A TWO YEARS AUDIT OF GLAUCOMA IN ADMITTED PATIENTS AT HAYATABAD MEDICAL COMPLEX, PESHAWAR

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ABSTRACT

Objective: To determine the demographic pattern and types of glaucomas and to evaluate the different types of operations performed in terms of efficacy and safety.

Material and Methods: Hospital based retrospective case study. 2 years, from October 1999 to September 2001.

Results: Out of 6382 patients requiring admission, glaucoma accounted for 331 (5.18%). The number of male patients was more than females. The mean age at the time of presentation was 40 years. The most common type of glaucoma requiring admission was primary glaucoma (63.86%), primary angle closure glaucoma being more common (28.91%) than primary open angle glaucoma (22.40%) and primary congenital glaucoma (9.63%). Secondary glaucoma constituted (36.14%) of the total glaucomas. Trabeculectomy was the most common type of operation (65%) performed for the control of glaucoma. Shallow anterior chamber was the most common complication (22.96%), followed by hyphema (11.48%) and choroidal detachment (5.55%). Trabeculectomy was successful in controlling intra-ocular pressure in 83.70% of cases. Cyclocryopexy was successful in controlling intraocular pressure in neovascular glaucoma in 66.66% cases. Cataract extraction was required for lens induced glaucoma and paracentesis for traumatic hyphema.

Conclusion: Primary glaucoma is the most common type of glaucoma requiring admission to hospital. Primary close angle glaucoma is a more common cause of admission to hospital than primary open angle glaucoma. Secondary glaucoma is an important cause of glaucoma in this part of the world. Trabeculectomy is an effective and relatively safe procedure for management of glaucoma in Pakistan.

Key words: Primary close angle glaucoma, Secondary glaucoma, Trabeculectomy

Introduction

Glaucoma is a potentially blinding disease of global importance. The number of people with primary glaucoma in the world by the year 2000 was estimated at nearly 66.8 million, with 6.7 million suffering from bilateral blindness. Glaucoma is the second leading cause of blindness after cataract (16 million).[1]

Glaucoma is the fourth commonest cause of blindness in Pakistan.[2] Mostly our people are poor and illiterate. They only present when the disease is far advanced and has caused profound loss of vision. Lack of effective district based eye care services is also a hurdle in the early management of glaucoma. The current treatment strategies include anti-glaucoma drugs like beta-adrenergic antagonists, cholinergic agonists, adrenergic agonists or carbonic anhydrase inhibitors both topical and systemic and the prostaglandin analogues. Failure of medical therapy leaves no choice but to opt for laser or surgical intervention. Laser trabeculoplasty is associated with high rates of failure. Therefore the treatment of choice in our setting is surgical intervention. Trabeculectomy with and without antimetabolites is the most common filtering surgery performed with variable success rates.

The objective of the audit of admitted glaucoma patients was three fold:

a) To determine the relative frequency of the type of glaucoma requiring hospitalization in Pakistan.

b) To study the different management plans for the different types of glaucoma.

c) To determine the safety and efficacy of trabeculectomy as a surgical treatment for most glaucomas.

Material and Methods

A retrospective study of patients admitted to Khyber Institute of Ophthalmic Medical Sciences, Hayatabad Medical Complex, Peshawar was carried out. The study included patients admitted during the period from October 1999 to September 2001. The history charts of glaucoma patients admitted during the period were re-viewed. All the relevant examination data was retrieved from the notes, which included visual acuity recorded both aided and unaided. Reference to corneal clarity, epithelial oedema, krukumberg spindle, iris neovascularization and atrophy, lens opacities, pseudo-exfoliation, glaucomaflecken, posterior and or peripheral anterior synechiae and fundus for optic disc cupping/atrophy and neovascularization was noted. Any gonioscopic findings of anterior chamber angle were recorded. Intraocular pressure measurements with applanation tonometer taken at the time of admission and discharge were noted. Visual field record of Goldmann/Humphrey was re-evaluated.

Note was made of the trabeculectomy technique adopted. Trabeculectomy was classified as successful if the intraocular pressure was maintained below 21 mm Hg without the addition of anti-glaucoma medications. Follow up was variable.

NO. OF PATIENTS WITH GLAUCOMA

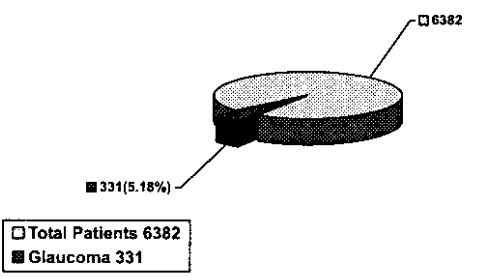

Fig. 1

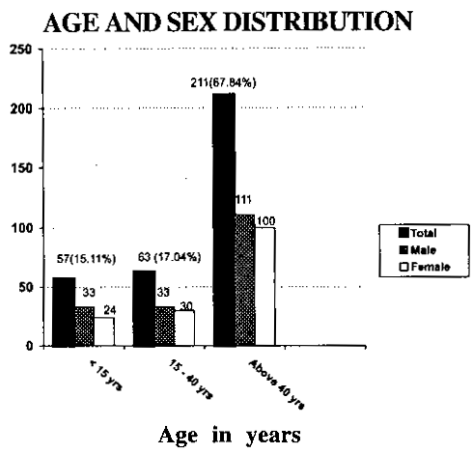

Fig. 2

Results

A total of 6382 patients were admitted to the Khyber Institute of Medical Sciences during two years for various diseases. 415 eyes of 331 patients were affected by glaucoma. This constituted 5.18% of the total number of patients. (Fig-1)

Male patients were 177 while female were 154. The mean age at the time of presentation was 45 years. (Fig–2)

Visual acuity at the time of admission uncorrected and corrected was noted. One hundred and ninety eyes (45.78%) had visual acuity between 6/60 and projection of light, followed by one hundred and ten eyes (27%) between 6/5 to 6/18. Seventy-five eyes (18.07%) had visual acuity of 6/24 to 6/60 and forty eyes (8.15%) did not have perception of light. (Fig–3)

Among the types of glaucoma, the primary glaucoma constituted (63.86%) of the total glaucoma. Secondary glaucomas accounted for the remainder (36.14%).

Primary Glaucoma

Primary angle closure glaucoma was the most common type of primary glaucoma, constituting one hundred and twenty eyes of eighty patients (28.91%). Ninety-three eyes of seventy patients had open angle glaucoma, followed by twelve eyes (2.89%) having absolute glaucoma. Primary congenital glaucomas were responsible for (9.63%) of the total glaucomas, constituting forty eyes of thirty patients. Trabeculectomy with and without mitomycin C was the most common surgical procedure. Laser iridotomy and surgical iridectomy were required less frequently. Some patients with advanced lenticular opacities were offered combined cataract extraction with intraocular lens implantation, while some were treated conservatively and some with cyclocryopexy. (Table-2)

Secondary Glaucoma

Secondary glaucomas were the second most common type of glaucoma requiring admission, constituting about 36.14% of the total glaucoma load.

Amongst the secondary glaucomas, traumatic glaucoma was the most common type, accounting for 7.95% of the total. Majority of such patients had associated

TYPES OF GLAUCOMA

	No. of patients		No. of eyes	
Primary Glaucoma	192	(58.00%)	265	(63.86%)
Secondary Glaucoma	139	(42.00%)	150	(36.14%)
	331	(100.00%)	415	(100.00%)

TABLE – 1

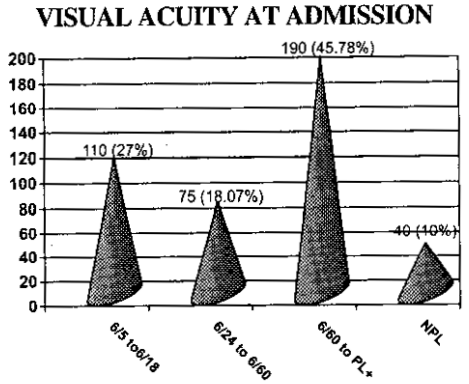

Fig. 2

hyphema and traumatic cataract. Lens induced glaucomas were observed in 7.7% which included both phacolytic 4.1% and phacomorphic glaucomas 3.6%. Steroid induced glaucoma was responsible for (6.03%). All were associated with vernal catarrh with a history of indiscrimate use of topical steroids. Pseudoexfoliation glaucoma was seen in 6.02% of cases. Neovascular glaucomas 5.29% and uveitic glaucoma 2.68% constituted the remaining types of secondary glaucomas. Again trabeculectomy was the most common surgery offered for such patients. Synechiolysis with peripheral iridectomy/pupilloplasty was only done in 2.20% of patients. Extracapsular cataract extraction with and without intraocular lens implantation was required for lens induced and cyclocryopexy for neovascular glaucomas. (Table-3). Trabeculectomy was the most common operation performed for the control of different types of glaucomas. Its success varied from glaucoma to glaucoma, with an overall success rate of 83.70%. (Table-4). Peripheral iridectomy (surgical/laser) was the second most common procedure performed for the control of primary angle closure glaucoma with a success rate of 87.50%.

Synechiolysis with peripheral iridectomy was done for pupillary block glaucoma following aphakia, pseudophakia and chronic anterior uveitis.

Cyclocryopexy was indicated for absolute and advanced neovascular glaucoma. It was successful in controlling intraocular pressure in 66.66%.

TYPES OF GLAUCOMA AND MANAGEMENT

(A) Primary Glaucomas

Type of glaucoma	No. of Patients	No. of Eyes	Treatment
1. **Angle closure glaucoma**	80	120 (28.91%)	Trab (88) Laser PI (20) Surgical PI (12)
2. **Open angle glaucoma**	70	93 (22.40%)	Trab (73) Trab with MMC (10) Comb. Ext. with IOL (04) Conservative (06)
3. **Absolute glaucoma**	12	12 (2.89%)	Conservative (10) Cyclocryopexy (02)
4. **Congenital glaucoma**	30	40 (9.63%)	Trebeculectomy with MMC (27) Trabeculectomy (13)

TABLE – 2

TYPES OF GLAUCOMA AND MANAGEMENT

(B) Secondary Glaucomas

Types of glaucoma	No. of Patients	No. of Eyes	Treatment
1. **Traumatic glaucoma**	33	33 (7.95%)	Conservative (16) Paracentesis (05) Trabeculectomy (04) ECCE with PC IOL (08)
2. **Lens induces glaucoma**			
a) Phacolytic	17	17 (4.1%)	ECCE (6) ECCE with PC IOL (11)
b) Phacomorphic	15	15 (3.6%)	ECCE (14) ICCE with PI (01)
3. **Steroid induced**	20	26 (6.03%)	Trabeculectomy (20) Trabeculectomy with releasable sutures (06)
4. **Peudoexfoliation**	20	25 (6.02%)	Trabeculectomy with releasable sutures (15) Comb.Ext. with IOL (10)
5. **Neovascular glaucomas**			
a) Associated with DM	12	10 (2.40%)	Cyclocryopexy (10)
b) Associated with CRVO	10	12 (2.89%)	Cyclocryopexy (12)
6. **Uveitis related**			
a) Aphakia with Pupillary block	9	9 (2.16%)	Synechiolysis with PI/Pupilloplasty (09)
b) PC IOL with Pupillary block	2	1 (0.04%)	Synechiolysis with PI/Pupilloplasty (09)
c) Ch. Ant. Uveitis with P.S.	1	2 (0.48%)	Conservative (02)

TABLE – 3

Cataract extraction was required for phacogenic glaucoma with success rate of 91%. Paracentesis was required in traumatic hyphema with uncontrolled glaucoma. (Table–5). Shallow to flat anterior chamber was the most common complication following trabeculectomy. It occurred in 22.96%. It was followed by hyphema (11.48%), and Choroidal detachment (5.55%). Post-operative endophthalmitis was seen in 0.74%. (Table–6). Hyphema was the most common complication following peripheral iridectomy. It was followed by anterior uveitis occurring following synechiolysis with peripheral iridectomy, extracapsular cataract extraction, extracapsular cataract extraction with posterior chamber intra-ocular lens implantation and cyclocryopexy. (Table–7)

Discussion

Glaucoma is a common cause of irreversible blindness. According to World Health Organization, it is the third leading cause of blindness in the world, after cataract.[1] The prevalence of blindness in Pakistan is 1.78% (2.5 million) based on the National Health

IOP CONTROL FOLLOWING TRABECULECTOMY (270)

Types of glaucoma	No. of eyes	Successful
1. PACG	88	76 (86.36%)
2. POAG	87	79 (90.80%)
3. Primary congenital glaucoma	40	27 (62.50%)
4. Steroid induced glaucoma	26	21 (80.76%)
5. Pseudo-exfoliative glaucoma	25	20 (80.00%)
6. Angle recession glaucoma	4	3 (75.00%)
	270	226 (83.70%)

TABLE – 4

Survey of Pakistan (1987 – 88). Glaucoma is the fourth common cause of blindness nationally and is responsible for 3.9% of the total blind in Pakistan, an estimated 82,677 cases.[2]

The incidence and prevalence of glaucoma in Pakistan is similar to that of dark–coloured people in developing countries. Pakistan is inhabited by a large number of races, so not only racial mixtures of all societies are seen, but features of a number of groups such as Caucasians, Africans, Mongol and Chinese populations are also seen in their pure form. The primary open angle glaucoma is the most common followed by primary angle closure, aphakic, secondary and congenital glaucoma in Pakistan.[3]

However in our study primary angle closure glaucoma was the leading cause of hospital admission in 28.91% followed by primary open angle glaucoma in 22.40%. One possible reason for this can be that our people usually present when the disease causes loss of vision and or severe pain. Moreover we have a large population with hyperopes and shallow anterior chambers. It is a well-known fact that angle closure glaucoma is more common in Asians. These findings compare well with the report issued by O' Brien who pointed out that the prevalence of primary angle closure glaucoma, the predominant form of glaucoma in Asian countries, is race dependent, being lowest in Caucasians and highest in Inuit.[4]

Developmental glaucoma may be primary congenital glaucoma or glaucoma associated with other ocular developmental abnormalities. In our study it accounted for 9.63%. However, in literature it constitutes about 5.7% to 10.9% of the total glaucoma[6and12].

Information on secondary glaucomas is generally limited. The causes leading to glaucoma are seldom identified. In our study, secondary glaucomas constituted 36.14% of the total glaucomas. Few studies have described secondary glaucomas as a separate entity. Quigley estimated that 6 million people in the world have secondary glaucoma as compared to 67 million who suffer from primary glaucomas.[1] In India, however it represents about 6% of the total new cases of glaucoma seen annually.[5] In some studies,

IOP CONTROL FOLLOWING OTHER OPERATIVE/LASER PROCEDURES

Types of surgery	No. of eyes	Successful
a) Peripheral iridectomy	32	28 (87.50%)
b) Cyclocryopexy	24	16 (66.66%)
c) ECCE	20	17 (85.00%)
d) ECCE with PC IOL	19	17 (89.47%)
e) Synechiolysis Pupilloplasty	10	10 (100.00%)
f) Paracentesis	5	5 (100.00%)
g) ICCE with PI	1	1 (100.00%)

TABLE – 5

COMPLICATIONS FOLLOWING TRABECULECTOMY (270)

Complication	No. of Eyes	
1) Shallow to flat AC	62	(22.96%)
2) Hyphema	31	(11.48%)
3) Choroidal detachment	15	(5.55%)
4) Anterior Uveitis	10	(3.70%)
5) Malignant glaucoma	4	(1.48%)
6) Postoperative endophthalmitis	2	(0.74%)
7) Blebitis	1	(0.37%)
8) Striate Keratitis	1	(0.37%)

TABLE – 6

the secondary glaucomas account for 11.8% to 25% of all glaucomas.[6,7] The causes of secondary glaucoma are mainly four fold: neovascular, uveitic, lens-induced and traumatic. Trauma, cataract and infectious uveitis represent special risks for developing secondary glaucoma, which is a fairly frequent cause of blindness in the third-world countries.[7] In Pakistan the late presentation of cataract patients, the poor management of diabetes, and other diseases leading to neovascular glaucoma, poor management of chronic uveitis and indiscriminate use of topical steroids, especially in ocular surface allergies, is the possible causes of high prevalence of secondary glaucomas.[5]

Improvement in socio-economic situation of the country, better awareness, better management of certain chronic diseases and responsible use of steroids are some of the measures, which can improve this situation.

Standard trabeculectomy technique was performed on 270 eyes out of total of 415 (65%) admitted for the control of glaucomas of various types. Thus it was the most common surgery offered.

This operation was first introduced by Cairns[8] and later modified by Watson.[9] It probably works by means of a fistula formation from the anterior chamber to subconjunctival space.[10] The success rate of trabeculectomy without the addition of anti-glaucoma medication in our series is 83.70%. In primary angle closure glaucoma trabeculectomy was successful in controlling intraocular pressure in 86.36% while in primary open angle glaucoma the success was 90.80%. The success for steroid induced glaucoma was (80.76%), while for pseudo-exfoliative glaucoma it was (80.00%).

These results can be compared well with those reported by Ridgway[11] and Alemu[12] who reported a success rate of 77% to 79% without anti-glaucoma drugs in 1974 and 1997 respectively. A success rate of 85%, 82% and 71% at the 1, 2 and 5-year postoperative intervals respectively is also given by Anand et al in 2001.[13] Similarly 84% success rate is reported by Edmunds.[14]

COMPLICATIONS FOLLOWING OTHER PROCEDURES/LASER

Procedure/Laser	Total eyes treated	Eyes with complications
a) **Peripheral Iridectomy**	32	
(i) Hyphema		6 (18.75%)
b) **Cyclocryopexy**	24	
(i) Anterior uveitis		4 (16.66%)
c) **ECCE**	20	
(i) Anterior Uveitis		1 (10.00%)
(ii) Vitreous Loss		5 (25.00%)
(iii) Expulsive hemorrhage		1 (5.00%)
d) **ECCE with PC IOL**	19	
(i) Anterior Uveitis		3 (15.78%)
(ii) Iridodialysis		1 (5.26%)
(iii) Hyphema		1 (5.26%)
e) **Synechiolysis with PI**	10	
(i) Anterior Uveitis		1 (10.00%)

TABLE – 7

Other Laser/Surgical procedures

Intraocular pressure control following laser/surgical procedures for the control of secondary glaucomas varied from 66.66% (Cyclocryopexy for advance neovascular glaucoma) to 91% (cataract extraction for phacolytic and phacomorphic glaucoma).

Paracentesis was required for traumatic hyphema with a success rate of 100%. Peripheral iridectomy (surgical/laser) was done for primary angle closure glaucoma resulting in control of intraocular pressure in 87.50% cases. In uveitic glaucoma, whether secondary to aphakia, pseudophakia or chronic anterior uveitis, synechiolysis or pupilloplasty with peripheral iridectomy was performed with 100% success rate. Some cases with pseudo-exfoliative glaucoma with advanced lenticular opacities underwent combined cataract extraction with intraocular lens implantation.

Complications following surgery/ laser

1) Following trabeculectomy

Shallow to flat anterior chamber is a common complication following partial thickness trabeculectomy. It occurs where the outflow of aqueous through the sclerostomy exceeds aqueous production. In our study, the incidence of shallow anterior chamber was 22.96%. Wound leak and or excessive filteration were the main causes. Choroidal detachment was seen in 5.55%. Slightly lower incidence of shallow (11.6%) and flat (4.5%) anterior chamber has been reported by Mc Pherson, Cline and Mc Curdy,[15] while Edmunds[16] and Alemu[12] reported incidence of shallow anterior chamber between 23.9% and 29% in their studies.

In our study the incidence of postoperative hyphema was 11.46% which occurred at the time of surgery in the majority of patients. Secondary hyphema was not reported and intraocular pressure remained normal in all patients. This can be compared with the hyphema incidence of 5.9% noted by Ridgway[11] and 24.6% as observed by Edmunds.[16]

The incidence of anterior uveitis following trabeculectomy has been reported as 17%.[12] In our study it was 3.70%. It responded well to topical steroids and cycloplegics.

We observed malignant glaucoma in 1.48%. It was successfully managed with conservative measures and did not require any surgical intervention.

We saw postoperative endophthalmitis in 0.74% of our cases. One eye was saved by intensive topical and intra-vitreal antibiotics while two eyes were lost. The current reported incidence of bleb-associated endophthalmitis is 1%.[17] Bacteria enter the eye through either intact or leaking conjunctival filtering blebs. Blebitis (0.37%) and striate keratitis (0.37%) were the other complications observed following trabeculectomy performed for various types of glaucomas.

(II) Following other surgical/laser procedures

Anterior uveitis was the most common complication noted (incidence between 10.00% to 16.66%) following pupilloplasty, cataract extraction and cyclocryopexy performed for secondary glaucomas.

Others complications noted were hyphema (following peripheral iridectomy and extracapsular cataract extraction with posterior chamber intraocular lens implantation), and vitreous loss, expulsive hemorrhage and iridodialysis (following extracapsular cataract extraction with and without intraocular lens implantation for lens induced glaucoma). (Table – 7)

Conclusions

Primary glaucoma is the most common type of glaucoma requiring admission in our setup. Among the admitted cases of primary glaucomas, angle closure glaucoma is more common than open angle glaucoma in this part of the world. Secondary glaucomas are important in our setup. Trabeculectomy seems to be a relatively safe and effective procedure for most glaucomas with acceptable rates of complications.

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