

**PROFILE OF GLAUCOMA IN A TERTIARY CARE CENTER OF KUMAON REGION, HALDWANI UTTARAKHAND**Kalpana<sup>1</sup>, Govind Singh Titiyal<sup>2</sup>, Vimlesh Sharma<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT: BACKGROUND:** To study the profile of glaucoma in patients  $\geq 35$  years of age attending eye Out Patient Department in a tertiary care center of Kumaon region in Uttarakhand. **METHODS:** A cross sectional study was conducted in Out Patient Department of Ophthalmology from November 2012 to October 2014. Total 200 patients were included in this study based on inclusion and exclusion criteria's. **RESULTS:** Among 200 patients, profile of primary glaucoma identified included primary angle closure glaucoma 84(42%), primary open angle glaucoma 63(32%), glaucoma suspect 32(16%) and normal tension glaucoma 21(10%). Among subtypes of angle closure glaucoma, spectrum was primary angle closure suspect 9(10.71%), primary angle closure 15(17.86%) and primary angle closure glaucoma 60(71.43%). Male patients were 106(53%) and female patients were 94(47%). **CONCLUSION:** Primary angle closure glaucoma was observed most commonly followed by primary open angle glaucoma. Glaucoma was significantly associated with increase in age. Male patients outnumbered female patients. However, females were diagnosed more with primary angle closure glaucoma.

**KEYWORDS:** Primary Open Angle Glaucoma, Primary Angle Closure Suspect, Primary Angle Closure, Primary Angle Closure Glaucoma, Normal Tension Glaucoma, Glaucoma Suspect, Profile, Tertiary care center.

**INTRODUCTION:** Glaucoma is the second most common cause of preventable blindness in the world. It is a major public health problem, causing visual impairment which hampers day to day work. It is estimated that over 60.5 million people throughout the world affected by open angle glaucoma and angle closure glaucoma, and will be increasing to 79.6 million by the year 2020.<sup>[1]</sup>

The disability caused by glaucoma is irreversible. It is a 'silent killer' as most of the time, it is asymptomatic up to the very advanced stage and at the time of presentation to the ophthalmologist, the visual loss is often irrecoverable.

In public health context, this can be seen as an optic neuropathy associated with characteristic structural damage to the optic nerve and associated visual dysfunction that may be caused by various pathological processes.<sup>[2]</sup> Although glaucoma more commonly affects older adult, it can occur in all segments of society, with significant health and economic consequences.<sup>[3]</sup> A troublesome yet consistent finding across various population based studies is that a large portion of glaucoma remains undiagnosed.<sup>[4]</sup> In developed countries 50% of patients with glaucoma do not know that they have this disease.<sup>[5,6,7]</sup>

Strategies for early detection of glaucoma could reduce the high risk of blindness resulting from glaucoma.<sup>[8]</sup> In India every eighth person above the age of 40 years is either suffering from glaucoma or is at high risk of disease. Therefore, to detect glaucoma, it is necessary to perform a comprehensive eye evaluation on every person who comes to an eye care system.<sup>[9]</sup>

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Understanding the pattern and the associated characteristics of glaucoma is an essential and crucial step to develop strategic plans and corresponding intervention programs.

**MATERIAL AND METHODS:** This cross sectional study was conducted from November 2012 to October 2014 in Out Patient Department (OPD) of Ophthalmology. Patients, more than or equal to 35 years of age were included based on inclusion and exclusion criteria.

**Inclusion Criteria:**

- i. Glaucoma suspect.
- ii. Primary open angle glaucoma.
- iii. Primary angle closure glaucoma.
- iv. Normal tension glaucoma.

**Exclusion Criteria:**

- i. Congenital glaucoma.
- ii. Juvenile glaucoma.
- iii. History of trauma.
- iv. Secondary glaucoma.
- v. Age less than 35 years.

Data was collected on predesigned, pretested questionnaire. The questionnaire consisted of three sections:

- i. First section covers the identification details.
- ii. Second section covers the detailed history related to glaucoma and general examination.
- iii. Third section covers the detailed ocular examination.

**Examinations Include:**

- Visual acuity on Snellen's chart.
- Slit lamp examination.
- Tonometry with Goldmann's applanation tonometer.
- Direct Ophthalmoscopy followed by stereoscopic examination of fundus with 90D lens.

**Suspected patients were further evaluated by:**

- Gonioscopy.
- Visual field testing using automated perimeter (Humphrey).

**Definition Criteria**<sup>[10]</sup>

**Primary Open Angle Glaucoma (POAG):**

- Open angle on gonioscopy.
- IOP >21 mm of Hg without any apparent ocular or systemic abnormality that might account for raised IOP.
- Typical glaucomatous optic nerve head changes and/or Glaucomatous visual field defects.

## **Glaucoma Suspect (GS):**

Open angle by gonioscopy, and one of the following in at least one eye:

- IOP >21 mmg by applanation tonometry.
- Optic disc s/o glaucomatous changes.
- Diffuse or focal narrowing of disc rim.
- Diffuse or focal retinal nerve fibre layer (RNFL) abnormalities.
- Disc haemorrhage.
- CDR difference >0.2 between fellow eyes.
- Visual fields suspicious for early glaucomatous damage.

## **Normal Tension Glaucoma (NTG)**

- Open angle on gonioscopy
- IOP  $\leq$ 21mm of Hg.
- Glaucomatous optic disc changes.
- Visual field defects.
- No. other secondary cause of glaucoma.
- Primary angle closure glaucoma was classified according to ISGEO<sup>[11]</sup> classification in following types:

## **Primary Angle Closure Suspect (PACS)**

- Irido-Trabecular Contact (ITC)  $\geq$ 270 or angle grade  $\leq$ II.
- Normal IOP, optic disc and visual field.

## **Primary Angle Closure (PAC)**

- ITC+.
- Raised IOP.
- PAS.
- Normal optic disc.
- No field defects.

## **Primary Angle Closure Glaucoma (PACG)**

- PAC with optic disc changes/ Visual field defects.

Analysis was done using SPSS version 16. Chi square test was used as test of significance to find the association between glaucoma and other variables.

**RESULTS:** There were total 200 patients. Among them, most commonly diagnosed glaucoma was primary angle closure glaucoma 84(42%) followed by primary open angle glaucoma 63(32%). Glaucoma suspects were 32(16%) while normal tension glaucoma was observed in 21(10%). (Table 1).

Table 2 showed that Primary Angle Closure Glaucoma was the most common angle closure Subtype, observed in 60(71.43%) patients followed by primary angle closure 15(17.86%) while Primary angle closure suspect were observed in 9(10.71%) patients.

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In POAG group mean age of presentation among male patients was  $56.07 \pm 11.29$  years whereas among female mean age of presentation was  $55.92 \pm 11.29$  years. In PACG group mean age of presentation among male patients was  $56.03 \pm 11.29$  years whereas among female mean age of presentation was  $55.91 \pm 11.29$  years. In glaucoma suspects mean age of presentation among male patients was  $55.84 \pm 12.06$  years whereas among female mean age of presentation was  $56.04 \pm 12.41$  years. In NTG mean age of presentation among male patients was  $56.24 \pm 11.69$  years whereas among female mean age of presentation was  $56.25 \pm 11.29$  years. (Table 3).

POAG was most frequently seen in age group  $\geq 65$  years (36.50%) followed by 55-65 years (31.74%). PACG was most common in age group 55-65 years (42.86%). The disease burden of glaucoma was seen more in higher age group and this difference was found to be statistically significant ( $\chi^2=18$ ,  $df=9$ ,  $p=0.035$ ). (Table 4).

Sex wise distribution of all patients is given in table 5. Males patients 106(53%) outnumbered females 94(47%).

Sex wise distribution of glaucoma is given in Table 6 which showed that POAG was more common in male patients 40(37.74%) as compared to females 23(24.7%). PACG was more commonly seen in female patients 49(53.13%) as compared to male 35(33.02%). This difference was found to be statistically significant ( $\chi^2= 8.69$ ,  $df=3$ ,  $p=.034$ ).

Total 44 patients (22%) had unilateral or bilateral blindness (as per WHO criteria). Among these 44 patients 32(72.72%) had unilateral blindness and 12(27.27%) had bilateral blindness. POAG caused unilateral blindness in 12(27.27%) and bilateral blindness in 8(18.18%) patients. PACG caused unilateral blindness in 19(43.18%) and bilateral blindness in 3(6.81%) patients. (Table 7).

**DISCUSSION:** Worldwide open angle glaucoma is more common but among Asians prevalence of angle closure glaucoma is more.<sup>[1,12]</sup> Das J et al<sup>[13]</sup> in a study of profile of glaucoma in a major eye hospital in north india showed that PACG was the most common glaucoma subtype. Male dominance was seen for POAG and female dominance was seen for acute or intermittent ACG glaucoma. Ichhpujani P et al<sup>[14]</sup> in a hospital based study in North India showed that PACG was the most common angle closure subtype. Ramakrishnan R et al<sup>[15]</sup> in glaucoma in a rural population of southern India: the Aravind comprehensive eye survey showed that increasing age and male gender were significantly associated with POAG. Dandona et al<sup>[8]</sup> in Angle-Closure glaucoma in an urban population in southern India. The Andhra Pradesh Eye Disease Study observed increasing age and female gender to be more common with angle closure glaucoma.

Our study also showed that most common type of glaucoma in this tertiary care center of Kumaon region was primary angle closure glaucoma (42%) followed by primary open angle glaucoma (32%), glaucoma suspect (16%) and NTG (10%). Prevalence of glaucoma was found to be increasing with increase in age. POAG was more common in male patients and PACG was more commonly seen in female patients and was found statistically significant.

In this study mean age of presentation in POAG group for males and female was  $56.07 \pm 11.29$  years and  $55.92 \pm 11.29$  years respectively. In PACG group mean age of presentation for male was  $56.03 \pm 11.29$  years and female was  $55.91 \pm 11.29$  years respectively. This was comparable to various other studies.<sup>[8,13,14,15]</sup> Das et al<sup>[13]</sup> observed bilateral blindness in 8 to 14% of patients in various subtypes of angle closure glaucoma while Ramakrishnan R et al<sup>[15]</sup> observed that 20.9% were blind in

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either eye due to POAG. In our study 22% had unilateral or bilateral blindness due to glaucoma. Among these 22% patients, 10% blindness was due to POAG, 11% due to PACG and 1% due to NTG.

**CONCLUSION:** In our study most common glaucoma was primary angle closure glaucoma. PACG was the most common angle closure subtype followed by PAC and PACS. Glaucoma was significantly associated with increase in age in POAG and PACG. Male and female preponderance was found in POAG and PACG respectively. 22% patients had unilateral or bilateral blindness due to glaucoma.

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GLAUCOMA SUBTYPES	NO. OF PATIENTS	PERCENTAGE (%)
POAG	63	32
PACG	84	42
NTG	21	10
GS	32	16
<b>Total</b>	<b>200</b>	<b>100</b>

Table 1: Distribution of Glaucoma in Study Subjects

GLAUCOMA SUBTYPE	No.	%
PACS	9	10.71
PAC	15	17.86
PACG	60	71.43
<b>TOTAL</b>	<b>84</b>	<b>100</b>

Table 2: Subtypes of Primary Angle Closure Glaucoma in Study Subjects

Sex	POAG	PACG	GS	NTG
MALE	56.07±11.29	56.03±11.29	55.84±12.06	56.24 ±11.69
FEMALE	55.92 ±11.29	55.91 ±11.29	56.04±12.41	56.25±11.29

Table 3: Mean Age of presentation in Study Subjects

Age Group (Years)	POAG		PACG		GS		NTG	
	No.	%	No.	%	No.	%	No.	%
35-45	10	15.88	12	14.29	9	28.12	2	9.53
45-55	10	15.88	22	26.19	10	31.25	7	33.33
55-65	20	31.74	36	42.86	10	31.25	6	28.57
≥65	23	36.50	14	16.66	3	9.38	6	28.57
<b>Total</b>	<b>63</b>	<b>100</b>	<b>84</b>	<b>100</b>	<b>32</b>	<b>100</b>	<b>21</b>	<b>100</b>

Table 4: Pattern of Glaucoma according to Age

Sex	No.	%
MALE	106	53
FEMALE	94	47
<b>TOTAL</b>	<b>200</b>	<b>100</b>

Table 5: Sex wise distribution of Study Subjects

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Sex	POAG		PACG		GS		NTG		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Male	40	37.74	35	33.02	17	16.04	14	13.20	106	100
Female	23	24.47	49	52.13	15	15.96	7	7.44	94	100

Table 6: Sex wise distribution of Glaucoma

Blindness	POAG		PACG		GS		NTG		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Unilateral	12	27.27	19	43.18	0	0	1	2.27	32	72.72
Bilateral	8	18.18	3	6.81	0	0	1	2.27	12	18.18
<b>Total</b>	<b>20</b>		<b>22</b>		<b>0</b>	<b>0</b>	<b>2</b>		<b>44</b>	<b>100</b>

Table 7: Blindness in Study subjects

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