

Study of Trabeculectomy with or without Mitomycin C

Sarita Panigrahi¹, Karnati Jyothi^{2*}

¹Assistant Professor, Hitech Medical College and Hospital, Rourkela, Odisha, India

²Associate Professor, Department of Ophthalmology, MNR Medical College and Hospital, Sangareddy, Telangana, India

Received: 15-10-2021 / Revised: 26-12-2021 / Accepted: 13-01-2022

Abstract

Glaucoma is a group of disorders that are characterized by widely diverse clinical and histopathological manifestations which was apparently recognized by the Greeks as early as 400 B.C. Although an association with elevated intraocular pressure is found in 'Arabian writings' in the 10th century it was not until the 19th century that glaucoma was clearly recognized as a distinct group of ocular disorders. Glaucoma is one of the main blinding disease in our country. According to a World Health Organization report glaucoma is the third most common cause of blindness in the world. The sample size was 50 and the study was prospective and non-randomized study. Out of 50 patients 25 patients were posted for simple trabeculectomy (Group A) and 25 patients were posted for trabeculectomy with Mitomycin-C (Group B) after taking their informed written consent. The study comparing the effects of trabeculectomy with and without mitomycin-c in glaucoma patients were undertaken in Department of Ophthalmology, Hitech Medical College and Hospital, during the period of 2019-2021. The overall goal for all glaucoma treatment is to preserve useful vision. Glaucoma is a multifactorial disease but the intraocular pressure is still the only known treatable risk factor. Substantial pressure reduction is difficult to achieve without filtering surgery.

Keywords: Glaucoma, trabeculectomy, Mitomycin C.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Glaucoma is a group of disorders that are characterized by widely diverse clinical and histopathological manifestations which was apparently recognized by the Greeks as early as 400 B.C. Although an association with elevated intraocular pressure is found in 'Arabian writings' in the 10th century it was not until the 19th century that glaucoma was clearly recognized as a distinct group of ocular disorders. Glaucoma is one of the main blinding disease in our country. According to a World Health Organization report glaucoma is the third most common cause of blindness in the world[1]. About 3.9% (0.23 million) of total blindness is due to glaucoma. According to blindness survey of India carried out by national programme on control of blindness 1986-89 glaucoma as a cause of blindness accounts for 1.7% of blind population. The national survey on blindness 2001-2002 indicates that glaucoma causes 5.8% of the total visual impairment and blindness cases in India. Sood et.al. 1968 conducted a study on the prevalence of glaucoma in 496 individuals in the general population of Pondichery in the age group above 35 years. A prevalence of 7.2% was detected. Intraocular pressure is the key risk factor for development and progression of glaucoma and lowering of IOP delays the onset and progression of the disease process so in the management of glaucoma the target is to lower the intraocular pressure by medical or surgical methods. With the availability of wide variety of antiglaucoma medications, surgery has become an uncommon practice in India in common glaucoma management. But in the developing countries like India surgery is still an intervention of choice in glaucoma patients. Among all the available modes of surgical treatment 'trabeculectomy' is the most common practiced one. Trabeculectomy is a surgical procedure used in the treatment of glaucoma to relieve intraocular pressure by removing part of eyes trabecular meshwork and adjacent structure. It is the most common glaucoma surgery performed and allows drainage of aqueous humour

from within the eye to underneath the conjunctiva where it is absorbed. Mitomycin C inhibits the proliferation of tenon's capsule and episcleral fibroblast at surgical site when applied during surgery. Its use is reserved for eyes that have a high likelihood of failure or have previously failed conventional filtration. Mitomycin-C is administered intra-operatively as a single topical application. Dose range from 0.01% -0.05% with application time of 1 to 5 minutes. Clinical studies have revealed the efficacy of Mitomycin-C in improving the outcome of trabeculectomy[2,3].

Study Setting and Methodology

The sample size was 50 and the study was prospective and non-randomized study. Out of 50 patients 25 patients were posted for simple trabeculectomy (Group A) and 25 patients were posted for trabeculectomy with Mitomycin-C (Group B) after taking their informed written consent. One eye of each patient was included for The present study of 50 patients was undertaken in the Department of ophthalmology, Hitech Medical College and hospital over a period of 2 years i.e. 2019-2021. The patients for the study were selected from the indoor patients of the department during the above-mentioned period. The study keeping the total number of study eyes 50.

Inclusion criteria

1. Patients who were diagnosed with Primary Open Angle Glaucoma or Primary Angle Closure Glaucoma.
2. Patient presenting with symptoms of headache, eyeache, defect in visual field, frequent change in presbyopic glasses.
3. Cases of congenital glaucoma, uveitic glaucoma, neovascular glaucoma, aphakic or pseudoaphakic glaucoma. Patients giving consent for use of intraoperative Mitomycin-C during trabeculectomy.

Exclusion criteria

1. Patients with unstable vitals requiring primary systemic stabilization.
2. Patients suffering from HIV and Hepatitis-B.
3. Patients with absolute glaucoma or end stage glaucoma.
4. Patient with previous trabeculectomy with thinned sclera.

A detailed history including present, past and family history were recorded. The general examination of the patient was undertaken thoroughly with detailed local examination and the required

*Correspondence

Dr. Karnati Jyothi

Associate Professor, Department of Ophthalmology, MNR Medical College and Hospital, Sangareddy, Telangana, India.

E-mail: jyothikarnati@gmail.com

investigation were performed carefully. The relevant data were recorded as in the following format.

Result

Preoperative evaluation/ surgical procedure

All patients with a high intraocular pressure were treated medically to bring down the IOP to below 21 mm hg the medications used were pilocarpine 2% (6 hourly), timolol 0.5% 12 hourly, Acetazolamide 250 mg 8 hourly with an antacid or if not controlled i.v. mannitol 20% with a dose of 1 gm per kg body weight administered 1 hour before surgery. 24 hours before operation, systemic antibiotics were started and local antibiotics were instilled 6 hourly in the eye to be operated, the eye lashes were clipped off and xylocaine sensitivity test was done All the selected patients were divided into two groups , in one group, simple trabeculectomy without mitomycin -c was performed and in other group trabeculectomy with mitomycin- c was fashioned.Under peribulbar anaesthesia, the eye was operated and in post-operative examination Visual acuity,Intraocular pressure, Bleb: size, shape, position, transparency, vascularity and leakage,Conjunctiva-The observation of the study is summarized as follows:

chemosis, congestion, haemorrhage,Cornea- edema, epithelial erosion and KPs,Anterior Chamber- depth and hyphaema, Iris- iritis were monitored.In each follow up visits upto 6 montns, the patients of each group were examined carefully according to the parameters given above and the result of surgical procedure was compared with each other to find out the better one.

Discussion

The study comparing the effects of trabeculectomy with and without mitomycin-c in glaucoma patients were undertaken in department of Ophthalmology, M.K.C.G. medical college, Berhampur, Odisha, during the period of 2019-2020. 50 glaucoma patients were selected from the OPD and IPD, Dept. of ophthalmology, Hitech Medical College and Hospital in each patient, one eye was included for the study, keeping the total no. of study eyes , 50. They were divided into 2 groups, in Group A, trabeculectomy without mitomycin-c and in Group B trabeculectomy with mitomycin-c were performed[4,5]. After surgery the patients were discharged after 5 days and then followed up at 2 weeks, 6 weeks, 3 months and 6 months[6,7].

In Group A	In Group B
<p>About 21(84%) no. of patients were in the range of 41-60 years of age . In group A 14(56%) males and 11(44%) females were included. Maximum patients were from urban areas(72%) as compared to rural areas(28%). In group A 56% were POAG and 44% were PACG patients. The mean baseline intraocular pressure , i.e., the IOP at the time of presentation before any medical or surgical treatment was 30.44+/-7.36mmhg. The introperative complications were few. There was button holing of conjunctiva in 3 cases. Tearing of Tenon’s capsule seen in 1 case and Perforation of sclera flap seen in 1 case. In the early postoperative period, shallow anterior chamber and overdraining blebs were a common feature in this group. Other frequent complications were hyphema ,non filtering blebs and wound leak which was well managed by restitching. The IOP were within the normal range, excepting, there was a slight upward shift in IOP in later visits. The appearance of the filtering bleb in the follow up was satisfactory except in 5 cases in which the bleb was encysted and in 3 cases in which the bleb was hypertrophied, but the IOP in that case was also below 21 mmhg. There was progression of visual deterioration in 2 cases and hypotonous maculopathy in 3 cases inspite of decreased IOP postoperatively. Unfortunately, there occurred cataractous changes in 5 cases leading to visual impairment later.</p>	<p>About 20(80%) no. of patients of the study population were in the range of 41-60 years of age with Mitomycin-c. In group B18 (72%) males and 7(28%) females were included. Maximum patients were from urban areas(80%) as compared to rural areas(20%). In group B 9 (36%) of patients were Aphakic Glaucoma , 7(28%) of patients were POAG ,3(12%) of patients were neovascular glaucoma,3(12%) of patients were pseudophakic glaucoma. The mean baseline IOP at presentation was 30.58+/-7.22 mmhg . Intraoperatively buttonholing of conjunctiva never occurred but in 2 cases, there was perforation of scleral flap and in 1 case, there was loss of scleral flap and at the end in 2 cases, the conjunctival closure was not perfect. In the early postoperative period there was shallow AC in 2 cases and hypotony in 5 cases. Postoperative hyphaema, wound leak, non filtering bleb and subconjunctival hemorrhage were rare. The IOP in follow up visits , were reduced to normal range . Still in 3 cases there was encysted bleb and in only 1 case there was hypertrophy of bleb. In spite of all these, in Group B there was visual deterioration in 2 cases. Only in 2 cases, cataractous change was found in the lens at a later date.</p>

Conclusion

The overall goal for all glaucoma treatment is to preserve useful vision. Glaucoma is a multifactorial disease but the intraocular pressure is still the only known treatable risk factor. Substantial pressure reduction is difficult to achieve without filtering surgery. Antiproliferatives (MMC) have increased the odds of retaining the pressure reduction after filtering surgery, and as a result they have decreased the progression of visual field defects and optic nerve damage. With regards to complication rates with MMC, early hypotonicity is predominant, followed by shallow anterior chamber and hyphaema. Incidences obtained from this analysis compare very favourably with results from international studies. In fact, there were no significant differences in the trends and percentages regarding complications, IOP drop and control between results from our data and those from international studies. The success rates of surgery and the IOP reduction were better in eyes treated with MMC than eyes not treated with this antimetabolite. We believe this high rate of success is not ascribable to the mode of application of MMC but rather to its ant metabolic effect, since similar results have been obtained after other modes of application. Our results rule out individual differences and are similar to most previous reports on this subject. This means that

Conflict of Interest: Nil Source of support: Nil

MMC, as an adjunctive treatment during trabeculectomy offers great benefit in lowering IOP.

References

1. Foster.A. World distribution of blindness community eye healthy 1980;14:280-4.
2. Khaw P.T, Wilkins.A . Antifibrotic agents in glaucoma surgery. In: Vanoff .M, Dukes J.S, Eds.Ophthalmology 1 st ed. London: Mosby 1999;p312-8.
3. Scott IU, Schiffman J, Nicoleta M.T, Rueda J.C, Tsai J.C,et.al .Outcomes of primary trabeculectomy with use of adjunctive mitomycin c . Arch. Ophthalmol.1998;116:286-91.
4. Greenfield DS, Suner IJ, Miller MP, et.al. Endophtalmitis after filtering surgey with mitomycin. Arch.ophtalmology; 1996;114:943-9.
5. Zacharia P.T, Depperman S.R.Ocular hypotony after Mitomycin C, AMJ Ophthalmol;1993;116:314-26.
6. Duke E S. system of ophthalmology. XI vol.(ed.)Henry Kimpton; 1976:379-56.
7. Kronfeld P.The rise of filter operations, surv ophthalmology 1972;172-168.