Comparison of trabeculectomy with mitomycin C in patients of vernal keratoconjunctivitis with steroid induced glaucoma versus patients with high risk glaucoma

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Objective
The study set out to compare the outcome of trabeculectomy augmented with mitomycin C in patients who had vernal keratoconjunctivitis with steroid induced glaucoma to those with other high risk features.

Method
A prospective comparative analysis of 35 eyes of 35 patients (14 vernal keratoconjunctivitis and 21 who had other high risks conditions in their eye) who underwent trabeculectomy with mitomycin C was carried out. The “vernal keratoconjunctivitis” group consisted of patients who developed glaucoma secondary to use of topical steroids. The “high risk” group consisted of patients who had developed glaucoma after cataract extraction (pseudophakic glaucoma), lens subluxation, penetrating keratoplasty, whose glaucoma was uncontrolled after trabeculectomy (failed trabeculectomies) as well as patients who had, iridocorneal endothelial (ICE) syndrome and those with uncontrolled glaucoma on maximal tolerated medical therapy. Successful outcome was defined as intraocular pressure (IOP) < 20 mmHg at two months with no medications. Failure was defined as IOP > 21 mmHg at two months. The patients were followed-up for two years for development of complications.

Results
Trabeculectomy for vernal keratoconjunctivitis had a significant lowering of IOP < 21 mmHg (p=0) as compared to high risk group (p=0.55).

Conclusions
Trabeculectomy with mitomycin C is a safe and effective procedure for steroid induced glaucoma in patients with vernal keratoconjunctivitis who develop glaucoma secondary to use of topical steroids. (Rawal MedJ 2009; 34:54-57).

Keywords
Trabeculectomy, mitomycin C, vernal keratoconjunctivitis.

INTRODUCTION
Glaucoma is ranked as the second commonest cause of blindness in the world.1 Trabeculectomy treatment for glaucoma which lowers the intraocular pressure.2 Wound healing after trabeculectomy is the leading cause of failure in glaucoma filtration surgery. This is due to proliferation of fibroblasts in the conjunctiva and Tenon’s capsule.3 Mitomycin C (MMC) is an antimetabolite used during the initial steps of trabeculectomy to prevent excessive postoperative fibrosis and thus reduce the risk of failure. MMC has been used in glaucoma surgery for a number of years.4,5,6 Glaucoma associated with steroid use in vernal keratoconjunctivitis (VKC) carries a high risk of surgical failure.7 Although trabeculectomy augmented with MMC is the suggested surgical treatment for refractory glaucoma in high risk eyes,8 the rate of success of trabeculectomy with MMC for secondary glaucoma in VKC has not been adequately documented.

METHOD
This is a prospective comparative study of patients who had undergone trabeculectomy with MMC in Al-Shifa Trust, Eye Hospital Rawalpindi, and Shifa Foundation Community Health Center, Islamabad between 2002 and 2007. The patients were divided into two groups. The “vernal keratoconjunctivitis” group included patients who had VKC with steroid induced (secondary) glaucoma. The “high risk” group included patients who developed glaucoma secondary to cataract extraction (pseudophakic glaucoma), ICE syndrome, lens subluxation, penetrating keratoplasty as well as patients whose glaucoma was not controlled after initial trabeculectomy (failed trabeculectomy). Diagnosis
of VKC was made on classical clinical features of perilimbal pigmentation, limbitis, giantpapillae and seasonal association of symptoms. Patients who underwent cataract surgery with trabeculectomy (combined extraction) were excluded from study. All trabeculectomies were done by the same surgeon proficient in procedure. After surgery, the patient was started on topical steroids administered every 2 hours together with tobramycin eye drops four times daily and atropine eye drops twice a day. Medication was tapered off and subsequently stopped in 4 to 6 weeks time depending on the amount of uveitis and bleb function. Intraocular pressure was measured using Goldmann's applanation tonometer. Statistical analysis was done by applying “t”-test using SPSS version 10.0.

RESULTS
In total 35 eyes of 35 patients were reviewed. The “vernal keratoconjunctivitis” group included 14 patients (14 eyes). The “high risk” group included 21 patients (21 eyes) (Table 1). There were 19 (54.3%) male patients and 16 (45.7%) female patients. The age ranged between 13 years and 67 years. Figure 1 shows pre-operative intraocular pressure in both groups. The indication of surgery in both groups was uncontrolled intra-ocular pressure defined as IOP > 21 mmHg, with progressive damage to the optic nerve head.

Table 1. Table showing high risk condition in patients in “high risk” group

<table>
<thead>
<tr>
<th>S/no</th>
<th>High Risk Condition</th>
<th>Number of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Psueodophakic glaucoma</td>
<td>7</td>
<td>33.3%</td>
</tr>
<tr>
<td>2</td>
<td>Failed trabeculectomy</td>
<td>6</td>
<td>28.5%</td>
</tr>
<tr>
<td>3</td>
<td>Uncontrolled glaucoma on maximal tolerated medical therapy</td>
<td>4</td>
<td>19%</td>
</tr>
<tr>
<td>4</td>
<td>Lens subluxation</td>
<td>2</td>
<td>9.5%</td>
</tr>
<tr>
<td>5</td>
<td>Irido-conreal-endothelial syndrome</td>
<td>1</td>
<td>4.8%</td>
</tr>
<tr>
<td>6</td>
<td>Penetrating keratoplasty</td>
<td>1</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

A shallow anterior chamber and low IOP (< 10 mmHg) were noted in almost all patients after trabeculectomy with MMC. This improved in two to three weeks time. The complications seen in patients are shown in Table 2. One case had endophthalmitis, after swimming. Inflammation was controlled in time and preoperative vision was restored. Tenon's cyst formation required digital massage and needling of the cyst is two cases but they reformed again.

DISCUSSION
The success rate of trabeculectomy in eyes without any high risk factors has ranged between 80 and 90%. Prolonged use of steroids in VKC leads to secondary glaucoma with IOP as high as 40 mmHg. Congestion of the conjunctiva is a feature of VKC that confounds the surgeon from taking the decision to perform surgery because inflammation (due to congestion) in the eye leads to scarring which is the cause of failure of trabeculectomy in these patients. Much of the results of trabeculectomies with MMC are available for multiple high risk characteristics.
such as pseudophakia, \(^\text{10}\) childhood glaucoma, \(^\text{11}\) and uveitis. \(^\text{12}\) No data is available on the outcome of trabeculectomy with MMC in steroid induced glaucoma for VKC patients, as this is principally a disease of warm climates, \(^\text{13}\) thus generates minimal interest in the western world.

In our study, VKC patients who underwent glaucoma medication, trabeculectomy with MMC had a better post operative control of IOP in spite of ocular congestion than the patients in high risk group. Polycystic blebs and Tenon's cyst blebs were the commonest types seen after surgery in both groups. The formation of a Tenon's cyst was probably secondary to the formation of a limbus based flap rather than the use of MMC. None of the patients developed a bleb leak, corneal edema or collapsed anterior chambers after surgery. Raising a limbus based flap reduces the chances of exposure of the cornea to MMC and at the same time reduces the chance of a bleb leak as the conjunctiva and Tenon's capsule are sutured separately in two layers. It also offers the advantage of use of digital massage in cases with early spike of IOP. This gives excellent results if performed regularly. In follow-up for up to two years, thinning was noted in 3 polycystic blebs in the “vernall keratoconjunctivitis” group. Amniotic membrane grafts were tried in two patients. After the graft withered off, the bleb regained its prior form. Patients should be warned against splashing their eyes with water or swimming as one patient with a polycystic bleb developed endophthalmitis 2.5 years after surgery.

### CONCLUSIONS

All patients of VKC on treatment should be monitored regularly for a steroid induced rise in IOP. If such a rise is not controlled after cessation of topical steroid therapy and initiation of anti glaucoma medication, trabeculectomy with MMC should be seriously considered.

### REFERENCES

Corrigendum

Please read the following abstract instead of abstract printed on page 201 of vol 33, No. 2.

The oversight is regretted.

Hepatic dysfunction is frequent in varicella Infection

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Objective
To determine frequency and severity of hepatic dysfunction in adult chickenpox patients admitted in our hospital.

Method
This was a hospital based descriptive study conducted from January 2005 to December 2007 at the Infectious Diseases Unit, Rashid hospital Dubai, UAE. The demographics, clinical information, radiological and biochemical changes observed in each patient were entered in a proforma. Full blood count, liver function tests, blood sugar, urea and electrolytes were done for all the patients, whereas, patients with clinical and/or biochemical evidence of hepatic dysfunction were subjected to viral hepatitis serology, coagulation profile, blood culture and ultrasound abdomen. Management was done as per standard guidelines for the management of chickenpox and its complications.

Results
A total of 105 patients were entered into the study. Serum alanine transaminases (ALT) levels were above the reference range in 50.9%. Among the 52 patients with raised serum ALT levels, 16 (30.7%) had levels >3 times, 4 (7.6%) had >5 times and 5 (9.6%) had >10 times of normal levels. Serum bilirubin was increased above the normal value in 20% and was greater than 3-folds in 4.9%. High frequency of thrombocytopenia (p<0.009), pneumonia (p<0.004), impaired renal function (p<0.01) and disturbed coagulation profile (p<0.01) were observed in patients with hepatic dysfunction. Overall, five (4.9%) patients expired and two (1.9%) of them had acute fulminant hepatic failure.

Conclusions
We observed that liver is frequently involved in adult chickenpox patients and the severity of hepatic dysfunction ranges from mild elevation of transaminases levels to acute fulminant hepatic failure. (Rawal Med J 2008;33:201-204).

Keywords
Hepatic dysfunction, varicella, adults, ALF.