Prevalence and Risk factor for normal tension glaucoma in Al-Sadder teaching hospital, Amara city, Iraq.

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Abstract

**Background:** Glaucoma is a worldwide irreversible leading cause of vision loss. The most important risk factor for development of glaucoma is Intraocular pressure. One of the progressive optic neuropathy that mimics primary open-angle glaucoma is Normal tension glaucoma (NTG).

**Objective:** To determine the glaucoma prevalence and risk factors.

**Methods:** Our study was carried out in Al-Sadder teaching hospital during the period from September 2018 to September 2019. It included 186 patients diagnosed as glaucoma. Diagnosis was made by ophthalmologist on clinical history and examination.

**Result:** The study was found that 120 of the cases were having Intra-ocular pressure more than 21 mmgh while 66 cases having Intraocular pressure equal or less than 21 mmgh. most of cases (153) were aged more than 45 year, 108 (70.5%) cases of them were having Intra-ocular pressure more than 21 mmgh, there were 111 of cases were males, about 63 (57%) cases of male were having intraocular pressure more than 21 mmgh, 81 cases having positive family history. the present study found that 45 cases having hypertension and 27 cases with diabetes. There were 66 , 30 cases having myopia, cataract respectively. Regarding treatment; most of cases 138 treated without surgery. there was a statistical significant relationship between intra-ocular pressure and age, gender, family history, systemic disease and ocular diseases (p value was 0.0001, 0.007, 0.001, 0.008 and 0.001) respectively.

**Conclusion:** Glaucoma is more prevalent in people aged >45 years. Glaucoma is more common in patient with positive family history, a history of systemic disease and ocular diseases and there was a statistical significant association.

**Keyword:** glaucoma, prevalence, risk factors, Amara, Iraq


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Introduction

Glaucoma is have an effect on eye as neurodegenerative condition that associated with increased intraocular pressure (IOP). When left the without treatment untreated the patients may experience visual field loss, and may be lose the vision completely. It is consider as 2nd leading blindness cause overall the world. Glaucoma defined as a disease which causes progressive neuropathy in the optic field that lead to change in head or disk of optic nerve which may cause visual field defect in patients.(1)
The progressive optic neuropathy is caused by normal-tension glaucoma similarly to primary open-angle glaucoma, but statistically, the normal-tension glaucoma does not come with intraocular pressure (IOP) outside the normal range (2).

Intraocular pressure is one of the many serious risk factors for development of glaucoma, but patients can develop glaucoma with normal level of intraocular pressure if other risk factors are present (3).

Risk factors include: the Age (which is more common in elderly). Gender, (glaucoma higher in females than males). Family history, (the prevalence of glaucoma is greater in patients with positive family history than in the normal population). Also, the glaucoma is more in patients with systemic diseases such as diabetes and hypertension. Myopia is more associated with glaucoma and its progression (1).

The reducing of glaucoma progression is associated with lowering of IOP in most patients. However, about 50% of patients without treatment not deteriorate so the cases of glaucoma should be demonstrated before starting treatment, unless there is threatening to vision field, damage or young age due to advanced glaucomatous (4). Effectively, we need to use different treatment or medications to control glaucoma and intraocular pressure effectively (3). The surgery method is meant to manage glaucoma when there is progression despite the low IOP. The indication of surgery is likely to be used in order to reduce the IOP (5).

In order to reduce perfusion of optic nerve, the control of systemic disease such as diabetes, and hypertension may be important. By some authorities, the calcium-channel blockers been used to address vasospasm (1).

**Patients and Materials**

This is a cross-sectional study with analytic element conducted on 186 patients of different age group and different social background were attending the department of ophthalmology in Al-Sader teaching hospital in Missan city during the period from September 2018 to September 2019 and the data were collected from direct interview with patients.

Diagnosis was made by ophthalmologist on clinical history and examination. Interviews with the patients were done using a questionnaire designed by the researchers based on the standard criteria and data collected individually at the time of the diagnosis. Each patient underwent a detailed eye examination. This examination followed by dilated fundoscopy. The study has been approved and official permitted from local authority. Data were presented in form of tables of numbers and percentage. By using SPSS-20.0 the data were analyzed, for significant testing has been used Chi-square test ($\chi^2$-test). Statistically, the significance was considered when the P-value was $\leq 0.05$. 

**Result:**

There were 186 patients who met the criteria of glaucoma when attended the ophthalmology department of Al-Sader teaching hospital during the period from September 2018 to September 2019. The patients were classified according to the Intra-ocular pressure measuring level, 120 of the cases were having intra-ocular pressure more than 21 mmgh while 66 cases having intraocular pressure equal or less than 21 mmgh. (figure 1.)
The present study was found that most of cases (153) were aged more than 45 year, 108 (70.5%) cases of them were having Intra-ocular pressure more than 21 mmgh, there were 111 of cases were males and 75 were females, 57(76%) of female cases were having intraocular pressure more than 21 mmgh while 63 (57%) cases of male were having intraocular pressure more than 21 mmgh (table 1), according to family history our study showed that 81 cases having positive family history, 51 (63%) out of them with intraocular pressure less than 21 mmhg, while 105 cases had negative family history most of them having intraocular pressure more than 21 mmhg (table 1), also the present study were found that 87 cases having positivesmoking history, 51(59%) of them with intraocular pressure more than 21mmgh. while 99 cases with nonsmoking history, more than tow third of them having intraocular pressure more than 21 mmgh. as shown in table 1.

Table 1: patient characteristics distribution according to the Intra-ocular pressure measurement.

<table>
<thead>
<tr>
<th>Intra-ocular pressure</th>
<th>&gt; 21 mmgh No. (%)</th>
<th>≤ 21 mmgh No. (%)</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 45</td>
<td>12 (36)</td>
<td>21 (64)</td>
<td>33</td>
<td>0.0001</td>
</tr>
<tr>
<td>&gt; 45</td>
<td>108 (70.5)</td>
<td>45 (29.5)</td>
<td>153</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>63 (57)</td>
<td>48 (43)</td>
<td>111</td>
<td>0.007</td>
</tr>
<tr>
<td>Female</td>
<td>57 (76)</td>
<td>18 (24)</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>51 (59)</td>
<td>36 (41)</td>
<td>87</td>
<td>0.1</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>69 (70)</td>
<td>30 (30)</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>Family history</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>30 (37)</td>
<td>51 (63)</td>
<td>81</td>
<td>0.001</td>
</tr>
<tr>
<td>Negative</td>
<td>90 (86)</td>
<td>15 (14)</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>120 (65)</td>
<td>66 (35)</td>
<td>186</td>
<td></td>
</tr>
</tbody>
</table>
Regarding the disc cupping; 90 cases was presented with severe disc cupping (0.8-1), 57 out of them having intraocular pressure more than 21 mmHg, while 63 cases with moderate (0.5-0.8) and 33 cases of mild (0.2-0.5) the present study found that 45 cases having hypertension and 27 cases with diabetes while 42 cases having both hypertension and diabetes. the rest cases 72 having non systemic illness. one third of cases with hypertension having intraocular pressure more than 21mmgh that was in reverse in diabetes cases.There were 66 , 30 cases having myopia, cataract respectively, 42 cases of myopia and 12 cases of cataract having intraocular pressure more than 21mmgh.

Regarding treatment; most of cases 138 treated without surgery,90 cases of them having intraocular pressure more than 21 mmHg, while only 39 having surgically interference. as in table 2.

Table 2: risk factors and treatment distribution according to the intra-ocular pressure

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Intra-ocular pressure</th>
<th>TOTAL</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 21mmgh</td>
<td>≤ 21mmgh</td>
<td></td>
</tr>
<tr>
<td>Disc cupping</td>
<td>Mild (0.2 - 0.5)</td>
<td>21(63%)</td>
<td>12 (37%)</td>
</tr>
<tr>
<td></td>
<td>Moderate (0.5 - 0.8)</td>
<td>42 (67%)</td>
<td>21 (33%)</td>
</tr>
<tr>
<td></td>
<td>Severe (0.8 - 1)</td>
<td>57 (63%)</td>
<td>33 (37%)</td>
</tr>
<tr>
<td>A systemic disease</td>
<td>Hypertension</td>
<td>15 (33%)</td>
<td>30 (67%)</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>18 (67%)</td>
<td>9 (33%)</td>
</tr>
<tr>
<td></td>
<td>Both Hypertension + Diabetes</td>
<td>33(79%)</td>
<td>9 (21%)</td>
</tr>
<tr>
<td></td>
<td>No systemic illness</td>
<td>54 (75%)</td>
<td>18 (25%)</td>
</tr>
<tr>
<td>Ocular diseases</td>
<td>Myopia</td>
<td>42 (64%)</td>
<td>24 (36%)</td>
</tr>
<tr>
<td></td>
<td>Cataract</td>
<td>12 (40%)</td>
<td>18 (60%)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>6 (40%)</td>
<td>9 (60%)</td>
</tr>
<tr>
<td></td>
<td>No associated</td>
<td>60 (80%)</td>
<td>15 (20%)</td>
</tr>
<tr>
<td>Treatment</td>
<td>Medical</td>
<td>90 (65%)</td>
<td>48 (35%)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>24 (62%)</td>
<td>15 (38%)</td>
</tr>
<tr>
<td></td>
<td>Compensation</td>
<td>6 (67%)</td>
<td>3 (33%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>120 (65%)</td>
<td>66 (35%)</td>
</tr>
</tbody>
</table>

Regarding the association between the intra-ocular pressure measuring and study variables, the present study revealed that there was a statistical significant association between intra-ocular pressure and age, gender, family history, systemic disease and ocular diseases (p value was 0.0001, 0.007, 0.001, 0.008 and 0.001) respectively, while the other variable, smoking, disc cupping and treatment had no significant relationship with intra-ocular pressure (p value was 0.1, 0.9, and 0.9 respectively). As shown in table (1 and 2)
Discussion

Glaucoma is one of a neurodegenerative causes that is associated with increasing IOP and affects the vision. Without treatment of glaucoma the visual field loss gradually, globally. It is the second leading cause of blindness.(1)

The result of our study was found that 65% of the glaucoma patient were having Intra-ocular pressure more than 21mmhg, while 35% having Intraocular pressure less than 21mmgh, this result was in agreement with other study which found that the intraocular pressure were high in most of patient with glaucoma (6). while other study carry out in Korea were showed that most of cases had less than 21mmgh (7).

Most of the glaucoma patients who included in present study were their age over forty -five year, about two third of them were having Intra-ocular pressure more than 21 mmgh. the study that conducted in it was found similar result.(8)

Although of the glaucoma were more in male than females, but Intra-ocular pressure more than 21 mmgh was high in female than male with a statistical significant association, there were a Several studies have shown conflicting results; while some showed higher IOP in males(9,10) others showed higher values in females and some showed no association (11). It has been hypothesized that the higher IOP in men could be due to a higher prevalence of cardiovascular risk factors in men (12).

A family history of glaucoma having a positive statistical significant association in our study result. this in agreement with other study(13, 14) With regards to family history of glaucoma it was observed that first degree relatives of PCAG patients have a greater chance of developing glaucoma compared to other types. (15)

The current study was found that about half of glaucoma cases were smoking, Although of this there was no a statistical association. A few studies have shown a positive association between smoking and glaucoma (16, 17), while no association was found in population-based studies (18,19)

Regarding the disc cupping; about half of our study cases was presented with disc cupping most of them having intraocular pressure more than 21 mmhg, in spite of no significant association between cupping of disc and glaucoma. There are a Several studies have indicated that disk cupping is a risk factor for glaucoma progression (20, 21).

While some recent experimental studies have shown that no disc cupping association in response to glaucoma (22, 23)

There were a significant association between DM, HTP and glaucoma that was found in our study, about 24% and 14% of glaucomatous patients having hypertension and diabetes respectively, most of them were having intraocular pressure more than 21mmgh, a similar result was obtain from other studies(24, 25, 26,27)

Ocular diseases has been found to be a significant risk factor for glaucoma in present study. In addition, suggests that risk of development and progression of glaucoma increases with the degree of ocular disease such as myopia. Many studies has shown the same result (28,29,30,31,32, 33). Most of glaucoma cases treated were treated medically without need for surgery interference in which a good prognosis has been achieved. Recent research has shown that the choice of medications may be important in the overall prognosis of these patients as well,(2,34,35) but When medications are unable to
achieve adequate stability of progression, glaucoma surgery remains the most proven option in the treatment (36, 37,38).

Conclusion

In our study we concluded that glaucoma is more prevalent in people aged >45 years, also it is associated with positive of family history, systemic disease such as hypertension, diabetes or other vascular diseases and in those who have other ocular disorders such as myopia and cataract.

Reference


