

Correlation of Hypertension in Glaucoma in Tertiary Care Centre

Dr, Somesh Ranjan^{1*}, Dr. Shikha², Dr. Nidhi Raghav³, Dr Shivang⁴, Dr Sarita⁵

^{1*,2,3,4,5}Santosh Medical College and Hospital, Santosh Deemed to be University, Ghaziabad

Corresponding Author : ^{1*}Dr, Somesh Ranjan

ABSTRACT

Background: Glaucoma is regarded as an optic neuropathy that causes vision loss and is typically asymptomatic until advanced stages. The objective of this study was to determine if patients with primary open-angle glaucoma experienced systemic hypertension (POAG).

Methodology: Patients which were known cases of glaucoma and age >40 years, taking regular drugs or receiving anti-glaucoma therapy were included in the study. The measurement of intraocular pressure was made using Goldmann tonometry.

Result: There were 61 males and 53 females out of 114 POAG patients in the study. Out of 61 males 72.1% had hypertension whereas 49.1% out of 53 females hypertension. A Highly significant association was observed between hypertension and IOP.

Conclusion: There was no major correlation between fundamental hypertension and IOP expansion. There was no clear correlation with systemic hypertension in any of the other clinical and diagnostic measures of POAG.

Keywords: Glaucoma, intraocular pressure, hypertension

1. INTRODUCTION

Glaucoma is the world's second most common cause of blindness and accounts for 15 percent of global blindness. In India (23.5 percent) of global blindness, the regional blindness burden is largest, with at least 5.8 million blind due to Glaucoma. It accounts for at least 12.9 percent of the world's primary open angle Glaucomatous blindness in India, and these estimates are projected to be double the amount today by 2020A.D.[1] While it predominantly affects the elderly age group, glaucoma occurs at all levels of our society, with a substantial economic effect on health. Glaucoma causes permanent visual loss, no known therapy can recover the vision lost. However, blindness is preventable from glaucoma in all cases; early diagnosis and careful management are needed for this prevention. Diagnosis relies on the capacity of multiple glaucoma to detect early clinical signs. Open-angle glaucoma is caused by multiple components and very few variable risk factors, such as systemic blood pressure. Hypertension is one of the modifiable risk factors that can be adjusted to avoid the development of glaucomatous optic atrophy. There is a disturbance of the pressure in the choroidal arteries supplying the optic disc and the retrolaminar portion of the optic nerve, resulting in vascular insufficiency in the optic disc and the retro-laminar part of the optic nerve, as well as visual field defects and pathological diseases.[2] By 2010, the overall prevalence of 1.96 percent was estimated to represent 44.7 million people affected by POAG and 4.5 million were expected to be bilaterally blind.

Glaucoma was used to characterize blindness by advancing age to explain by Hippocrates. Increased occurrence of primary open angle glaucoma that is considered to have hypertension, hypotension, coronary artery disease etc [3] in patients with systemic vascular diseases is seen as Al-Tabari [10th century], which is written in Arabic script in his book of Hippocratic care, the first concept of a disease with elevated IOP comparable to what is known as glaucoma. Open-angle glaucoma patients have been shown to have elevated blood pressure [3]. Several studies have shown that there is no significant intraocular pressure diversion in the general population of patients with systemic hypertension.[4]

2. METHODS AND MATERIALS

The present Interventional study was carried out in the Department of Ophthalmology, Santosh Medical College and Hospitals, Ghaziabad, UP after getting approval of the Institutional Ethical committee over the period from January 2019 to July 2020. Details of the procedure were explained to all the patients and written informed consent was taken. This study comprised 114 POAG-diagnosed participants who were over 40 years old.

Patients were selected on the basis that they were already diagnosed cases of glaucoma and was on regular medications or anti-glaucoma therapy for glaucoma. As we know glaucoma is a group of degenerative disease in this study patient already knew about their diagnosis about glaucoma. So, we had selected those patients who were above 40 years of the age and had glaucoma and were inform about the nature of the study.

3. RESULTS

A total of 114 patients meeting the inclusion criteria were enrolled in the study. All subjects were POAG patients of which 70 patients had hypertension. There were 61 males and 53 females in the study whereas the mean age was 57.74 ± 10.64 years.

Table 1: Age and sex distribution of POAG

Age	SEX		Total
	Male	Female	
40-49 years	16 (26.2%)	11 (20.8%)	27 (23.7%)
50-59 years	20 (32.8%)	16 (30.2%)	36 (31.6%)
60-69 years	16 (26.2%)	18 (34%)	34 (29.8%)
>70 years	9 (14.8%)	8 (15.1%)	17 (14.9%)
Total	61 (53.5%)	53 (46.5%)	114 (100%)

Table 1 describes the demographic characteristics according to age and sex of all participants during the study period. In this study, a total of 114 cases of POAG were included. Majority of males (20) were from 50-59 age group while higher number of females(18), were in the age group 60-69 years.

Table 2: Clinical characteristic of patients with primary open angle glaucoma

	Maximum	Minimum	Mean \pm SD
IOP (R/E)	17	35	26.16 \pm 4.62
IOP (L/E)	17	35	26.18 \pm 4.57
SBP	110	180	137.72 \pm 17.348

Table 2 showed clinical characteristic of POAG patients. The mean intra ocular pressure for right and left eye was 26.16±4.62 mmHg and 26.18±4.57 mmHg respectively. The mean systolic blood pressure was 137.72±17.348 mmHg ranging from 110-180 mmHg. Mean diastolic blood pressure observed among POAG patients was 80.53±8.07.

Table 3: Association between IOP and Hypertension among POAG patients

		Hypertension		p-value
		Yes	No	
IOP (R/E)	≤ 21 mmHg	1 (1.4%)	29 (65.9%)	<0.0001
	>21 mmHg	69 (98.6%)	15 (34.1%)	
IOP (L/E)	≤ 21 mmHg	2 (2.9%)	28 (63.6%)	<0.0001
	>21 mmHg	68 (97.1%)	16 (36.4%)	

Table 3 shows highly significant association between hypertension and intra ocular pressure among POAG patients.

4. DISCUSSION

The population should be screened for glaucoma to help identify cases early. The entire population may not be financially viable to screen, though. Identification of the risk factors will make it easier to choose high-risk patients for screening, which should lead to a general decline in the visual impairment caused by this illness and the morbidity associated with it.

Patients with primary open angle glaucoma who were seen at the outpatient department at Santosh Medical College, Ghaziabad, participated in this cross-sectional study. In this investigation, the presence of concomitant systemic hypertension in 114 patients with primary open angle glaucoma was assessed. In our study of 114 patients 61 were males and 53 females. Systemic hypertension was found in 70 of the 114 patients which amount to 61.4%. The average intra ocular pressure (IOP) for right eye among subjects was 26.16 mmHg and for left eye was 26.18 mmHg whereas the range of IOP being 17 – 35 mmHg with goldmanapplanation tonometry.

There is difference in relation between hypertension and glaucoma which are conducted in different places of the world and even in India. The prevalence of hypertension in glaucoma in is 61.4% percent which is comparable to studies done by **EgnaNeumarkt et al** [5], **Blue mountain et al** [6], **Latin eye disease** [7], **Mitchell et al** and **Baltimore et al** [8] who found the prevalence rate respectively 27.9%, 45.7% ,17% and 49.3%.

Accessible information recommends that the commonness of POAG shifts from competition to race and is affected by different variables like age, sexual orientation, and other related danger factors. The prevalence assessed for POAG in East Asia differs from 0.5% to 2.3% and from India is between 0.41% to 2.56%. [9]

In our study, the total number of male subjects was 61 out of 114, which corresponds to 53.5% prevalence in males and 53 out of 114 were females, which accounts for 46.5% among females. In proportion to increased blood pressure, the mean intraocular pressure increased. A positive association between I.O.P. and POAG was suggested in the Blue Mountains eye study [6]. It showed a 3mm linear increase in I.O.P across the range of blood pressure levels, as seen in the graph.

There was also no major gender difference between patients with and without POAG in

population-based studies conducted in rural [6] and urban south India [10] and in Central India [11]. The study of blue mountain eye disease showed a higher prevalence of POAG in women than in men, [12] and similar results were seen in the study of Andhra Pradesh eye disease, [10], where the chances of women with POAG were 1.3 (95% CI, 0.7, 2.6), although this was not statistically important. This was contrary to other research, such as the Aravind Comprehensive Eye Survey [9] and the analysis conducted in Barbados by Leske et al [21], which showed that POAG was more likely for males.

In our sample, there was no statistically significant association between systemic hypertension and the incidence of POAG ($p=0.81$), which is consistent with results from the Barbados eye study [13], the Weih et al [14] study, and the Aravind eye survey [37]. This was contrary to some population-based research, such as the 11th Blue Mountain eye study [6], the 15th Egna-Neumarkt study [5], and the 47th Baltimore eye study [8].

Conclusion: POAG is multi-factorial and has distinct hazard variables. It has a vague relation to basic hypertension, and this has been tested in this investigation. No vital interaction with POAG or any of the numerous clinical and symptomatic markers of POAG was found to have fundamental hypertension.

There was no major correlation between fundamental hypertension and IOP expansion. These results were not exactly the same as those that occurred in a large number of other population-based reviews carried out in various nations, but were like the findings contained in India's considerations.

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