TYPES AND PRESENTATION OF GLAUCOMA

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ABSTRACT

Objective: *The objectives of the study were to determine the age and sex distribution as well as types of glaucoma in hospitalized children and adults.*

Material and Methods: *The study was conducted at Khyber Institute of Ophthalmic Medical Sciences, Hayatabad Medical Complex, Peshawar, from January 01, 2005 to June; 30th 2006.The study was approved by the ethical committee of KIOMS. We had a total of 300 admitted patients (100 children and 200 adults) diagnosed with glaucoma, out of these patients,100 patients were included in the pediatric group and 200 in the adult group (17 years and above). This was a prospective hospital based descriptive study.*

A comprehensive performa was designed incorporating detailed history and a thorough ocular examination. Humphrey visual field analyzer was used for doing visual fields.

In children, examination under anesthesia (EUA) was carried out. There was no follow-up.

Statistical package for Social Sciences (SPSS) was used, for data analysis.

Results: *There were more males in the pediatric group (64% versus 36% females). Secondary glaucoma (60%) was more common than primary glaucoma (40%). Steroid induced glaucoma was the commonest glaucoma (17%) followed by hyphaema (14%), and uveitic glaucoma (13%),*

There were more males in the adult group (56.5% versus 43.5% females). In adults, primary glaucoma was the commonest glaucoma (56.5%) as compared to secondary glaucoma (43.5%). Primary open angle glaucoma constituted 35% followed by primary angle closure glaucoma (21.5%). In the secondary glaucoma, secondary angle closure glaucoma was the commonest (24.5%), followed by secondary open angle glaucoma (19%).

Conclusion: *In hospitalized patients, glaucoma was more common in males in both groups. Secondary glaucoma was more common in children whereas primary glaucoma was more common in adults.*

Key Words: *Glaucoma, Primary, Secondary, Congenital.*

INTRODUCTION

Glaucoma, a specific form of optic neuropathy, causing irreversible blindness, is the third most common cause of blindness in the world. Quigley and Broman have estimated that glaucoma will afflict 60.5 million people in the year 2010.[1] The prevalence of blindness in Pakistan is 2.7% (1,140,000 blind adults) based on National Health Survey of 2003.[2] Glaucoma was found to be the fourth most common cause of blindness in Pakistan.[3]

In Pakistan, primary open angle glaucoma (POAG) is the most common type followed by primary angle closure, aphakic, secondary and congenital glaucoma.[4] In one study primary angle closure glaucoma was leading cause of hospital admissions.[5] POAG is the predominant form of glaucoma in Asian and Western countries.[1&6] Quigley and Broman have estimated that 60.5 million people in the world will have Open angle glaucoma and Angle closure glaucoma (ACG) by 2010.[1] The causes of Secondary glaucoma are mainly four folds : Neovascular (NVG), uveitic,(UG) lens induced (LIG) and traumatic. Trauma, cataract and infectious uveitis represent special risks for developing Secondary glaucoma, which is a frequent cause of blindness in the third world countries.[6,7,8,&9] 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 steroids, especially in ocular surface allergies, are the possible causes of high prevalence of secondary glaucoma.[7,8,9,10,11,&12.]

Prevalence of glaucoma in any given population needs to be mentioned and compared. In Pakistan, few data are available regarding age and gender distribution as well as various types of glaucoma in hospitalized patients. Therefore the aim of this study was to determine the different types as well as age and gender distribution of various types of glaucoma presenting to Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad Medical Complex, Peshawar.

MATERIAL AND METHODS

This prospective and hospital based descriptive study was conducted at Khyber Institute of Medical Sciences, Hayatabad Medical Complex, Peshawar after getting approval from the Research and Ethical Committee of Khyber Institute of Ophthalmic Medical Sciences. The study started on January 01, 2005 and finished on 30th June, 2006. Three hundred admitted patients diagnosed as having glaucoma on the basis of visual field loss, optic neuropathy and raised IOP, were included in this study. Out of these patients, 100 patients were included in the pediatric group and 200 in the adult group (17 years and above).

Patients were selected through non probability, convenient sampling technique. All the patients or their parents (in case of very small children) signed an informed consent form. Those patients who did not gave consent to be included in this study were excluded from the study. A performa was designed and completed for all the patients. After admission of the patient, his/ her name, admission number, age, sex, address, occupation and date of admission were noted. Then a detailed history about the visual complaints, pain, redness, haloes, alteration of vision and loss of vision along with blepharospasm and increased size of the eyeball was taken. Past ophthalmic history, which included history about Glaucoma medications, steroids use, previous ocular trauma , surgery and laser treatment was enquired. Family history of glaucoma was also taken. Past medical history, and medication history about steroids and drops use as well as anticholinergic / tricyclic antidepressants, systemic beta blockers / calcium channel blockers was enquired.

A thorough Ocular examination was carried out including visual acuity check up, added and unaided, pupillary reaction examination, and anterior and posterior segment examination for each eye. Pupils were checked to see the presence of relative afferent pupillary defect (RAPD) and corectopia. Conjunctiva was examined for the

AGE AND GENDER DISTRIBUTION OF ADULT PATIENTS

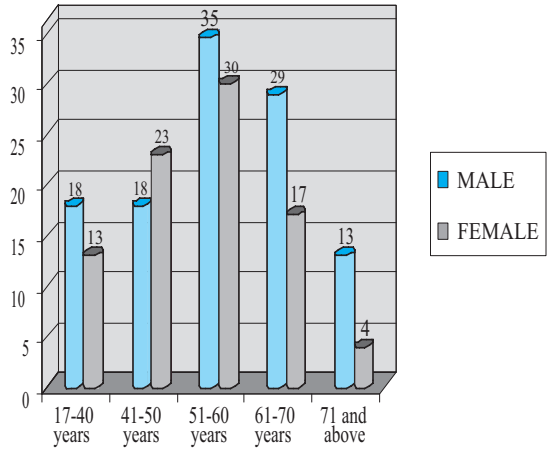

FIGURE- 1

vasodilatation, signs of previous surgery or papillary or follicular conjunctivitis and deposition of drugs (adrenochrome). Cornea was examined for any enlargement; punctuate epithelial defects, corneal edema, exfoliative material, anteriorly displaced schwalbe's line, traumatic and surgical scars. Anterior chamber depth was measured. Iris was examined for heterochromia, iris atrophy, transillunmination defects, pseudo exfoliation material, rubeosis, sphincter tears and synechiae. Lens was examined for pseudo exfoliation material, cataract, phacodonesis, glaukomflecken, lens subluxation and dislocation and intraocular lens (IOL) presence. Fundus was examined for hemorrhages, retinal vascular occlusion, Diabetic retinopathy and Retinal detachment. Optic disc was looked for its size, neuroretinal rim, cup disc ratio (CDR),splinter hemorrhages, peripapillary atrophy and nerve fibre layer defects. Direct and indirect ophthalmoscopes were used to examine the posterior segment. Slit lamp biomicroscopy with 78 D or 90 D lens or Goldmann three mirror was also done to look for glaucomatous changes.

Intraocular pressure of the patients was measured with Goldmann tonometer . Goldmann three mirror / single mirror was used to do gonioscopy of adult patients and Shaffer grading was used for the width of the angle and recorded. Additional pathology like new vessels in angle, pigment or peripheral anterior synechiae was also noted.

Visual fields were done and the type of damage was noted. Humphrey visual field analyzer was used for doing visual fields.

In children, examination under anesthesia (EUA) was carried out. Corneal diameters in vertical and horizontal directions were measured. Intraocular pressure was measured with Perkins

hand held tonometer and fundus was examined with direct ophthalmoscope.

Some patients had bullous keratopathy in whom gonioscopy was not possible. Also during the acute stage of Angle Closure Glaucoma, gonioscopy was delayed till the clearing of the cornea.

Visual fields were not performed in patients who were too old or mentally weak and could not follow commands. There was no follow up of patients in this study.

Statistical package for Social Sciences (SPSS) was used, for data analysis. Frequency counts were calculated for males and females in both adult and children groups for age and gender and for primary open angle glaucoma, primary angle closure glaucoma, secondary open angle glaucoma and secondary angle closure glaucoma in adults and primary and secondary glaucoma in children. Frequency counts and Chi- Square test were used for data analysis and statistical significance. Then the level of statistical significance between males and females was calculated through Chi-square test, at a significance level of 0.05.

RESULTS

Of 300 patients included in this study, 100 patients were pediatric (up to 16 years) and the remaining 200 were adults. Minimum age was 16 days and maximum was 99 years.

The frequency of pediatric male and female patients (up to 16 years) was 64% males and 36% females. The frequency of adult male and female patients was 56.5% males and 43.5% females. Glaucoma was most prevalent (32.5% cases) in the 5th to 6th decade and followed by 23% cases in the 6th to 7th decade. (Fig 1) The number of eyes affected by glaucoma in both adults and children was 148 eyes were affected in children and 284 eyes in adults.

Sixty percent (60%) children suffered from Secondary glaucoma, steroid induced glaucoma was the commonest secondary glaucoma in 17% pediatric patients (12% males and 5% females). Traumatic glaucoma was seen in 15% children and uveitic glaucoma in 13% children followed by glaucoma due to ectopia lentis (8%) developmental glaucoma, (4%) and glaucoma secondary to subluxated intraocular lens (IOL) in 3% patients. (Table I).

Forty percent (40%) children suffered from primary glaucoma. Congenital /infantile glaucoma in 30% patients and juvenile glaucoma, in 10% cases (Table II). Thirty five percent (35%) adult patients suffered from Primary open angle glaucoma (POAG) (Table III).

Twenty one and a half percent (21.5%)

SECONDARY GLAUCOMAS IN PAEDIATRIC PATIENTS (n= 60)

	MALES (%)	FEMALES (%)
Steroid induced glaucoma	12 (20%)	5 (8.33%)
Traumatic glaucoma		
a. Hyphema	7 (11.66%)	7 (11.66%)
b. Angle recession glaucoma	1 (1.66%)	0
Inflammatory / uveitic glaucoma	9 (15)	4 (6.66%)
Developmental glaucoma		
a. Anterior segment dysgenesis	2 (3.33%)	0
b. Peter's anomaly	1 (1.66%)	0
c. Sturge Weber Syndrome	1 (1.66%)	0
Glaucoma due to Ectopia lentis		
a. Marfan Syndrome	3 (5%)	3 (5%)
b. Homocystinuria	0	1 (1.66%)
c. Trauma	1 (1.66%)	0
Glaucoma due to Subluxated IOL	1 (1.66%)	2 (3.33%)
Total	38	22
X2 Test	X2 cal (8.475)	X2 tab (15.51)*
p- value	0.296 >	0.05*

*Difference not significant

Table 1

PRIMARY GLAUCOMAS IN PAEDIATRIC PATIENTS (n= 40)

	MALES (%)	FEMALES (%)
Primary Congenital Glaucoma / Infantile Glaucoma	19 (73.07%)	11 (78.57%)
Juvenile Glaucoma	7 (26.92%)	3 (21.42%)
Total	26	14
X^2 Test	X 2cal (0.147)	X tab (2.53) *
p-value	0.702 >	0.05 *

*Difference not significant

Table 2

adult patients suffered from Primary angle closure glaucoma (PACG), 7.5% patients had post congestive angle closure glaucoma, 7% had acute angle closure glaucoma, 6% had chronic angle closure glaucoma while1% patients suffered from absolute glaucoma.(Table IV).

Twenty four and a half percent (24.5%) adults suffered from Secondary angle closure glaucoma, neovascular glaucoma with closed angles was seen in 7% cases, lens induced glaucoma (LIG) in 6.5% and uveitic glaucoma with closed angles in 2% patients. (Table V)

Nineteen percent (19%) adult patients suffered from Secondary open angle glaucoma, pseudo exfoliation in 11% patients, uveitic glaucoma with open angles in 2.5% cases and , neovascular glaucoma in 2.5% patients and steroid induced glaucoma in 1.5% (Table VI.)

Statistical tests are applied on primary and secondary glaucomas in both pediatric and adult groups as shown in all the tables

DISCUSSION

Glaucoma is the second most common global disease which causes irreversible loss of vision.[1] It is not only a problem for the affected person but also for the society especially in countries like ours where social and welfare services are not fully developed and functional. In Pakistan, it is the fourth commonest cause of blindness.[3] Various studies have been carried out in our country on different aspects of this disease but so far there are few studies available which have investigated the age and sex distribution of various types of glaucoma in hospitalized patients. This study was carried out to bridge the gap on this aspect of glaucoma in Pakistan.

In this study, there were more males in the paediatric group (64%) as compared to 36% females. Childhood glaucoma affects males predominantly (65%).[13&14]

Sixty percent (60%) patients in the paediatric group had secondary glaucoma. This observation is slightly different from that of Babar whose percentage of secondary glaucoma was 36.14%. They had more patients than this study.[5] and they took both adults and children as one group. In the year 2000, in India, secondary glaucoma was seen in 6% patients in a tertiary care institute.[7] This difference is due to the fact that India has a huge population and similarly a large number of primary glaucoma patients. Secondary glaucoma was found to be 21.84% in another study from India. Most patients were adults and they were referred to this Institute as a result of complicated cataract surgery.[15] Secondary glaucoma was seen in only 1.6% patients by Meetheetraitut.[16] They had less number of patients (128). Thailand is situated in South – East Asia and Thai people are of different race, culture and social behaviors. They are economically stronger than us and their health services are better than us. Secondary glaucoma was seen in 21.49% ocular emergencies (admitted) patients by Jan .[17] They had only studied ocular emergencies and no patients with primary glaucoma. Foster et al observed secondary glaucoma in 16% patients.[18] Rao observed secondary glaucoma in 35% patients.[19] in the adult's group secondary glaucoma was observed in 43.5% patients. In a study conducted by Seah, the percentages of secondary glaucoma was 15%.[20]

In our study, Steroid induced glaucoma (SIG) was the commonest secondary glaucoma observed in 17 (17%) paediatric patients (12% males and 5% female).and in 1.5% adult patients. This is not consistent with that of Babar who showed that this glaucoma was present in 6% patients[5]. They had a larger group of patients and no pediatric group. There is prevalence of quackery which has promoted the injudicious use of steroids and self medication for spring catarrh and allergic conjunctivitis. Krishnadas showed that Steroid induced glaucoma is present in 0.20% patients.[7] The big difference between this study and Krishnadas is the large number of patients in

PRIMARY OPEN ANGLE GLAUCOMA IN ADULTS (n = 70)

Type of Glaucoma	No of patients n	Males n (%)	Females n (%)
Primary Open Angle Glaucoma (POAG)	66	37 (52.8%)	29 (41.4%)
Normal Tension Glaucoma (NTG)	4	4 (5.71%)	0
Total	70	41	29
X2 Test		X2 cal (4.009)	X2 tab (3.84)*
p-value		0.966 >	0.05*

*Difference not significant

Table 3

their study. The other reason is that health system in India is better than Pakistan and the literacy rate is very high. Steroid induced glaucoma was found in 0.6% cases in the study of Kaimbo Wa Kaimbo [21] Like Babar, they had not divided patients into adult and paediatric groups. They had single group composed of all age patients. Moreover, Congo is a poor country and might be deficient in pharmaceutical industry and hence steroids and its injudicious use.

In our study, uveitic glaucoma (UG) was seen in 13% pediatric patients and 4.5% adult patients. 2.5% had uveitic glaucoma with open angles and 2% had uveitic glaucoma with closed angles. Babar observed uveitic glaucoma in 2.7% patients[5]. They had only 12 patients suffering from uveitic glaucoma including children while in this study, the number of adult patients with uveitic glaucoma is nine excluding children. Kaimbo Wa Kaimbo observed uveitic glaucoma in 6% patients.[21] Krishnadas stated that uveitic glaucoma constituted 0.4% of the Glaucomas.[7] They had a lot of patients suffering from primary glaucoma so the number of patients with uveitic glaucoma was very less. According to Forrester the incidence of glaucoma after acute uveitis was 7.6 % and in chronic uveitis, it was 6.5% and 11.1%.[22]

In our study, glaucoma secondary to trauma occurred in 15 % cases. There were 14% cases of traumatic hyphaema / red cell glaucoma, and in 1% Angle recession glaucoma was present. None of the studies is consistent with our study. According to Babar, traumatic glaucoma was seen in 7.95% patients.[5] They had included all age patient while our finding was only in adult patients. According to Krishnadas, traumatic glaucoma constituted 0.26% of all glaucomas.[7] Traumatic glaucoma was found in 2.2% of patients of Kaimbo Wa Kaimbo[21] They had surveyed the glaucoma in all patients without distributing them in adult and children groups. Ammar and colleagues found angle recession in 11 out of 13 post traumatic glaucoma patients.[23]

In this study, glaucoma secondary to Ectopia lentis was seen in 8% patients. Only 1% patients suffered from Homocystinuria and 1% from trauma which caused dislocation of natural crystalline lens into the anterior chamber while Marfan syndrome caused glaucoma in 6% children. Kim SY and colleagues were of the opinion that 14 % of the Ectopia lentis caused uncontrolled glaucoma which needed surgical intervention.[24] Similarly, Khan showed that 25% glaucoma was caused by ectopia lentis in Marfan Syndrome.[25] They had a large case series of ectopia lentis and Marfan syndrome in both these studies.

There were 4% patients of developmental glaucoma. 1% patient each of Peter's anomaly and Sturge – Weber syndrome and 2% patients of anterior segment dysgenesis had glaucoma.

Glaucoma caused by subluxated / dislocated Intraocular lenses (IOLs) was present in 3% children and 1.5% adults. Keech and associates found 11% incidence of glaucoma after lensectomy and vitrectomy.[26] In our study, all the patients were older than 6 years of age while they had carried out cataract surgery for congenital cataract. Lawrence et al study is not consistent with our study.[27] Their 42% patients had primary IOL implantation. Their 11% patients developed glaucoma. In our study, dislocated Intraocular lens (IOL) caused secondary glaucoma in 1.5% adults. It was seen in 0.62% cases by Krishnadas et al.[7] In a study conducted in Chennai, Arvind et al found glaucoma in 11.2% (54) aphakics/pseudophakics.[28] They had a large number of patients with glaucoma secondary to aphakia/ pseudophakia.

We observed 30% cases of primary congenital (PCG) / infantile glaucoma. Juvenile glaucoma was present in 10% cases. Babar observed PCG in 9.63% patients[5] This difference is due to the availability of two paediatric ophthalmologists in our unit and we get a large

PRIMARY ANGLE CLOSURE GLAUCOMA (ACG) IN ADULTS (n= 43)

TYPE OF GLAUCOMA	MALE n (%)	FEMALE n (%)
Post congestive ACG	4(9.3)	11(25.5)
Acute ACG	5(11.6)	9 (20.9)
Chronic ACG	7(16.2)	5(11.6)
Absolute glaucoma	1(2.32)	1(2.32)
X2 Test	X cal (2.99)	X tab (7.82)*
p-value	0.427 >	0.05*

*Difference not significant
Table 4

number of referred patients. Kaimbo Wa Kaimbo observed PCG in 1.7% cases.[21]. This can again be due to lack of pediatric ophthalmology services. Jan found congenital glaucoma in 3.4% of the ocular emergency patients.[17]

In the adult group, there were 15.5% patients in the age group from 17 years to 40 years. There were 9% males as compared to 6.5% females. From 41 – 50 years, there were 20.5% patients, males constituting 9% and females 11.5% population. Between 51 -60 years, there were 32.5% patients in this age period. Males were 17.5% and females were 15%. In the patients between 61- 70 years, there were 23% patients. Males were 14.5% wile females were 8.5%. There were 8.5% patients of 71 years and above. Males were 6.5% and females were 2%. Glaucoma is common in old age.[15&16]

64% of my patients were above 50 years.

Similarly, there were more males (56.5%) in the adults group as compared to 43.5% females. This observation is supported by study conducted by Babar in which there were 53% male patients versus 46.5% females.[5] Similarly Khu has also revealed male predominance (57.7%) for POAG while for CACG, there was female preponderance (58.3%).[29] Females outnumbered males in the study conducted by Metheetraitut.[16]

Primary glaucoma was seen in 56.5 % of the patients in the adult group. This is consistent with the study of Babar in which primary glaucoma was more common than secondary glaucoma but in that study primary glaucoma constituted 63.9% of the total glaucomas.[5] One reason for this difference is the number of patients which in that study was 331 as compared to my study (300 patients). The other reason is that they had not divided the patients into adult and paediatric groups. They had considered all the patients as a single group.

Thirty five percent (35%) patients had Primary open angle glaucoma (POAG), which is the commonest type of glaucoma. The frequency of POAG ranges from 37% to 72.2% in different studies.[15, 16, 19 & 20]

Metheetraitut observed POAG in 47.7% patients.[16] All her patients were older than 60 years and she had a total number of 128 patients. Babar observed POAG in 22.4% patients.[5] The reason for this difference could be the poverty, illiteracy and painless nature of POAG. Our study is consistent with that conducted by Rao whose study revealed that POAG was the commonest type making a 37% share of the glaucoma.[19] Herndon et al observed POAG in 44.2% patients. That study was conducted in an eye clinic in Ghana, which is a poor country than ours and that clinic might be deficient in modern equipments which are present in our unit.[30] Bourne et al observed POAG in 67% of the cases.[31] Reasons for this high percentage could be the less number of patients (27 glaucoma patients) in Rom Klao district in Thailand.

But in their study POAG was the commonest type. POAG is present in 75% of patients in Bangladesh.[32.] They examined 2347 patients and all were above 35 years old. Seah revealed that POAG was present in 49% patients but 67.7% patients were older than 60 years and only 45 diagnosed glaucoma were enrolled in that study.[20] According to Kaimbo Wa Kaimbo POAG was present in 72.2% patient in their study.[21] The

SECONDARY ANGLE CLOSURE GLAUCOMA IN ADULTS (n = 49)

TYPE OF GLAUCOMA	MALE n (%)	FEMALE n (%)
NVG	5 (10.2)	9(18.3)
(Neovascular glaucoma)	5 (10.2)	8 (16.3)
LIG	4 (8.1)	2 (4.08)
(Lens induced glaucoma)	4 (8.1)	0
Traumatic dislocated lens	2 (4.08)	1(2.04)
UG	2 (4.08)	1 (2.04)
(Uveitic glaucoma)	3 (6.1)	0
Pseudophakia (PPK)	0	0
Traumatic glaucoma	26	1(2.04)
Malignant glaucoma	X2 cal (13.034)	23
Tumours	0.08	X2 tab (16.92)*
Post lasers glaucoma		>
TOTAL		0.05*
X 2 Tes		
p-value		

*Difference not significant
Table 5

SECONDARY OPEN ANGLE GLAUCOMA IN ADULT PATIENTSN=38

	MALE	FEMALES
Pseudoexfoliation glaucoma (PXF)	18 (47.3%)	4 (10.5%)
Uveitic glaucoma (UG)	4 (10.5%)	1(2.63%)
Neovascular glaucoma (NVG)	3 (7.89%)	2 (5.263%)
Steroid induced glaucoma (SIG)	1 (2.63%)	2 (5.263%)
Angle recession glaucoma (ARG)	3(7.89%)	0
X^2 Test	X^2 cal (5.140)	X^2 tab (2.306) *
p-value	0.274 >	0.05 *

*Difference not significant

Table 6

reasons which contradict my study could be the black race of African patients and long heights which predispose them to POAG. Jan et al observed POAG in 57.67% of ocular emergencies patients.[17]

Twenty one and a half percent (21.5%) patients suffered from Primary angle closure glaucoma (PACG). Babar observed PACG in 28.9% patients.[5] In their study PACG was the leading cause of hospital admission. Similarly, Seah observed PACG in 31% patients[20]. Meetheeetraitut observed PACG in 41.4% patients.[16] Jan found closed angles in 17.3% of ocular emergency patients.[17] Rao observed PACG in 18.2% patients.[19] We observed Acute PACG in 7% patients (2.5% males and 4.5%). Acute ACG and post congestive ACG was more in females. Our study is consistent with that of Herndon et al who observed 6.6% people afflicted with Chronic ACG.[30] Khu observed only 62 patients suffering from Chronic ACG and of these patients 58.3% were females.[29]

In our study, Pseudo exfoliation glaucoma (PEXG) was seen in 11% patients (9% males and 2% females). Babar was of the opinion that PEXG was present in 6% cases.[5] this is inconsistent with our study. Kaimbo Wa Kaimbo found Pseudo exfoliative glaucoma in 3% patients.[21] The reason for this vast difference in these two studies is due to the fact that PEXG is prevalent in Sudan, Somalia, Ethiopia and Tanzania while it is rare in West Africa.

Neovascular glaucoma (NVG) with open angles was present in 2.5% patients while with closed angles; it was present in 7% patients. Babar support our study by stating that NVG was present in 5.3% patients.[5] Krishnadas observed NVG in 0.95%.[7] The study of Kaimbo Wa Kaimbo refutes our observation by stating that NVG was present in 1.3% patients.[21] Congo is a poor country and the number of people afflicted with diabetes and hypertension is very less as compared to our country so they are having very less number of patients with NVG.

Lens induced glaucoma (LIG) was seen in 2.5% adult male and 4% females. The observation made by Babar supports our study that LIG was present in 7.7% of the patients.[5] Krishnadas support my study by observing LIG in 6% patients.[7] Reason for this is lack of education, health care facilities and financial constraints. .

Malignant glaucoma was seen in 1% diabetic patients who had undergone Pars plana vitrectomy (PPV) and in 0.5% patient who had undergone Phacoemulsification with Posterior chamber intraocular lens implantation. Muqit has also observed Malignant glaucoma after Phacoemulsification in an 84 years old female with narrow angles in whom Nd YAG laser iridotomy had been done previously.[33] Powell reported a case of Malignant glaucoma after cataract extraction in a llama.[34]

Malignant melanoma caused Angle closure glaucoma in 1 (0.5%) patient in our study. In the study of Kaimbo Wa Kaimbo Retinoblastoma caused glaucoma in 0.6% patients.[21] This tumor was in children, not in adult patients. Choroidal melanoma caused Angle closure glaucoma in two cases in a study.[35] Similarly, Matsui and his colleague presented a case report of metastatic intraocular lymphoma which caused secondary open angle glaucoma.[36] Kase and his colleagues reported a case in which Choroidal melanoma caused Neovascular Glaucoma and Retinal detachment.[37]

CONCLUSION

Glaucoma is more common in males both in the pediatric and adult groups.

SIG was the commonest secondary

glaucoma in children followed by trauma and uveitis.

Primary congenital/ infantile glaucoma was the commonest primary glaucoma followed by juvenile glaucoma. POAG was the commonest type of glaucoma in adults followed by secondary angle closure glaucoma. Lens induced glaucoma was the commonest secondary Angle Closure Glaucoma. Maximum number of adult patients presented between 51 years to 70 years.

RECOMMENDATIONS

Open angle Glaucoma is a painless disease and patients are not aware of visual loss therefore every adult person above 40 years should have an eye examination once a year to exclude glaucoma. Many cases of secondary ACG can be prevented by early detection and treatment e.g. LIG can be avoided by early cataract surgery. Severe pain in PACG compels the patient to consult a doctor. General practitioners should have some knowledge about glaucoma so that they can give emergency treatment in undeveloped areas and then refer the patient to specialized centers. There should be discouragement of self-medication as steroids are commonly used without its need by the ignorant masses.

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