnika, kako bi se ustanovilo koje su najčešće intraoperativne i postoperativne komplikacije u bolesnika sa šećernom bolešću. Najčešće komplikacije u bolesnika sa šećernom bolešću u postoperativnom tijeku su upalne reakcije i krvarenje, postoperativna keratopatija, serozni i fibrinozni iritis, sa stražnjim sinehijama i sa zamućenjem stražnje kapsule leće kao posljedicom. Postoperativna vidna oštrina lošija je u skupini II bolesnika sedmi dan i nakon 6 mjeseci. Na pogoršanje vidne oštrine djelovala je i dijabetička retinopatija i njezina progresija. Progresija dijabetičke retinopatije i pojava makulopatije pojavila se samo u bolesnika u kojih nije bila izvršena terapija laserom prije operativnog zahvata.