

Assessment of Knowledge on Glaucoma amongst International Medical Students in Tbilisi, Georgia

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Abstract – Glaucoma is the second largest cause of blindness worldwide. Early diagnosis and appropriate examination are essential to prevent progressive vision loss in patients. The goal of the study was to assess the level of awareness on glaucoma amongst medical students studying in the Republic of Georgia. A survey comprising of 16 questions was distributed among medical students in their clinical and non-clinical years on world sight day on the first week of October 2021. The survey entailed questions ranging from etiology up to prognosis of glaucoma. A total of 129 responses were recorded, 10.1% (n=13) students showed interest in pursuing ophthalmology in the future. Only 55.8% (n=72) students had adequate knowledge on glaucoma and among them, 65% (n=53) of clinical year students performed well. Medical students in their clinical years were more aware about glaucoma compared to the ones in their non-clinical years however majority of students had inadequate knowledge on genetics, diagnostics methods and treatments related to glaucoma. Organizing interactive programs, seminars, and campaigns on glaucoma amongst medical students might bridge the gap and help in early diagnosis of glaucoma in patients, which will help in preventing progressive vision loss.

Keywords – Glaucoma; Medical Students; Ophthalmology; POAG.

I. INTRODUCTION

Glaucoma, commonly referred to as the “silent thief of sight” is currently the worldwide leading cause of irreversible blindness and the second largest cause of blindness all over the world. [1]

Based on prevalence studies, it was estimated that 79.6 million individuals would have glaucoma in 2020 and this number is likely to increase to 111.8 million individuals in 2040. Majority of the individuals with glaucoma were not aware that they were affected. It was estimated that more than 11 million individuals would be bilaterally blind due to glaucoma in 2020 (around 13% of the cases). [2] The ethnicity at highest risk for glaucoma is Asian and they represent most people with glaucoma worldwide (47%). [3]

The two most common associated genes for glaucoma are myocilin (*MYOC*, *GLC1A*) ([CCDS1297.1](#)) [4] and optineurin (*OPTN*, *GLC1E*) ([CCDS7094.1](#)). [5] Glaucoma follows an autosomal dominant trait; however, these genes account for less than 10% of all glaucoma cases worldwide. [6]

The two major forms of glaucoma are open angle glaucoma (OAG) and angle closure glaucoma (ACG). OAG is more prevalent in African derived people and ACG is more prevalent amongst Asians (87%). [7]

In OAG, the primary cause remains unclear while, the secondary cause is due to obstructed trabecular meshwork. This leads to decreased clearance of aqueous humor in the eye causing an elevated intraocular pressure (IOP). OAG is usually asymptomatic until later in its clinical course. It is commonly characterized by gradual loss of vision, mild headache, and impaired adaptations to darkness. [8]

In ACG, the primary cause is due to enlargement or anterior movement of the lens against central iris which leads to obstruction of normal aqueous flow through the pupil. The aqueous humor accumulates behind the iris causing it to push against the cornea. This impedes the flow of aqueous humor through the trabecular meshwork. The secondary cause can be due to underlying retinal disease that induces vasoproliferation in the iris which contracts the iridocorneal angle. ACG usually presents with extreme eye pain, blurred vision, sudden vision loss, halos around lights, frontal headaches, nausea, and vomiting. [9]

The risk factors for glaucoma include age > 40 years, family history, genetic predisposition, diabetes mellitus, prolonged use of corticosteroids, anterior uveitis, eye trauma and prolonged pupillary dilation (prolonged time in dark areas). [10]

The most common diagnostic measures taken are tonometry, ophthalmoscopic examination of the optic disc and visual field examination. The normal range for IOP is 12-22mmHg. During ophthalmoscopic visualization of the optic disc, atrophy, and characteristic thinning of the outer rim of the optic nerve head can be observed. [11] Early diagnosis and appropriate examination is essential to prevent the progressive vision loss.

The main goals of treating glaucoma are preventing vision impairment and hindering the progression of the disease, and it can primarily be achieved by decreasing the IOP. Reduction of the IOP by 25% or more (depending on the severity of the disease) has shown to slow the progression of OAG. [12] These target IOPs can be achieved by drugs like timolol (non-selective β -blocker) that decreases aqueous humor production and pilocarpine (muscarinic receptor agonist) that increases aqueous humor clearance. If medications cannot provide adequate relief in OAG, surgical treatments such as laser trabeculoplasty or trabeculectomy can improve aqueous humor drainage. Laser peripheral iridotomy can be curative and may be performed prophylactically for ACG. [13]

Various lifestyle modifications such as exercise, low fat and antioxidant rich diet, smoking cessation [14] and engaging in mindfulness meditation [15] helps in slowing the progression of glaucoma.

Since most of these cases remain undetected, raising awareness amongst medical students can aid in early diagnosis and promotion of preventive measures. This could lead to better prognosis of the disease.

II. OBJECTIVE

To assess the level of awareness amongst medical students about glaucoma.

III. METHOD

A survey was conducted amongst medical students for a period of 5 days which comprised of 16 questions.

These questions were regarding epidemiology, etiology, pathophysiology, risk factors, clinical presentation, and treatment of glaucoma. Student characteristics such as sex, their current year of study, and their intention to specialize in the field of ophthalmology were identified. Data was also collected on whether these medical students were satisfied with their knowledge about glaucoma.

IV. RESULTS

In the conducted survey, a total number of 129 responses were recorded. Of which 2.3% (n=3) are currently studying in their first year, 15.5% (n=20) are in their second year, 16.3% (n=21) are in their third year, 31% (n=40) are in their fourth year, 25.6% (n=33) are in their fifth year and 9.3% (n=12) are in their sixth year. Most of the responders (65.8%) were students in their clinical years.

The mean age of our responders was 21-24 years. Of our responders, 65.1% (n=84) responders were female and 34.9% (n=45) of responders were male.

10.1% (n=13) intended to specialize in ophthalmology, while 43.4% (n=56) might intend to specialize in ophthalmology and 46.5% (n=60) did not have any intent to specialize in this field.

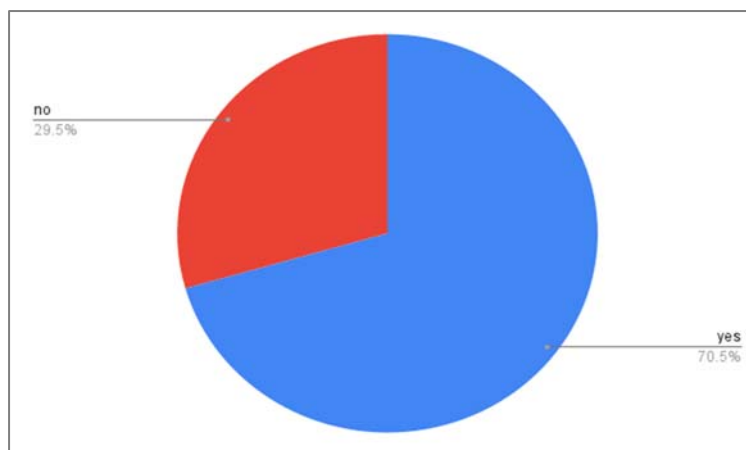


Figure 1: Response regarding have you come across the disease glaucoma?

(Figure 1) depicts the responses of students of which, 70.5% (n=91) have come across the disease glaucoma before, while 29.5% (n=38) have not.

When asked about which ethnicity is at highest risk for glaucoma, 34.9% (n=45) of the responders chose the option “Asian”, which was the correct answer. 33.3% (n=43) of the responders chose the option “African”, however this ethnicity is at higher risk for OAG. 31.8% (n=41) of the participants chose the incorrect answer.

When inquired about which age group is at highest risk for glaucoma, 90.7% (n=117) of the responders chose the option “40 and above” which was the correct answer, while 9.4% (n=12) chose the incorrect age group.

The medical students were questioned about what type of disease is glaucoma, on average 68.25% had chosen the two correct options “Hereditary and Acquired forms of Glaucoma” while, 12.8% chose the incorrect option.

A question about the types of glaucoma was posed and on average, 54.53% had opted the correct response “Open-angle, closed-angle, and normal-tension glaucoma”. Moreover, 36.05% chose the incorrect combination of options.

Only 15.5% (n=20) of the responders selected the correct option “MYOC and OPTN” when asked about the genes related to glaucoma. 15.5% of participants responded with the incorrect option. Most responders; 69% (n=89) were unaware of the genes associated with glaucoma.

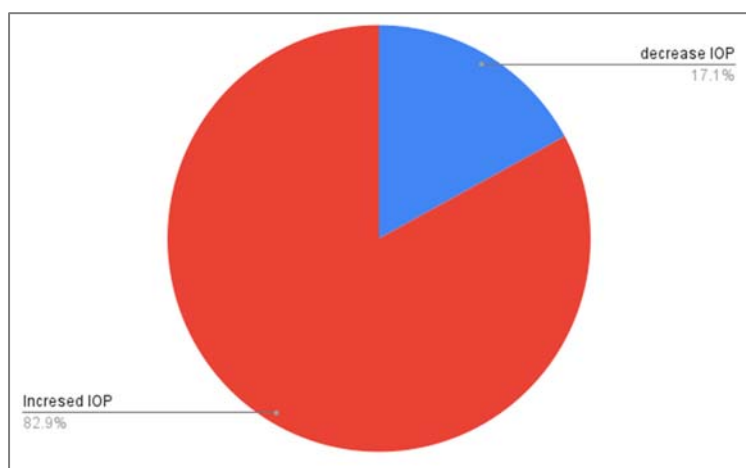


Figure 2: Change in IOP

(Figure 2) depicts that 82.9% (n=107) of the responders selected the correct option “increased intraocular pressure” while, 17.1% (n=22) of the responders selected the incorrect option when asked about the change in IOP in patients with glaucoma.

When asked about the pathogenesis of OAG, 51.9% (n=67) of the responders selected the correct option “obstruction of the trabecular meshwork” while, 48.1% (n=62) selected the incorrect option.

The students were inquired about the pathogenesis of ACG, 62% (n=80) of the responders selected the correct option “enlargement or anterior movement of the lens against the central iris due to an increase in intraocular pressure in the eye “while, 38% chose the incorrect option.

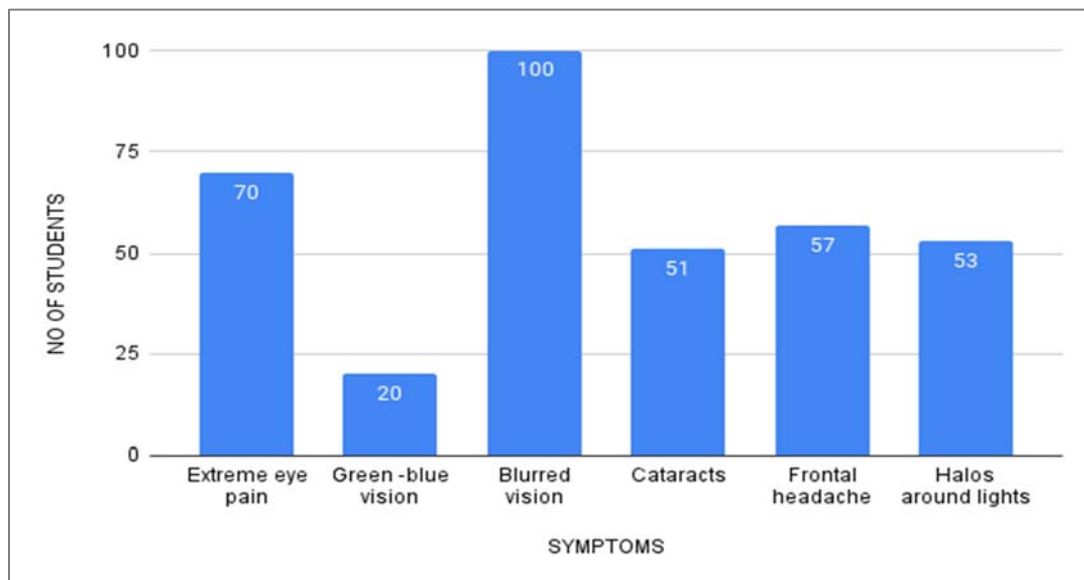


Figure 3: Symptoms observed with angle closure glaucoma

(Figure 3) portrays the responses when asked about symptoms observed in ACG. On average, 54.3% selected the correct combination of options “Extreme eye pain, halos, and lights, frontal headache, and blurred vision” while, 27.5% of responders selected the incorrect combination of options.

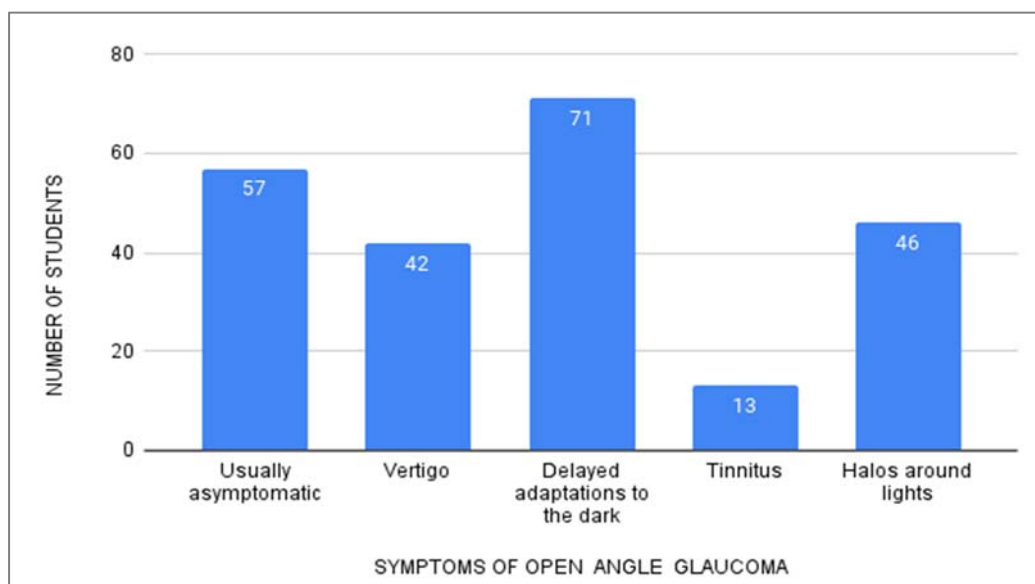


Figure 4: Symptoms observed with open-angle glaucoma

(Figure 4) represents the responses when asked about symptoms observed in OAG. 49.6% of students selected the correct combination of options “usually asymptomatic and delayed adaptation to the dark” while, 26.1% of students selected the incorrect combination of options.

When asked about the best diagnostic measures for glaucoma on average, 48.8% of the responders chose the correct combination of options “ophthalmoscopy, gonioscopy, perimetry and tonometry” while, 17.5% chose the incorrect combination of options.

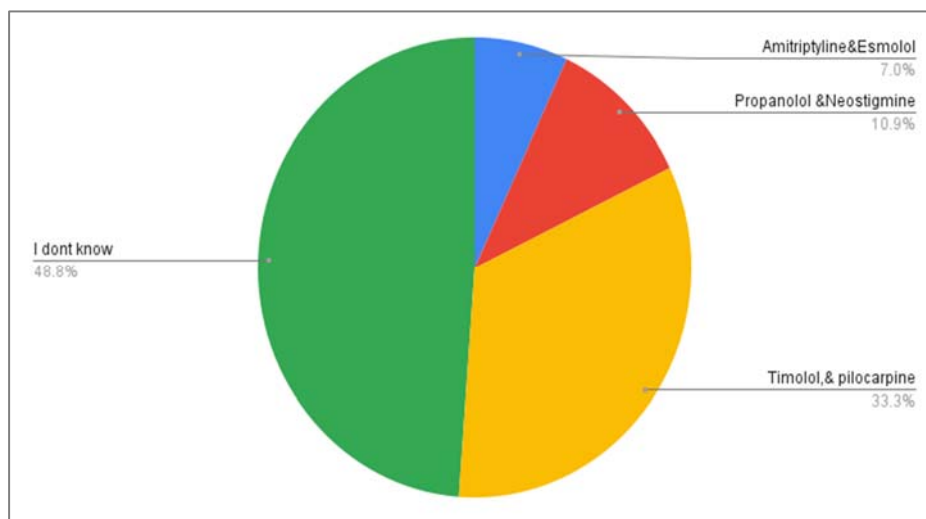


Figure 5: Pharmaceutical therapy for glaucoma.

(Figure 5) depicts the responses when asked about the best pharmaceutical therapy for glaucoma. 33.3% (n=43) of the responders selected the correct option “timolol and pilocarpine” while, 17.9% (n=23) of responders chose the incorrect option. Most of the responders; 48.8% (n=63) were unaware of the treatment.

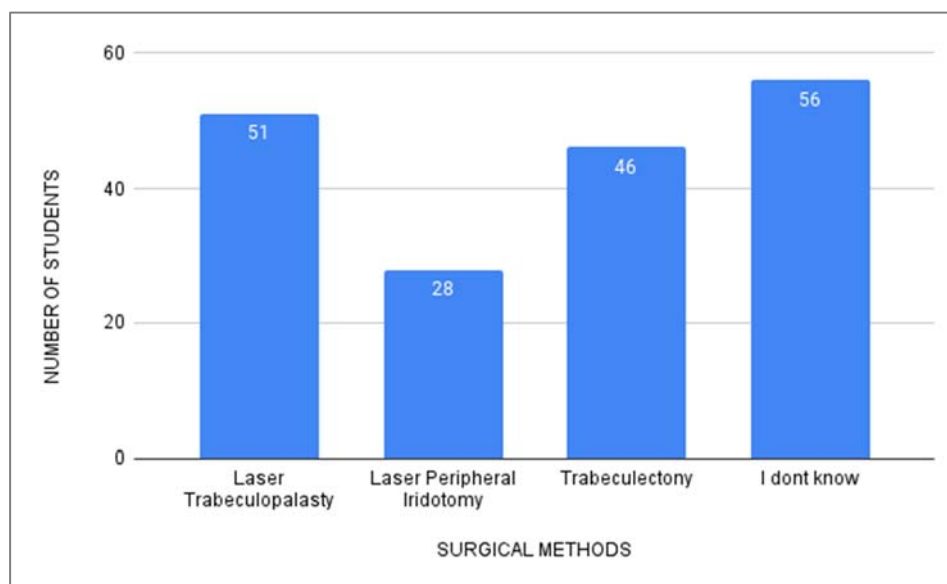


Figure 6: Best surgical methods for treatment of OAG

(Figure 6) depicts the responses when asked about the best surgical method used for treatment of OAG. On average, 37.6% of participants chose the correct option “trabeculoplasty and trabeculectomy” while, 21.7% of participants chose the incorrect option. Most of the responders; 43.6% (n=56) were unaware of the treatment.

A question was posed regarding the agents which are strictly contraindicated in the treatment of glaucoma, 19.4% (n=25) of the responders selected correct option “Mydriatic agents” while, 31% (n=40) of responders chose the incorrect option. Most of the responders; 49.6% (n=64) were unaware about the contraindicated agents.

The survey was culminated by asking the medical students whether they were satisfied with their knowledge on glaucoma. 17.8% (n=23) of the responders were satisfied, while 38% (n=49) of the responders were unsatisfied. Most of the responders; 44.2% (n=57) were neither satisfied nor unsatisfied.

V. DISCUSSION

This survey was conducted on “World Sight Day” to evaluate the level of awareness on glaucoma amongst international medical students studying in Tbilisi State Medical University and was presented to the department of ophthalmology on 14th October 2021.

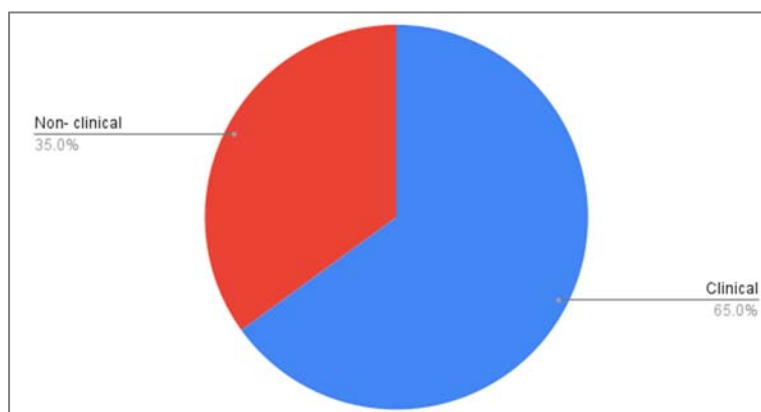


Figure 7: Comparison of adequate knowledge about glaucoma.

(Figure 7) portrays the analysis based on the survey conducted, comparing the knowledge about glaucoma amongst the clinical year and non-clinical year medical students. From this analysis of the data, majority of the medical students in their non-clinical years had inadequate knowledge on glaucoma. As observed from this survey, the general pathophysiology and underlying mechanism of action was well understood by the students. However, the students lacked concrete knowledge on genetic factors, diagnostic measures, and treatment.

A 2002 “Prevent Blindness America” survey concluded that blindness was the third most feared disability after cancer and heart disease. [16] It is essential for medical students to learn appropriate visual field examination, ophthalmoscopic visualization during their clinical years for the early detection of glaucoma. This would not only yield the best treatment, but also reduce the economic burden of glaucoma in society. A study in 2011 concluded that the cost of treating glaucoma in Europe and the US is proportional to the severity of the disease. [17,18]

Information in the form of webinars, workshops, campaigns, interactive events and newsletters [19,20,21] can broaden knowledge on aspects such as risk factors, clinical presentation, preventive, diagnostic measures, treatment and academic literature on glaucoma.

VI. CONCLUSION

The survey was conducted to analyze the level of awareness on glaucoma amongst medical students in Tbilisi, Georgia. The results of this survey indicated that awareness amongst medical students on glaucoma was low especially in the areas of diagnostic measures and treatment. However, based on comparative results, medical students in their clinical years had a broader understanding on glaucoma than the medical students in their non-clinical years.

Raising awareness on the risk factors and lifestyle modifications would lead to earlier diagnosis and significantly improve the prognosis of the disease.

Author contribution

Concept: Korrapati

Survey design: Abbas, Ahmed, Venkanna, Roy, Ajith, Unnikrishnan, Chandrababu

Manuscript writing: Abbas, Ahmed, Korrapati

Results segregation: Venkanna, Roy

Editing: Chandrababu, Unnikrishnan

Proof reading: Venkanna, Chandrababu

Final draft revision: Korrapati, Abbas, Ahmed

Supervision: Gabunia

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