

# Profile of Primary Angle Closure Glaucoma in Patients having Diabetes at Tertiary Hospital of Kumaon Region, Uttarakhand

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## ABSTRACT

**Introduction:** Glaucoma is important cause of blindness world wide. Primary angle closure glaucoma is more prevalent in south east asian countries, because of anatomical reason in asian peoples. This study was carried out to study the profile of primary angle glaucoma and to study the profile of subtypes of Primary Angle Closure Glaucoma in patients having diabetes at Tertiary hospital of Kumaon.

**Material and methods:** This study was conducted in out patient department (OPD) of ophthalmology at Sushila Tiwari hospital, Haldwani from November 2012 to November 2014. Total 225 patients were included in this study on the basis of inclusion and exclusion criteria. A complete ophthalmological and systemic examination was done.

**Results:** In present study primary angle closure glaucoma was the commonest type of glaucoma 95 (42.2%), followed by primary open angle glaucoma 72 (32%). Most the patients in primary angle closure glaucoma (PACG) were females (59.4%) in this study. Majority (41.6) were in older age group of 56-65 years. This study also shows that PACG subgroup was most common (68.8%) among all three categories, followed by PAC (17.9%) and PACS were diagnosed in 10.5% cases. Ocular pain was the commonest presenting symptom of PACG subgroup (47.1%), with highest mean IOP recorded in PACG group (23.04).

**Conclusion:** PACG was the most common angle closure subtype followed by PAC and PACS in Kumaon region. Increasing age and females were more associated with primary angle closure glaucoma. In our study female gender, diminution of vision, presence of ocular pain, were diagnosed in PACG stage of primary angle closure glaucoma.

**Keywords:** Primary angle closure glaucoma, primary angle closure, primary angle closure suspect, kumaon, gonioscopy.

## INTRODUCTION

Glaucoma is the second most common cause of preventable blindness in the world. Approximately 60.5 million people throughout the world affected by open angle glaucoma and angle closure glaucoma, and this number will be increasing to 79.6 million by the year 2020.<sup>1</sup> Unfortunately large number of people remain undiagnosed, because of nonspecific symptomatology of this disease, various population based studies have also endorsed this fact. Primary angle closure glaucoma (PACG) has been reported to be more prevalent in South East Asian countries than the rest of the world.<sup>2</sup> In a study in a North Indian hospital<sup>3</sup> PAC and glaucoma constituted 45.9% of all primary adult glaucoma seen. This is attributed to the fact that Asians usually have smaller eyes, associated with shorter axial length as compared to others. And also in hilly areas as in Kumaon region of Uttarakhand, peoples still have eye structure more prone for angle closure.

Various studies have been done in different regions of India to study the profile of primary angle closure glaucoma but

yet no such study has been performed in Kumaon region of Uttarakhand.

This is a cross sectional study to analyze the demographic and clinical profile of primary angle closure glaucoma in a tertiary hospital of Kumaon region.

## MATERIAL AND METHODS

This study was conducted in Out Patient Department (OPD) of Ophthalmology, Dr. Susheela Tiwari Government Hospital, attached to the Government Medical College, Haldwani, District Nainital, Uttarakhand. The period of study was 1.5 years i.e. from November 2014 to April 2016. All the 95 Patients who visited the OPD and were diagnosed as primary angle closure glaucoma and were classified in their subtypes, based on their presenting complaints, best Corrected Visual Acuity (BCVA) using Snellen's chart, Intra ocular pressure (IOP-by Goldmann applanation tonometer), gonioscopy (using single mirror gonioscopes), optic nerve head evaluation with 90 D biomicroscopic lens and Humphrey threshold 24-2 visual field analysis using Swedish interactive threshold algorithm (SITA) strategy were included in the study.

Patients with primary open angle glaucoma, Congenital glaucoma, Juvenile glaucoma, Secondary glaucoma and those who were < 35 years of age were excluded from the study.

Those who were found to have angle closure were further classified using International Society of Geographical and Epidemiological Ophthalmology (ISGEO) Classification.<sup>2</sup>

ISGEO classification:

### Primary Angle Closure Suspect (PACS)

Posterior irido trabecular contact (ITC)  $\geq 270^\circ$   
Normal IOP, optic disc and visual field

### Primary Angle Closure (PAC)

Posterior irido trabecular contact (ITC)  $\geq 270^\circ$   
Raised IOP and/or Peripheral Anterior synechiae  
Normal optic disc  
No field defects

### Primary Angle Closure Glaucoma (PACG)

PAC with optic disc changes/ Visual field defects

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Systemic examination was done by physician (cardiovascular examination, blood pressure, and relevant investigation regarding blood sugar fasting and postprandial and HbA<sub>1c</sub>). For this diabetic and hypertensive patients were followed up in diabetic clinic at our hospital. All patients were examined for diabetes.

**STATISTICAL ANALYSIS**

The data collected was coded and entered into Microsoft Excel. Analysis was done using SPSS version 16 and descriptive interpretation of data was done in the form of percentages.

**RESULTS**

Overall 225 glaucoma patients were selected on the basis of inclusion criteria from outpatient department.

PACG was the commonest type of glaucoma accounting for 42.2% of cases, followed by primary open angle glaucoma (32%). Primary angle closure subtypes PACG was the most common subtype, observed in (71.6%) patients followed by PAC (17.9%) while PACS were observed in (10.5%) patients (Table-1).

Patients of glaucoma progressively increased as the age advanced, and was highest (42.10%) in the age group of 56-65 years but beyond 65 years of age group number of glaucoma

patients were only 17.89%. In our study 59% patients were female and 41% were males (Table-2)

Most of the patients(54.73%) were having visual acuity in the range of 6/6-6/18, and only 4.21% patients were presented with no light perception. Patients in PACS and PAC subtypes the diminution of vision was less when compared with PACG subtype, where it was severely diminished (Table-3).

Ocular pain was the commonest presenting symptom of PACG group(47.1%), while 23.5% of patients of PAC group also complained of ocular pain. The second commonest symptoms in PACG group was decreased vision (41.1%).

The 90% patients in PACS and 52.9% patients in PAC group were not having any symptoms of glaucoma. In present study highest mean IOP was recorded in PACG group (23.04), and lowest in PACS (16.72) (Table-4).

**DISCUSSION**

Worldwide open angle glaucoma is more common but among Asians prevalence of angle closure glaucoma is more.<sup>1,3</sup> Possible explanation of increased prevalence of angle closure glaucoma is because of inherent structural factors in Asian eyes like small hyperopic eyes<sup>4,5</sup> and short axial length.<sup>6</sup>

In this study PACG was the most common angle closure subtype; observed in (68.8%) patients followed by PAC

	Types of Glaucoma				Subtypes of primary angle closure glaucoma		
	POAG	NTG	GS	PACG	PACS	PAC	PACG
No. of Patients (%)	72(32%)	22(9.7%)	36(16%)	95(42.2%)	10 (10.5%)	17 (17.9%)	68 (71.6%)

**Table-1:** Showing types of Glaucoma and subtypes of Primary angle closure glaucoma

Age group	N. of patients(%)
35-45	14(14.73)
46-55	24(25.26)
56-65	40(42.10)
>65	17(17.89)
Total	95(100)

**Table-2:** Age wise distribution of patients with primary angle closure

Visual acuity (BCVA)	Subtypes of angle closure glaucoma			
	PACS (n.)	PAC(n.)	PACG (n.)	Total n.(%)
6/6-6/18	9	10	33	52(54.73)
<6/18-6/60	1	7	26	34(35.78)
<6/60-3/60	0	0	3	3(3.15)
<3/60-Perception of light	0	0	2	2(2.10)
No light Perception	0	0	4	4(4.21)
Total	10	17	68	95(100)

**Table-3:** Visual acuity at presentation among the patients with primary angle closure

Symptoms	Subtypes of angle closure glaucoma			
	PACS(%) (n-10)	PAC(%) (n-17)	PACG(%) n-68	Total(%) n-95
Asymptomatic	9(90)	9(52.9)	0	18(18.94)
Decreased vision	1(10)	3(17.6)	28(41.1)	32(33.68)
Heaviness	0	1(5.9)	4(5.9)	5(5.26)
Headache	0	1(5.9)	15(22.1)	16(16.84)
Colored haloes	0	0	5(7.4)	5(5.26)
Ocular pain	0	4(23.5)	32(47.1)	36(37.89)
Mean IOP(mmHg)	16.72	18.32	23.04	

**Table-4:** Showing symptoms and mean IOP in primary angle closure subtypes

(19.4%) and PACS (11.6%) patients. In similar study by Paul *et al* from Kolkata India, PACG was most common entity.<sup>7</sup> Similar finding was observed by Ichhpujani P *et al*<sup>8</sup> in a hospital based study in North India. Prevalence of glaucoma was found to be increasing with increase in age and similar observations were seen in various other studies.<sup>9-11</sup> In this study most of the patients were in the age group of 56-65% years, followed by in the age group of 46-55 years. In various other studies<sup>9-11</sup> the mean age of patients with glaucoma was comparable to this study. In our study PACG was more common in females (59%) than in males. Das J *et al*<sup>3</sup> studied that female preponderance was seen for acute or intermittent ACG glaucoma. Similar remark was made by Ramakrishnan R *et al*<sup>12</sup> Arvind Comprehensive Eye Survey in Southern India. Chennai Glaucoma Study (CGS) also reported that PAC and PACG was more common in women.<sup>13</sup>

In our study most common presenting symptom in PACG group was ocular pain followed by decreased vision. In contrast to this Sihota *et al*.<sup>14</sup> also documented ocular pain to be most common in the acute and subacute angle closure glaucoma, 62.1% and 45.5% respectively.

Patients in PACS and PAC subtypes the diminution of vision was less when compared with PACG subtype, where it was severely diminished. As the PACS, PAC and PACG are the spectrum of the same disease, so as the disease advances it is expected that visual acuity will also worsen and it is also obvious from our study that number of patients having poor visual acuity are in the group of advance stage of disease that is in PACG subtype. Mean IOP was greater in PACG group as compared with PACS and PAC, this is due the fact that with advancing course of disease mean IOP used to increase. It correlated with study done by Paul *et al*<sup>15</sup> who also documents that mean IOP increases with stage of disease.

## CONCLUSION

In Kumaon region it was observed that primary angle closure glaucoma was commonest among primary glaucoma cases. PACG was the most common angle closure subtype followed by PAC and PACS. Increasing age and females are significantly associated with primary angle closure glaucoma. On the basis of study it seems unlikely that screening for diabetes among patients with closed angle glaucoma will uncover many undiagnosed diabetics.

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