To Assess the Awareness and Knowledge about Glaucoma in Patients Attending Ophthalmology OPD of a Tertiary Care Hospital

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ABSTRACT

BACKGROUND
Glaucoma is characterized by the progressive and irreversible loss of vision due to damage to the optic nerve. If left untreated it can lead to complete blindness. The management of glaucoma involves controlling the disease process to minimize the damage to the optic nerve, an essential part of which is early diagnosis and early treatment. The symptoms develop so slowly that unless the patient is aware and has knowledge about the disease, its early diagnosis is very difficult. Heightened public awareness about glaucoma may increase the chance of identifying undetected cases early. We wanted to assess the awareness and knowledge about glaucoma in patients coming to ophthalmology OPD of a tertiary care hospital in this study.

METHODS
This was a cross-sectional study conducted for one month among patients aged 18 years and above. A total of 205 patients were randomly selected from the ophthalmology OPD. A questionnaire was given to each patient and the responses were noted. Based on the responses given by the patients for each question, scores were given, and a conclusion was drawn. It was cross-analysed with the patient's demographic data.

RESULTS
Among the subjects, 109 (53.17 %) were males and 96 (46.8 %) were females. Out of 205 subjects, only 144 (70.2 %) subjects had heard of the term glaucoma. There were statistically significant differences between different age groups and their awareness of glaucoma (P < 0.001). Yet only 33.9 % had accurate knowledge of the disease.

CONCLUSIONS
Awareness and knowledge of glaucoma are low. An efficient strategy needs to be designed to increase the awareness and knowledge levels of glaucoma.

KEY WORDS
Glaucoma, Optic Nerve, Early Diagnosis, Awareness, Knowledge
**BACKGROUND**

Glaucoma is a leading cause of vision-related morbidity worldwide, and the second leading cause of blindness in the world accounting for up to 8% of total blindness.\(^{[1]}\) In India, glaucoma is the leading cause of irreversible blindness with at least 12 million people affected and nearly 1.2 million people blind from the disease.\(^{[2]}\)

Glaucoma is an optic neuropathy of multivariate aetiology wherein intraocular pressure (IOP) is the most important and only modifiable risk factor.\(^{[3]}\) Accurate IOP measurement has a very important role in the diagnosis as well as management of glaucoma.\(^{[4]}\) In contrast, all other types of glaucomas are defined first and foremost by the presence of elevated IOP and not in reference to optic neuropathy that follows sustained elevated IOPs.\(^{[5,6]}\)

Glaucoma is a chronic disease that usually has no symptoms and the vision stays normal in its early stages. As the optic nerve damage starts, peripheral vision is lost progressively till only the central vision is left resulting in tunnel vision. Such peripheral loss of vision is a unique feature of glaucoma.\(^{[7]}\) Apart from the blurring of vision, there are other symptoms of glaucoma. Common risk factors include intraocular pressure above 21mm Hg, age over 40 years, history of glaucoma within the family, use of steroid-containing medications (eye drops/pills/inhalers/skin creams), those with higher refractive error (power) of the eyes, patients with a history of blunt eye injury, hypertension and diabetes.\(^{[8]}\)

There are mainly two types of glaucoma: first is primary open-angle glaucoma (POAG), and the second is angle-closure glaucoma, which occurs due to an increase of IOP or pressure inside the eye. On the contrary, when optic nerve damage has occurred despite a normal IOP, it is called normal-tension glaucoma.

Another condition, secondary glaucoma occurs when another disease causes or contributes to an increased IOP, which further results in optic nerve damage and vision loss.

Glaucoma has a multi-factorial aetiology and one of the most important and the only modifiable risk factor among them is the raised pressure of the eye. Even though raised intraocular pressure is a significant risk factor, having a normal intraocular pressure does not rule out the incidence of developing glaucoma. An abnormal drainage angle (at the junction of cornea and iris) is the most common abnormality of the eye leading to raised intraocular pressure. This abnormality of the angle obstructs the flow of the fluid which accumulates inside the eye and causes pressure on the optic nerve leading to progressive damage and loss of vision.\(^{[9,10]}\)

A glaucoma suspect is a person with an increased risk of developing glaucoma and glaucomatous optic nerve damage or degeneration, with one or more clinical features.\(^{[9]}\) However, not all patients who are glaucoma suspect develop glaucomatous optic nerve damage and/or visual field loss. Overall, about 1% of individuals with ocular hypertension develop glaucoma per year.\(^{[10]}\)

The changes seen during the disease happen over a period of time, glaucoma causes silent damage, thus warranting follow-up care, to exclude any progressive change over time.

Left untreated, patients with optic nerve damage may progress, resulting in gradual loss of peripheral vision and eventually total optic nerve atrophy and irreversible blindness.\(^{[11]}\)

Early diagnosis and treatment of glaucoma help in delaying the progression of the disease and improving its prognosis. This was shown in the early manifest glaucoma trial (EMGT), in which early treatment and a 25% decrease in IOP in patients with early and newly diagnosed glaucoma reduced and delayed glaucoma progression over six years from 62% in the untreated group to 45% in the treated group.\(^{[12]}\)

Eye health education that influences people to participate in regular ophthalmologic care may be an important step to detecting glaucoma early, thereby preventing irreversible blindness. Alongside, education and preventive eye care will also help in reducing the economic burden of the disease in society. There's no cure for glaucoma, but early diagnosis followed by early treatment can often stop or minimize the damage and protect the vision.\(^{[9]}\)

We wanted to assess the awareness and knowledge about glaucoma in patients coming to ophthalmology OPD of a tertiary care hospital in this study.

**METHODS**

This cross-sectional study was conducted in the Department of Ophthalmology of a tertiary care hospital. A total number of 205 patients attending the ophthalmology OPD were randomly selected for the study, over 30 days.

The portion of patients diagnosed with glaucoma was noted to be 5%. The sample size was calculated to be n=205 by using the formula:

\[
n=Z_{α/2}^2 * P (1-P)/d^2
\]

Where, \(Z_{α/2}\) is the critical value of the normal distribution at \(α/2\) (For our study, the confidence level was 95%, \(α\) was 0.05 and the critical value was 1.96), \(P=95\%\) was the prevalence and \(d=5\%\) was the margin of error.

The inclusion criteria included adult patients in the age group of 18 and above of both genders who were not already diagnosed cases of glaucoma or ocular hypertension.

The exclusion criteria included patients who were already clinically diagnosed with glaucoma or on any topical anti-glaucoma drugs, patients who were blind, or had predisposing conditions like trauma to eyeball or uveitis and those having developmental glaucoma or optic nerve damage.

After obtaining consent from the patient, a questionnaire was translated to the patient’s knowledge. The questionnaire was adopted from a similar study done on awareness of glaucoma among residents of North India by Rewri et al. and validated by a group of ophthalmologists and experts in Community Medicine.\(^{[13]}\)

The Questionnaire had Three Sections

The first section contained questions to procure the demographic information of the patient. The second section pertained to the patient’s awareness and knowledge about
glaucoma through 10 questions. The initial four questions evaluated their awareness and the next six questions were used to assess their knowledge of glaucoma. The third section had two questions dealing with their source of information and if the patient underwent any ocular screening or eye check-up in the past one year. The respondent had to tick the response of their choice. The protocol of the present study was approved by the Research and Ethics Committee vide letter no. BMHR-IECCMCL/0322-102.

Statistical Analysis
The data were entered into a Microsoft Excel sheet. The categorical data were represented as count (percentage) and continuous variables were represented as Mean +/- SD or Median (IQR) variables. To find the association between categorical values, the chi-square test was used, and a P-value of < 0.05 was considered significant. Statistical analysis was performed using SPSS version 26.

RESULTS
The questionnaire was administered to a total of 205 patients and their answers were analysed, of which 109 (53.17%) subjects were males and 96 (46.8%) were females.

The mean age of the patients was 49.08 years (SD, 16.14; Range, 16-79).

There were no significant statistical differences between gender and yearly ocular screening, (P > 0.05) and gender and their awareness of glaucoma (P > 0.05).

There were statistically significant differences between different age groups and their awareness of glaucoma (P < 0.05). Yet only 33.9 % had accurate knowledge of the disease. Table 1 shows the frequency and percent distribution of awareness and knowledge of glaucoma among subjects. Out of 205 subjects, only 144(70.2 %) subjects had heard of the term glaucoma. Out of the total number of patients, 117 (57.1%) of them thought that the risk of glaucoma increased with age, similarly only 88 (42.9%) and 92 (44.9%) patients thought that glaucoma caused permanent blindness and that treatment was possible for glaucoma, respectively. The frequency of familial predisposition and the asymptomatic course was on the lower side of 38 (18.5%) and 29 (14.1%) respectively.

More than half of the sample size considered glaucoma and cataract to be the same. Also, it was seen that only 43 (21%) patients underwent ocular screening in the past one month.

Among 205 study subjects, only 144 (70.2 %) participants were aware of the term glaucoma out of which 71 (48 %) were females and 75 (51.3 %) were males (Figure 1).

![Percentage of Study Subjects](image)

Figure 1. Awareness of Glaucoma

![Knowledge and Awareness of Glaucoma](image)

Figure 2 shows the knowledge and awareness of study subjects who had heard the term “glaucoma” at the time of the study based on specific questions asked about glaucoma.

![Source of Information](image)

Figure 3. Source of Information

On asking about the source of information about glaucoma, 45(30.82%) knew about it from TV/Radio/Newspapers, 60 (41.1%) from Hospital/eyecamp/health personnel, and the rest 41 (28.1%) knew about glaucoma from family/friends/relatives (Fig 3.)
Table 2 shows awareness comparison across different age groups and was found to be significant (P < 0.05).

<table>
<thead>
<tr>
<th>Entry</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
<th>Chi square</th>
<th>p-value</th>
</tr>
</thead>
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<td>&lt;40 years</td>
<td>35</td>
<td>34</td>
<td>69</td>
<td>20.933</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>41-60 years</td>
<td>58</td>
<td>19</td>
<td>77</td>
<td></td>
<td></td>
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<tr>
<td>&gt; 60 years</td>
<td>51</td>
<td>10</td>
<td>61</td>
<td></td>
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<tr>
<td>Total</td>
<td>144</td>
<td>61</td>
<td>205</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Awareness across Different Age Groups

Table 3 shows awareness comparison across gender and was found to be not significant (P > 0.05).

<table>
<thead>
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<th>Total</th>
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<tbody>
<tr>
<td>Female</td>
<td>76</td>
<td>26</td>
<td>102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>74</td>
<td>35</td>
<td>109</td>
<td>0.617</td>
<td>0.432</td>
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<tr>
<td>Total</td>
<td>144</td>
<td>61</td>
<td>205</td>
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</table>

Table 3. Awareness among Gender

Table 4 shows the relation between gender and the number of patients who underwent ocular examination/screening. However, no significant relationship between the gender and the number of patients who underwent ocular screening was seen (P > 0.05).

<table>
<thead>
<tr>
<th>Screening</th>
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<th>Female</th>
<th>Total</th>
<th>Chi square</th>
<th>P-value</th>
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</thead>
<tbody>
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<td>Yes</td>
<td>29</td>
<td>23</td>
<td>43</td>
<td>1.203</td>
<td>0.548</td>
</tr>
<tr>
<td>No</td>
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<td>47</td>
<td>101</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>35</td>
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<tr>
<td>Total</td>
<td>108</td>
<td>96</td>
<td>204</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Ocular Screening among Gender

**DISCUSSION**

Although the emphasis is laid more on cataracts, studies have shown that untreated glaucoma leads to irreversible blindness in developing nations. Since glaucoma may be associated with advancing age, an increase in life expectancy will lead to more elderly patients with glaucoma. Our study was conducted in a tier-3 tertiary care hospital. In our study, 70.2 % of subjects were aware of glaucoma, which appears higher than that found in rural (0.33 %) South India and urban Hyderabad (2.4 %).[14] Since this study was carried out in a tertiary care hospital, it may explain the higher percentage of awareness among the patients visiting OPD.

Rewri et al. in the year of 2014 surveyed glaucoma in North Indian rural residents. The survey concluded that there was a lack of awareness about glaucoma among them.[13,15] Another study was conducted by Sathyamangalam et al. to find out the determinants of glaucoma awareness and knowledge in urban Chennai. The survey findings stressed the need to spread awareness about glaucoma for the prevention of glaucoma-related blindness.[16]

In our study, awareness with respect to age was significant and it was seen that awareness among the age group < 40 years was only 50.7 %, with a p-value < 0.05. There was also a low awareness tendency among women. This is in accordance with a similar study conducted by Sathyamangalam et al. where it was seen that subjects in the age group of 60-79 years were 2.7 to nearly 3 times more likely to be aware of glaucoma when compared to 40-49 years old, hence increasing the awareness and knowledge in patients less than 60 years old as the population of the elderly group is increasing, the incidence of glaucoma is bound to increase.[14]

While assessing the knowledge of the disease among patients, it was seen that 67(46.5 %) subjects thought glaucoma to be the same as cataract, which might explain the increased subject awareness in this study initially. It is widely accepted that cataracts and glaucoma are among the leading causes of reduced visual acuity in any ophthalmology OPD. The development of cataracts signifies a loss in the transparency of the human crystalline lens which is usually age-related. However, cataract has a vast aetiology. On the other hand, glaucoma has broadly been described as a group of diseases with or without an increase in intraocular pressure, changes in the visual field and changes in the normal disc-cup ratio. It can be generalized that cataract requires surgical management whereas the treatment modality of glaucoma is to halt the progression of the disease with medications. Hence, educating the general public on the differences between glaucoma and cataract is necessary and providing information on the difference in treatment options and their prognosis and how will it affect the vision is a must in reducing the progression of glaucoma to the irreversible loss of vision state.

Only 38(18.5 %) individuals thought of glaucoma to have a familial predisposition. This level of knowledge is less than many of the previous studies conducted. The Baltimore Eye Survey found that the relative risk of having glaucoma is increased 3.7 fold for individuals who have siblings with POAG.[17]

Another finding in our study was that there was no significant gender difference in terms of screening and yearly eye check-ups. However, only 43(21 %) patients underwent ocular screening in the past one year. Lim et al. found that 2.6 % of normal-tension glaucoma suspects progressed to glaucoma per year, with higher baseline IOP and thin average retinal nerve fibre layer being risk factors for progression, thus suggesting how important regular eye check-up and screening is, especially in glaucoma suspects.[18]

It was seen in our study that the major source of information was hospital/eye-camp/health personnel. This supports our study, as the majority of subjects in the age group > 60 years had visited a doctor for cataracts and other medical conditions, thus gaining awareness about glaucoma. This differs from other studies where media was the main source of information in rural areas and friend/family was the major source in the urban population.

**CONCLUSIONS**

From our study, we concluded that there needs to be a strategic plan to increase the knowledge and awareness of the disease, its prognosis and its management. Early detection of this condition is essential in preventing vision loss and blindness. Since glaucoma usually presents no symptoms and warning signs until it is too late, spreading awareness and knowledge about the disease is critically important. The emphasis needs to be on the early diagnosis of the disease process, thereby initiating timely management, to limit its progression.
Limitations
This was a hospital-based study among patients visiting the OPD and not a community-based study including the rural subjects. The community-based studies may yield much lower awareness and knowledge proportions as the rural public have much less contact with the glaucoma patients.

There were many eye camps and awareness programs conducted for comprehensive eye care, which explains a fair proportion of awareness among individuals. However, it is seen that the knowledge about a potentially blinding condition like glaucoma remains low.

It is important to increase the awareness and knowledge of glaucoma as well as the consequences of its delayed treatment among the general public in a language which the target individuals understand.

REFERENCES