

ORIGINAL ARTICLE

Trabeculectomy with Mitomycin C and Intra-Ocular Pressure in Congenital Glaucoma Patients

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ABSTRACT

Objective: The purpose of this study is to evaluate the mean change in intraocular pressure following trabeculectomy with Mitomycin C in patients who present with congenital glaucoma.

Study Design: Observational/ Cross-sectional

Place and Duration: Data was collected from different hospitals of Pakistan, including Jinnah International Hospital, Abbottabad and Department of Ophthalmology, Sahara Medical College, Narowal from December 2021 to May 2022.

Methods: The study included 62 patients, both male and female, with primary congenital glaucoma, ranging in age from birth to five years. After receiving signed permission from patients' legal guardians, we were able to record their demographic information. Trabeculectomy using 0.4mg/ml Mitomycin C was performed on all of the patients. Mitomycin C was placed for 2 minutes under the scleral flap. The intraocular pressure was measured before surgery and again 12 days later. Statistical analysis was performed using SPSS 22.0.

Results: Included children had mean age 1.9±3.16 years. We found that, majority of the patients 39 (62.9%) were males and 23 (37.1%) cases were females. The mean intraocular pressure before and after surgery was significantly different, with a p-value of 0.002 (29.41±5.22 Vs 15.17±1.73).

Conclusion: It has been determined that doing a trabeculectomy while administering mitomycin C results in a significant decrease in intraocular pressure. Following surgery, a substantial reduction in intraocular pressure was noted by the attending physician.

Keywords: Intra-ocular Pressure, Primary Congenital Glaucoma, Mitomycin C, Trabeculectomy

INTRODUCTION

The low frequency of congenital glaucoma does not diminish its importance as a leading cause of blindness in children (1:10,000 births).[1] Trabeculectomy and goniotomy are the most common surgical treatments used to treat primary congenital glaucoma. Trabeculectomy is typically done as a last resort after non-surgical attempts to lower intraocular pressure [2-4]. Trabeculectomy for primary congenital glaucoma has a mixed success rate. Success rates in series range from 35% to 85%; these numbers vary widely based on factors such as the number of procedures in the series, the duration of follow-up, and the patient demographic. [5] While PCG was once thought to be incurable, it is now treatable through a number of surgical methods with varying degrees of success. There have been a number of studies looking at the several ways in which trabeculectomy may be performed. A recent study indicated that 5/0 prolene suture circumferential trabeculectomy was more effective than traditional trabeculectomy [6].

An further research [6] found that Harm's trabeculectomy trabeculectomies done at 240 degrees (120 degrees superior and 120 degrees inferior) were as effective.

Additionally, the [7] Trab 360 device/OMNI (comprised of a stainless steel needle with internal 4/0 nylon blue filament) is handy and effective in producing desirable outcomes. In terms of intraocular pressure (IOP) reduction, viscotrabeculectomy has been shown to be somewhat more successful than traditional trabeculectomy. With the exception of the research by Walton,[9] other papers have collected the outcomes of various treatments for paediatric glaucoma under a single umbrella.

The results of Azuara-Blanco et al.[11] in aphakic childhood glaucoma were mixed. Results showed that after 1 year of trabeculectomy with MMC, none of the aphakic eyes (n=8) had IOP 21 mmHg without antiglaucoma medication and had clinically stable glaucoma. They noted that a different treatment strategy for aphakic childhood glaucoma could be necessary. Successful outcomes for individuals with aphakic glaucoma following congenital cataract surgery with MMC trabeculectomy ranged from

62% to 82% across the other published groups. [12,13] However, most studies only comprised a small number of patients, and their outcomes were either not reported or were unclear.

Patients with primary congenital glaucoma who had trabeculectomy enhanced with Mitomycin C for treatment of elevated intraocular pressure were analysed in this research.

MATERIALS AND METHODS

This cross-sectional/observational study was conducted at Jinnah International Hospital, Abbottabad and Department of Ophthalmology, Sahara Medical College, Narowal, from December, 2021 to May, 2022. This study included 62 patients, both male and female, with primary congenital glaucoma, ranging in age from birth to five years old. After obtaining written consent from parents or guardians, we recorded the patient's complete demographic information, including age, sex, and eye. Patients with a history of ocular trauma or complications, prior ocular surgery, ocular trauma, or retinal detachment were not included in the analysis.

The diagnosis was confirmed by an examination performed while the patient was unconscious. The two sets of eyes were tested. Under general anaesthesia, all patients had a trabeculectomy performed while 0.4mg/ml Mitomycin C was injected beneath the scleral flap for 2 minutes. Using 10/0 nylon, we sutured the scleral flap's four corners. The conjunctiva was stitched shut with 10/0 nylon suture. The first postoperative day marked the beginning of a 10-week course of a topical combination of steroid and antibiotic. At the 12-day mark following surgery, a follow-up was conducted.

A Perkins tonometer was used to measure intraocular pressure before and after surgery, and to compare the two groups' average changes. SPSS 22.0 was used for the data analysis. Average Standard Deviation was used. The mean difference between IOP before and after surgery was analysed using the chi-square test.

RESULTS

We found that, majority of the patients 39 (62.9%) were males and 23 (37.1%) cases were females.(figure 1)

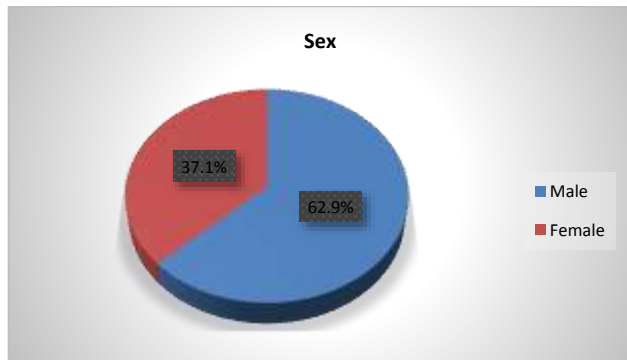


Figure-1: Sex of the presented cases

Included children had mean age 1.9±3.16 years. There were 35 (56.5%) had left eye and 27 (43.5%) case had right eye. (Table 1)

Table 1: Patients enrollment details

Variables	Frequency	Percentage
Mean age	1.9±3.16	
Side of Eye		
Right	27	43.5
Left	35	56.5

The mean intraocular pressure before and after surgery was significantly different, with a p-value <0.002 (29.41±5.22 Vs 15.17±1.73). (Table 2)

Table 2: Mean variation in intraocular pressure on day 12 following surgery

Variables	Before surgery	After Surgery	P-value
Mean IOP mmHg	29.41±5.22	15.17±1.73	<0.002

There was a statistically significant drop in males' IOP from preoperative 28.16±3.41 mm Hg to postoperative 16.19±4.37 mm Hg on day 12. Females had a preoperative mean IOP of 29.9±2.50 and a postoperative mean IOP of 15.13±6.23, with the postoperative value being significantly lower (p<0.002). (Table 3)

Table 3: Differences in the mean increase or decrease of intraocular pressure by gender

Variables	Mean IOP before surgery	IOP after surgery	P-value
Male	28.16±3.41	16.19±4.37	<0.002
Female	29.9±2.50	15.13±6.23	<0.002

DISCUSSION

Surgery is usually necessary at an early age for cases with childhood glaucoma. Treatment options for primary congenital glaucoma often include goniotomy and trabeculectomy. They are both risk-free and seldom cause any problems. [14] Failure of goniotomy and trabeculectomy usually leads to trabeculectomy. However, a corneal diameter of > 14 mm or the presence of other ocular abnormalities (Peters, Sturge-Weber, Aniridia, etc.) might diminish the success rate of first trabeculectomy as a therapy for paediatric glaucoma. [15]

In current study 62 cases of primary congenital glaucoma were included. Majority of the patients 39 (62.9%) were males and 23 (37.1%) cases were females. Included children had mean age 1.9±3.16 years. There were 35 (56.5%) had left eye and 27 (43.5%) case had right eye. These results were comparable to the previous studies.[16,17] Despite its widespread use, trabeculectomy remains technically challenging in infants with

congenital glaucoma due to abnormalities in their limbal architecture and scleral thickness, which can result in scleral perforation. Also, the thick fascia of the tenon and the heightened fibroblastic reactivity throughout the healing phase are thought to reduce the procedure's success rate in young children. Therefore, antimetabolites like MMC have become standard treatment for paediatric glaucoma because of their proven efficacy.[18]

Rehman M et al. [19] found that the mean intraocular pressure dropped from 29.81 ± 4.80 mm Hg preoperatively to 17.21 ± 3.82 mm Hg postoperatively, with a p-value of 0.002. Similar to these results, we found that the mean intraocular pressure before and after surgery was significantly different, with a p-value <0.002 (29.41±5.22 Vs 15.17±1.73). Successful intraocular pressure (IOP) reduction after mitomycin C-augmented trabeculectomy. 360-degree trabeculectomy using a catheter light is becoming increasingly common. [20] Multiple studies found that the success rate of lighted catheter 360 degree trabeculectomy was greater than that of traditional trabeculectomy. [21] The secondary technique of microcatheter aided trabeculectomy (MAT)20 has been shown to be safe and successful in lowering IOP. Both MAT and 2-site trabeculectomy using a rigid trabectome have been shown to be successful. [22]

Just a handful of reports on PCG operational studies have come out of Pakistan. The average intraocular pressure (IOP) of individuals with primary congenital glaucoma dropped from 30 to 12 mm of Hg in a research conducted at Bolan Medical College Quetta. [23] Another research including 17 PCG patients found that trabeculectomy was effective in lowering intraocular pressure in 77 percent of instances. [24] In patients with primary congenital glaucoma, a reduction in IOP from 32 to 13 mm of Hg was achieved with a combination of trabeculectomy and enhanced trabeculectomy. [25]

Different racial/ethnic groups, age ranges, concentrations of mitomycin used, and average follow-up times make it challenging to compare the success rates of different studies including children with PCG. In terms of intraocular pressure (IOP) management, the surgical result of trabeculectomy is clearly inferior in the paediatric population compared to that of adult patients. [26]

CONCLUSION

It has been determined that doing a trabeculectomy while administering mitomycin C results in a significant decrease in intraocular pressure. Following surgery, a substantial reduction in intraocular pressure was noted by the attending physician.

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