

# A Cross Sectional Study To Assess Knowledge Of Primary Open Angle Glaucoma Among Medical Students

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**Objective:** To assess the knowledge of primary open-angle glaucoma among medical students from tertiary health centre, Punjab.

**Methods:** In this cross sectional study, we conducted a survey among medical students. The questionnaire had 11 questions about epidemiology, risk factors, symptoms, diagnosis, treatment and sequelae of primary open angle glaucoma (POAG). The students were also asked if they considered their knowledge about POAG sufficient. Student's characteristics (age, sex and intended area of specialization) were identified.

## Abstract

**Results:** Women comprised 60% of the students. 45% of students gave the correct answer that glaucoma is the leading cause of irreversible blindness worldwide. 48% of students identified POAG as having a genetic origin. Only 30% of students knew that POAG is asymptomatic and half of them (48%) knew that glaucoma blindness is irreversible. Many students (79%) correctly identified tonometry as an important tool for diagnosis and the glaucoma can be treated through medications (73%) or surgery (83%). Almost half of them (47%) considered their knowledge is insufficient.

**Conclusion:** Almost half of the participants believe that their knowledge of POAG is insufficient. The results of this study showed that the basic knowledge of POAG among medical students is less. This gap can lead to some serious consequences from both individual (blindness) and collective (negative impact in health system and society) perspectives.

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**Keywords:** Glaucoma, Poag, Medical Students, Blindness, Tonometry

## Introduction

Glaucoma is a major worldwide health concern because of its usually silent and progressive nature. Glaucoma is the second leading cause of blindness worldwide.<sup>1</sup> Glaucoma prevalence is estimated to affect more than 79.6 million individuals globally of which 74% will have POAG which can lead to blindness in 5.9 million individuals by 2020.<sup>2</sup>

Two major forms of glaucoma exist: open-angle glaucoma, in which aqueous humor has free access to the trabecular meshwork and angle-closure glaucoma, in which access of the aqueous humor to the trabecular meshwork is obstructed. Both forms of glaucoma are characterized by a progressive optic neuropathy with visual field loss and characteristic structural changes, including thinning of retinal nerve fiber layer and excavation of optic nerve head.<sup>3</sup>

The primary open-angle glaucoma (POAG) as first promulgated by the American Academy of Ophthalmology (AAO) in 1996 is defined as a multi factorial optic neuropathy with a characteristic acquired loss of optic nerve fibers. The definitive characteristics of glaucoma are based on visual field loss or the appearance of the disc or changes in the retinal nerve fiber layer.<sup>4</sup>

Risk factors for POAG include: older age, genetic predisposition, certain eye characteristics (such as thin cornea, myopia), low educational status, use of corticosteroids, smoking, thyrotoxicosis, lower ocular perfusion pressure, systemic alpha blockers, large cupdisc ratio (CDR) of the optic disc, African descent and family history of glaucoma.<sup>5</sup>

Management of POAG is focused on reducing the intraocular

pressure (IOP).<sup>6,7</sup> The American Academy of Ophthalmology recommends that in treating POAG, the target IOP should be a 25% reduction of the baseline or untreated IOP and that it should be subsequently managed on an individual basis.<sup>8</sup>

Since glaucoma blindness is irreversible it is important to diagnose and treat at an earlier stage. It is very important for the medical students to have a basic knowledge about glaucoma so that they can refer the patients to an ophthalmologist for appropriate diagnosis and management to prevent complications.

## Objective

To assess the knowledge of glaucoma among medical students from a tertiary health center in Punjab.

## Methods

A cross-sectional observational study was conducted from 2018 to 2020. The sample included 200 7th and 9th semester medical students of tertiary health center in Punjab. The study subjects were approached while in class, being randomly selected, their anonymity was maintained and were invited to answer the questionnaire voluntarily.

Inclusion criteria were medical students attending 7th & 9th semester and whoever immediately available to answer the questionnaire. For some students online responses for the questionnaire were recorded because they were attending online classes due to covid 19 pandemic. Students in other semesters, who were not immediately available to answer the questionnaire, who refused to participate, who did not answer the questionnaire in full or who did not provide their informed consent were excluded from the study.

The data collection instrument was a structured questionnaire which included 11 questions on epidemiology, risk factors, symptoms, diagnosis, treatment and sequelae of glaucoma which aims at testing the knowledge of subjects about the condition. The students were also asked if they considered their knowledge about POAG sufficient. Participants' age, gender and the medical specialty they intended to pursue were recorded.

**Results**

In total, 200 students were enrolled in the study, of which 100 were from 7th semester and the remaining 100 from 9th semester. The mean age of respondents was 22.8 years. 120 students were female and 80 were male.

Only 12% of respondents intended to specialize in Ophthalmology, while 84% intended to pursue another medical specialty and 4% had not yet chosen a specialty. A family history of glaucoma was found in 8% of respondents and 2% were unaware of glaucoma cases in their family, while most respondents (90%) stated there were no cases of the disease in their family.

(Figure 1) shows the responses of students when asked about the leading cause of irreversible blindness worldwide. Maximum number of students (45%) gave the correct answer, glaucoma. However, 24% of students chose cataract, 15% chose age related macular degeneration & 14% chose diabetic retinopathy. All students intending to specialize in Ophthalmology answered correctly. Glaucoma blindness was classified as irreversible by 48%

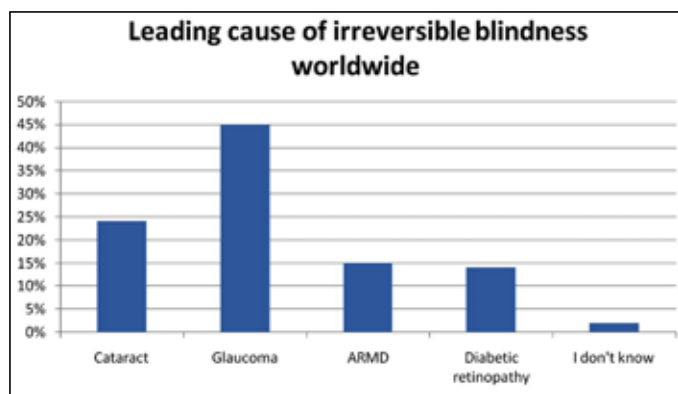


Figure 1: Leading cause of irreversible blindness worldwide according to respondents

of respondents, but 47% thought it was reversible with some treatment and 5% of students did not know whether glaucoma blindness was reversible or irreversible.

(Figure 2) shows the responses of students when asked about the most common type of glaucoma. Most of the students (80%) identified POAG as the most common type of glaucoma, 2% didn't know the answer and others gave incorrect responses.

Only 48% of the respondents correctly identified genetic factors as a cause of POAG and 2% did not know the answer. Most students (80%) wrongly identified raised IOP as a

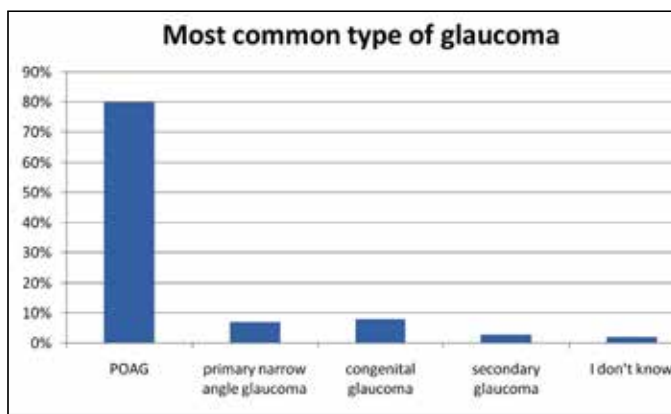


Figure 2: The most common type of glaucoma according to respondents

causal factor of POAG. There were no differences between groups based on intended medical specialty (p=0.782, chi-squared test) and significant difference was present between the groups based on study semester (p=0.045, chi-squared test) and family history of glaucoma (p=0.045).

(Figure 3) shows the variables identified by the respondents as risk factors for POAG. Most of students (83%) correctly mentioned high IOP as a risk factor for POAG. Family history of glaucoma was correctly identified as a risk factor by 71% of respondents. 58% of students mentioned high blood pressure and 51% of students mentioned myopia as risk factors for POAG. Many other important risk factors for POAG such as diabetes mellitus, ocular trauma, corticosteroids and black race were missed by most students.

(Figure 4) shows the response of students when they

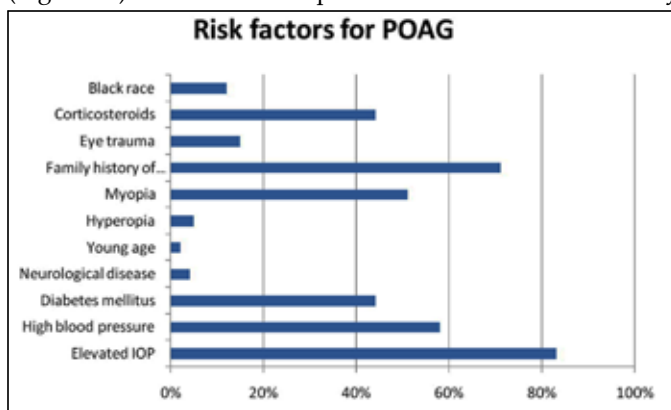


Figure 3: Risk factors of POAG according to respondents

were asked about the most common signs and symptoms of POAG. Only 30% correctly replied that POAG was asymptomatic. Several signs and symptoms were mentioned by respondents as a part of the clinical picture of POAG: sudden loss of central vision (23%), eye pain (54%), red eye (10%), tearing (6%), peri-ocular headache (29%), frontal headache (51%), photophobia (36%). 2% of respondents stated they did not know what the signs and symptoms of POAG were.

(Figure 5) shows the response of students when they were asked about the diagnostic tests for glaucoma. Most respondents (79%) gave correct responses that tonometry

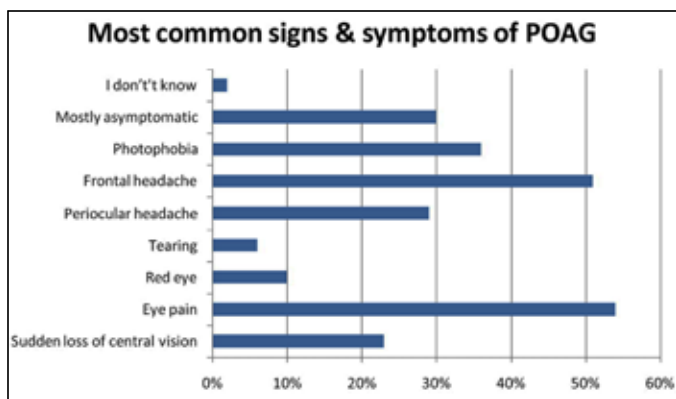


Figure 4: Most common signs and symptoms of POAG according to respondents

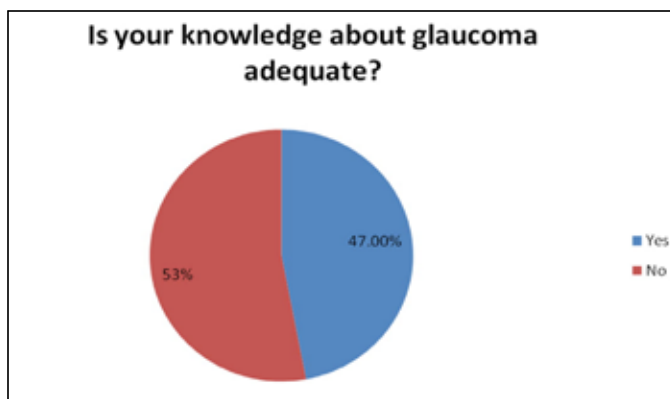


Figure 7: Proportion of students who thought knowledge of glaucoma which they had acquired during medical college was sufficient

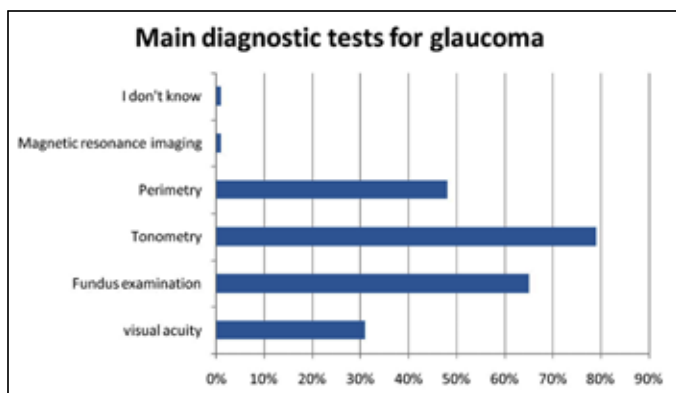


Figure 5: The main diagnostic tests for glaucoma according to respondents

(IOP measurement) is the main diagnostic test in the assessment of glaucoma, while 65% considered fundus examination and 48% considered perimetry as important tests for glaucoma.

(Figure 6) shows the distribution of answers regarding the treatment of glaucoma. Most respondents gave correct responses that glaucoma can be treated medically (73%) and surgically (83%). 49% of students mentioned that glaucoma can be treated by laser.

Majority of students (86%) gave the correct answer that successful glaucoma treatment promotes disease control by preventing blindness.

(Figure 7) shows the proportion of respondents who

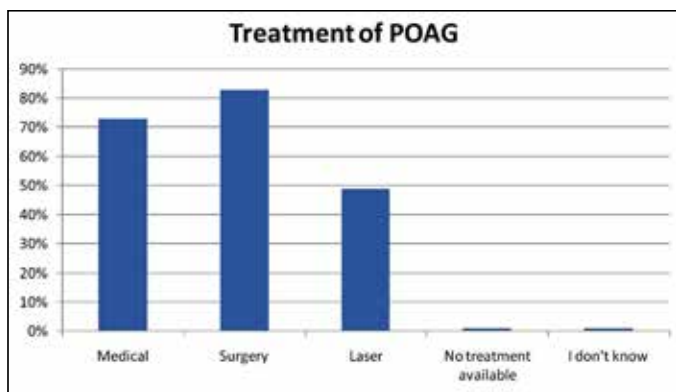


Figure 6: POAG treatment according to respondents

considered they had learnt enough about glaucoma during their medical studies.

### Discussion

This study found that students in the tertiary health centre were unable to answer about the main epidemiological and clinical characteristics and the therapeutic possibilities of glaucoma as per their responses to the standardized questionnaire used in this study.

The students in the 9th semester and those students who had a family history of glaucoma had better knowledge about the causes of primary open angle glaucoma. There were no significant differences between groups based on intended medical specialty. There were no differences found for other questions related to glaucoma between these groups. This may be due to small sample size.

As observed from this study, it is clear that the basic knowledge of POAG among respondents is less. So, it is mandatory for them to have a basic knowledge to be able to refer the concerned patients to an ophthalmologist for appropriate management.

It is also important for the medical students to have a practical experience and training in hospitals to help them to gain the required knowledge about glaucoma. Camp and campaigns can play a pivotal role in creating awareness regarding common and crucial conditions prevailing in the society. So, arranging camps and campaigns for the medical students can help them in gaining knowledge by coming in direct contact with the patient, thereby creating more awareness and hence more knowledge regarding the symptoms and adequate management of the patients.

POAG accounts for around 70% of the total glaucoma cases worldwide.<sup>9,10</sup> The most common modifiable risk factor is raised intraocular pressure.<sup>11</sup> Spread of knowledge regarding some well-recognized risk factors for glaucoma may encourage more awareness. These includes a positive family history of glaucoma, which is reported in 13% to 25% of patients with glaucoma.<sup>12,13,14</sup> Owing to the asymptomatic nature of glaucomatous

progression, it may remain undetectable in the majority of the cases until an advanced stage.<sup>15</sup>

Regardless of the form of POAG, current treatment is the same. This treatment comprises medication, laser and incisional surgery. All these treatments aim to relieve the pressure on the optic nerve either by slowing the rate of aqueous humor production or by increasing the rate of aqueous humor drainage. There is an array of medications to lower the IOP in POAG, which are divided into following classes: prostaglandin analogues, beta blockers, carbonic anhydrase inhibitors, cholinergic agonists (parasympathomimetics), alpha agonists, hyperosmotic agents, neuroprotective agents and rho kinase inhibitors.

In most of the questions there were no differences between groups based on intended medical specialty or study semester. This shows that misconceptions regarding important factors related to glaucoma are not limited to a particular semester in medical college.

### Conclusion

The results of this study showed that the basic knowledge of POAG among medical students is less. This gap creates major misconceptions about key issues such as the aetiology, risk factors, clinical features and treatment of glaucoma which can lead to missed diagnoses with serious consequences such as irreversible blindness.

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