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Original Article

Clinical analysis of glaucoma in hospital patients

Rijal AP
Senior Consultant Ophthalmologist, Nepal Eye Hospital

Abstract
Objectives: (i) To determine the prevalence and pattern of glaucomas presented to Nepal Eye Hospital for strategic planning. (ii) To know the most common attributable factors giving rise to secondary glaucoma. (iii) To know the incidence of Glaucoma blindness. **Materials and methods:** A retrospective hospital based analysis of medical records of patients attending Nepal Eye Hospital Glaucoma clinic over a period of 2 years (Jan 2003 - Jan 2005) was done in order to know the magnitude of the disease and its pattern, for planning purpose to upgrade Glaucoma clinic services in the hospital. **Results:** Glaucoma patients comprised of 0.74% (827) of total outpatients (110794). Male and female ratio was 49.6%:50.4%. Primary Open Angle Glaucoma (POAG) found to be more common (57.3%), followed by secondary glaucoma (20.8%), Primary Angle Closure Glaucoma (PACG) 19.9% and Congenital/Juvenile and miscellaneous (2%). Incidence of Glaucoma blindness (Absolute Glaucoma) found to be 2.17%. Almost equal predelection to sex was seen in all types of glaucomas except PACG, Lens induced Phacomorphic glaucoma and uveitic glaucoma where female outnumbered males. The disease was found to be more common in age group above 40 years.

Keywords: POAG, PACG, Glaucoma, DM, HTN, CRVO, BRVO

Glaucoma is an irreversibly blinding eye disease which damages optic nerve head fibres. The disease may be asymptomatic in certain clinical types, until advanced stage, so much emphasis is to be given for early diagnosis. Other types of glaucoma which produces symptoms also needs timely attention before severe visual impairment occurs.

The 1981 Nepal Blindness Survey estimated that there were 117623 blind people in Nepal[1]. Glaucoma was found to be an important cause accounting for 3.2% after cataract (66.8%) and retinal diseases (3.3%).
The recent data on magnitude and pattern of Glaucoma is not available. However, this hospital based study may reflect the scenario of the disease pattern in our society, indicating that the problem is on rise, particularly of the secondary glaucoma associated with DM, HTN, Inflammation, Cataract and Trauma.

Objectives
The present study was carried out with the following objectives in order to plan for upgrading glaucoma clinic in hospital for early diagnosis and management of the disease with modern facilities.

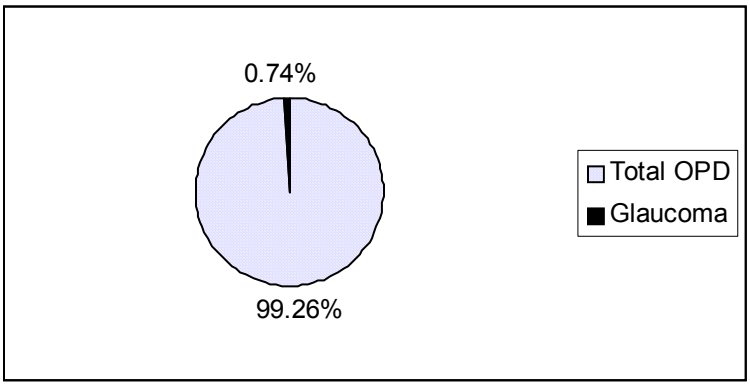
1. To determine the prevalence of glaucoma amongst total hospital attendants.
2. To know the pattern of glaucoma
3. To know the common attributable factors that give rise to secondary glaucoma
4. To know the incidence of glaucoma blindness

Material and methods
It is a 2 years retrospective study done in Nepal Eye Hospital. Medical records of patients referred to Glaucoma clinic from OPD and ward since Jan 2003 to Jan 2005 were analyzed. The examination included routine Glaucoma clinic work up for e.g. visual acuity, slit lamp examination, optic disk evaluation with 90D lens, applanation tonometry, gonioscopy and visual field examination. All cases were grouped into 5 age groups, i.e. 0-10 years, 11-20 years, 21-40 years, 41-60 years and above 60 years. The records were analyzed in respect to age, sex and types of glaucoma, to ascertain the affinity of specific types to specific age group and sex and also to determine the causative factor, that attribute to the development of secondary glaucoma. No of absolute glaucoma cases also determined from the records. Total OPD attendance of 2 years period and no of glaucoma clinic referred cases were recorded to know the incidence of the disease.

Correspondence
Dr. A. P. Rijal,
Nepal Eye Hospital,
Tripureshwor, Kathmandu, Nepal

Results

The prevalence of glaucoma was found to be 0.74% (827) of total out patients (110794) attended in a 2 years period from Jan 2003 to Jan 2005. Male:Female ratio was 49.6%:50.4%. Out of 827 glaucoma cases, 474 cases (57.3%) were found to be POAG, vide Table 1. Male and female ratio was 256:218. This shows that POAG has slightly greater prevalence in males and it is more common in 41-60 years age group in both sexes.



PACG were found to be 19.9% (165), and more common in females than males. Male and female ratio was 39:126. This shows that PACG is more than 3 times more common in females than males in old age group, more so in 41-60 years age.

Congenital/Developmental Glaucoma cases below 10 years age group were 7 in number, 5 male and 2 female children. Amongst juvenile glaucoma, i.e. above 10 years and below 20 years age group, 9 cases were found, 7 being male and 2 female.

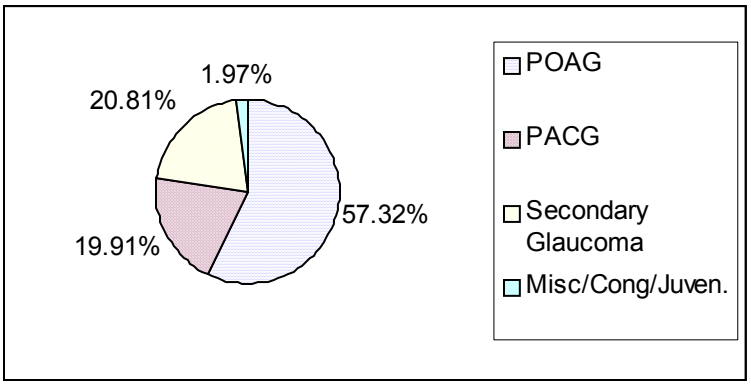
Table 1: Primary Glaucoma

Age	POAG		PACG	
21-40 years	78	64	10	32
41-60 years	105	90	22	78
61 years and above	73	64	7	16
Total	**256**	**218**	**39**	**126**
	474		**165**	

Table 2: Congenital/Developmental/Juvenile Glaucomas

Age group	Sex		Total
	Male	Female	
0-10 years	5	2	7
11-20 years	7	2	9
Total	**12**	**4**	

Secondary Glaucoma cases were 20.8% (n=172). In this group were included Glaucoma associated with Diabetes Mellitus (DM), Hypertension (HTN), Central Retinal Vein Occlusion (CRVO), Pseudo exfoliation (PXF), traumas, inflammation, drugs and lens related Glaucomas. Secondary glaucoma associated with blunt trauma were 20 in no, 18 males and 2 females and were more common above 10 years age.



Secondary glaucoma resulting from perforating eye injuries were 7, 6 males and 1 female, all within 10-40 years age group. Glaucoma associated with ocular inflammation like uveitis were 26, 11 males and 15 females, all above 11 years, more so over 21 years group.

Table 3: Secondary Glaucoma

Age group	Blunt Trauma		Perforating Trauma		Uveitis		Steroid Induced		Others	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0-10 years	4	2	3	1	0	0	0	0		
11-20 years	8	0	0	0	4	4	3	3		
21 & above	6	0	3	0	7	11	2	2	12	8

Steroid induced Glaucoma were 10 in number, 5 males and 5 females, all above 11 year age group. Other Secondary Glaucomas of miscellaneous aetiology like pseudophakia, Aphakia, Keratitis, Corneal ulcer were 20 in number, male and female ratio was 3:2.

Glaucoma associated with Diabetes and Hypertension were 49 in no. (5.9%). Male:female 30:19. Amongst these, 16 cases were associated with vascular occlusion like CRVO, BRVO and neovascular glaucoma. Nine being males and 7 females all above 41 years age group.

Table 4: Glaucoma associated with Diabetes/Hypertension

Age group	Without CRVO/BRVO		With CRVO/BRVO	
	Male	Female	Male	Female
41-60 years	12	4	5	4
61 years & above	9	8	4	3
Total	**21**	**12**	**9**	**7**
	33		**16**	

Secondary Glaucoma were 40. Amongst this group, Phacomorphic and phacolytic glaucomas were the main cause. 18 cases were phacomorphic and 8 were of phacolytic type. Out of 18 phacomorphic, 12 were females and 6 were males and found to be more common in 41-60 years age group. Out of 8 Phacolytic cases, 5 were males and 3 females, all above 61 years age group.

Table 5: Lens Induced Glaucoma

Age Group	Phacomorphic		Phacolytic	
	Male	Female	Male	Female
21-40 years	0	0	0	0
41-60 years	4	8	0	0
61 years & above	2	4	5	3
Total	**6**	**12**	**5**	**3**
	18		**8**	

Table 6: Others Lens Associated Secondary Glaucoma

Age Group	Pseudoexfoliation		Ectopialentis Subluxated dislocated lens etc	
	Male	Female	Male	Female
21-40	0	0	2	
41-60	2	2	3	
61 and above	3	2	0	
Total	**5**	**4**	**5**	
	9		**5**	

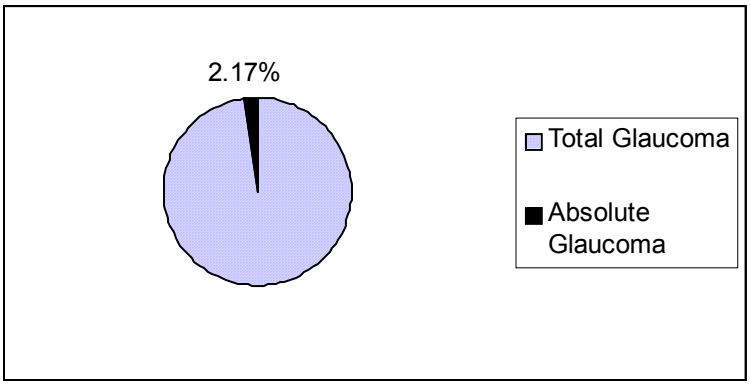
This showed that incidence of phacomorphic Glaucoma is more common than phacolytic. The former type was more common in females, whereas the later type found to be slightly more in males.

Other lens associated Glaucomas were 14 in number, 9 male and 5 female. Amongst this group, 9 were pseudo exfoliation (PXF) cases, (Male:female ratio is 5:4). All above 60 years and 5 cases were due to ectopia lentis and subluxated lens all being males in 21-60 years age.

End stage Glaucoma or absolute glaucoma cases without light perception were 2.17% (n=18). Amongst Glaucoma blind cases, 2 were congenital male children, 5 were POAG (Male:female =3:2), 5 were PACG, (Male:female = 1:4), 6 cases were absolute secondary glaucomas of diverse aetiology like CRVO, NVG, Trauma, Pseudophakic/Aphakic (Male:female=5:1).

Table 7: Absolute Glaucoma

Age	Types of Glaucoma							
	Congenital		POAG		PACG		Secondary	
	Male	Female	Male	Female	Male	Female	Male	Female
0-10 years	2							
11-20 Years								
21-40 years								
41-60 years			1	1	1	2	4	1
61 & above years			2	1		2	1	



Discussion

Since the purpose of this study was to find out the age, sex, pattern and incidence of all types of Glaucoma cases as well as causative factors of secondary Glaucomas to assess need for strategic planning to upgrade Glaucoma service at NEH in order to have early diagnosis and management; racial, demographic, socio-economic and other details were not included.

Nepal Blindness Survey done in the year 1981 showed that incidence of Glaucoma was 3.2%. However, detail breakdown of the disease was not available[1].

The prevalence of glaucoma noted at KEH was 1 percent [4] which is slightly grater than our's (0.74%). However, it is more than what was found at Rapti (0.42%) and Chitwan (0.26%)[5]. Slightly lower prevalence rate as seen in our studies (0.74%) as compared to 1981 Blindness Survey1 (3.2%) and KEH study (1%), may be due to the fact that many of the cases are not coming to hospital due to lack of awareness and knowledge about the disease.

Present study showed slightly greater prevalence of Glaucoma in females (50.4%) as compared to males (49.6%), which was identical with previous studies done at Dang and Bharatpur[5].

POAG was commonest of all Glaucoma in our study (57.3%) which is almost similar to various earlier studies done at different times at the different part of the world.[6,7,15,16,17].

PACG found to be about 3 times less common (19.9%) than POAG and more than 3 times more common in females which is identical with earlier studies done at different times at different parts of the world.[6,7,15,16,17].

Incidence of secondary Glaucoma is on rise 20.8% which is comparable with what was observed earlier at NEH[3].

Common attributing factors were found to be DM, HTN (5.97%) with vascular occlusion, ocular trauma, ocular inflammation and lens related glaucomas, which is comparable to those noted at other institution[10,18].

Glaucoma blind in this study was 2.17% which included total blind cases only without light perception. This was less than earlier studies as observed in Africa and other parts[19]. (14 to 18%). This is because all Glaucoma cases with vision less than 3/60 in better eye were considered as blind population in their study on contrary to ours with no perception of light in the affected eye only.

It seems quiet a large number of the Glaucoma cases are under diagnosed and misdiagnosed and many of the cases do not come for check up due to lack of awareness as well as various geographic, economic, social and financial and constraints. Early detection of the disease is essential. Awareness about the disease and screening in community level and hospital for diabetes, HTN, IOP measurement, Fundus examination is essential. Tertiary service in hospital with well equipped Glaucoma clinic with automated perimeter, Retinal nerve fibre analyser and laser facilities are required. Cataract and lens problem (4.8%) is still responsible for causing Glaucoma, hence motivation for timely surgery and awareness about cataract sequalae be imparted to the public. Facilities for congenital glaucoma evaluation and surgery be enhanced and regular general anaesthetist service be there in hospital.

Conclusion

Glaucoma found to be slightly more common in females as compared to males (50.4%:49.6%).

Secondary Glaucoma is the second most common cause after POAG. Diabetes Mellitus, Lens related and inflammatory ocular diseases being most common causative factor for secondary glaucoma. Early diagnosis and timely intervention is necessary to decrease the incidence of blindness due to Primary and Secondary Glaucomas.

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