

# Trabeculectomy with and without mitomycin-C in a black African population

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**PURPOSE.** *To evaluate the beneficial effects of intraoperative application of mitomycin-C during trabeculectomy in a black African population in Congo-Kinshasa.*

**METHODS.** *A prospective randomized study in 22 eyes (11 patients) with open-angle glaucoma. All patients underwent trabeculectomy with application of mitomycin-C (0.4 mg/ml for 2.5 min) under the scleral flap in the right eye and trabeculectomy alone in the left eye. Assessment of the clinical outcome included intraocular pressure, visual acuity, visual field and complications. The follow-up was 20 months. Success of the filtering surgery was defined as a final IOP of 21 mmHg or lower without antiglaucoma medications and no further glaucoma surgery necessary.*

**RESULTS.** *The success rate of trabeculectomy was 81.8% in eyes treated with mitomycin-C compared with 63.6% in eyes not receiving this drug. Rates of intraocular pressure reduction were 57.9% and 42.9% respectively. Complications occurred in 36.3% of the eyes managed with mitomycin-C against 9% in the control eyes.*

**CONCLUSIONS.** *Mitomycin-C, as adjunctive treatment during trabeculectomy in black Africans, offers great benefit in lowering IOP, but with a substantial high risk of complications. These data need to be confirmed by further studies in this population. (Eur J Ophthalmol 2001; 11: 261-3)*

**KEY WORDS.** *Trabeculectomy, Mitomycin-C, Black African*

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## INTRODUCTION

Medications that influence the surgical success of filtering operations have been used for decades. Fibroblast proliferation has been recognized as playing a major role in the failure of filtration surgery. After this surgery, fibroblasts migrate and proliferate in the area of filtration and produce collagen and glycosaminoglycans that provide the matrix for wound closure (1). This is why there has been extensive research for agents to reduce this proliferation. Several agents have been tested. These include 5-fluorouracil, bleomycin, doxorubicin, mitomycin-C (MMC), cytarabine, beta-aminopropionitrile (BAPN) and D-

penicillamine. These are mainly used in eyes with a high risk of failure in glaucoma filtering surgery to increase the success of surgery through medical modulation of fibroblast proliferation. MMC, an antibiotic with cytostatic properties, has been used in glaucoma surgery for about ten years. Studies are still being published on its effectiveness and safety of this drug in trabeculectomy. To the best of our knowledge there is only one report concerning the use of MMC in glaucoma surgery in black Africans (2).

We set out to obtain additional data for assessing the beneficial effects of intraoperative application of MMC during trabeculectomy in a black African population.

## MATERIAL AND METHODS

We conducted a prospective randomized study in 22 eyes of 11 black African patients in Congo-Kinshasa. There were 6 males and 5 females, average age 46.8 years, range 29 to 59 years. All had open-angle glaucoma (OAG) diagnosed for the first time. OAG was diagnosed when intraocular pressure (IOP) exceeded 21 mmHg in the presence of optic disc cupping and visual fields (VF) defects. Each patient underwent a trabeculectomy with intraoperative application of MMC in the RE and trabeculectomy alone in the LE. All interventions were performed by the same surgeon (J-C. K.M.) under local (retrobulbar) anesthesia using 2.5 ml of lidocaine and a limbus-based conjunctival flap according to the following procedure: cauterisation, creation of a 3x4 mm limbus-based scleral flap, application of MMC 0.4 mg/ml under the scleral flap for 2.5 min, followed by an abundant rinse with BSS or 0.9% NaCl, excision of the trabeculum, peripheral iridectomy, suture of the scleral flap with two nylon 8 or 9/0 sutures, and the conjunctival flap using a running suture with silk or nylon 7/0. At the end of the intervention, a mixture of dexamethasone and gentamicin was injected subconjunctivally. Post-operative treatment included tetracycline ointment twice a day for 3-5 days, corticosteroid drops three times a day for at least one month and 1% atropine drops twice daily for 1-2 weeks. The second eye was operated after an interval varying from 3 to 5 days. The follow-up was 20 months in all cases.

Assessment of the clinical outcome included IOP, visual acuity (VA), VF and identification of post-operative complications. Success was defined as a final IOP of 21 mmHg or lower without antiglaucoma medications and no further glaucoma surgery necessary. Results were compared with previously reported similar case series.

## RESULTS

Table I displays the pre- and post-operative IOPs of each patient at the end of the follow-up period. The success rates were 81.8% and 63.6% respectively in eyes treated with and without MMC. The overall mean preoperative IOPs were 31 mmHg in RE and 32.1 mmHg in LE. At the end of the follow-up time, the overall mean IOPs were 30.2 mmHg in RE and 31.2 mmHg in LE. At the end of the follow-up time, the overall mean IOPs were 12.7 mmHg and 17.8 mmHg respectively in eyes treated with MMC and in those not receiving this drug, giving IOP reduction rates of 57.9% and 42.9%. Comparison of pre- and post-operative VA and VF at the end of the follow-up showed no differences.

Four (36.3%) of the eyes operated with MMC experienced the following complications: persistent hypotonia (6 mmHg), transitory hypotonia, superficial punctate keratitis and shallow anterior chamber in one eye each. Only one eye without MMC (9%) developed a late bleb formation.

**TABLE I** – AGE (years), SEX, PRE-OPERATIVE IOP (mmHg) AND IOP AFTER TRABECULECTOMY WITH (RE) AND WITHOUT (LE) MMC

No. Patient	Age	Sex	Pre-op. IOP		Post-op. IOP	
			RE	LE	RE	LE
1	47	M	30	28	14	16
2	29	M	26	30	12	22
3	57	F	34	36	14	18
4	54	M	28	28	10	12
5	52	F	28	32	22	24
6	38	F	34	34	12	16
7	49	F	28	26	14	16
8	55	M	30	34	14	24
9	59	F	32	32	10	10
10	55	M	36	36	12	26
11	49	M	26	28	6	12

## DISCUSSION

The success rates of surgery and the IOP reduction were better in eyes treated with MMC than eyes not treated with this antimetabolite. This lends further support to the idea that MMC does improve the success rate of trabeculectomies, as stated by several authors (2-14). We believe this high rate of success is not ascribable to the mode of application of MMC but rather to its antimetabolic effect, since similar results have been obtained after other modes of application (3, 4, 6, 13).

Trabeculectomy for the treatment of open-angle glaucoma has to be completed with intraoperative antimetabolites such as MMC. However, despite its effectiveness and safety in lowering IOP, trabeculectomy with MMC has been associated with a number of complications such as conjunctival wound leakage, hypotony, shallow anterior chamber, choroidal detachment, bleb-related infection and loss of corneal endothelial cells. In the present small series, the incidence of complications were higher in eyes

receiving MMC than in eyes treated by trabeculectomy alone. This is in accordance with some previous reports (8, 10). In contrast, Budenz et al (15) recently found no differences in complications between eyes receiving MMC and those not receiving it.

Our results rule out individual differences and are similar to most previous reports on this subject. This means that MMC, as an adjunctive treatment during trabeculectomy in black Africans offers great benefit in lowering IOP with, however, a substantial high risk of complications. The present data need to be confirmed by further studies in this population.

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