Original Article

Frequency of primary open angle glaucoma in Abbasi Shaheed Hospital

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Abstract

Objective: To determine the frequency of Primary Open-Angle Glaucoma in different age groups. Early diagnosis of Primary Open Angle Glaucoma can prevent irreversible damage to vision.

Methods: This cross sectional study was conducted at the Abbasi Shaheed Hospital, Karachi from 2005 to 2006. A total of 149 glaucoma patients between the age groups of 30 to 70 years were included. Primary Open Angle Glaucoma was diagnosed on the basis of glaucomatous optic nerve damage, abnormal visual fields and optic disc cupping with or without elevated intra ocular pressure with open-angle on gonioscopy SPSSv.8 was used for data entry and descriptive analysis.

Results: The total patients in less than 40 years of age group were 2 (1.34%), in 41-50 years age group were 29 (19.46%), in 51-60 years of age group were 47 (31.54%), and in 61-70 years age group were 71 (47.65%).

Conclusion: The results show that there is a high frequency of primary open angle glaucoma among people over age of fifty years. Therefore this population in particular, should be monitored carefully for open angle glaucoma, as early diagnosis and therapy may decrease visual morbidity.

Keywords: Open angle glaucoma, Frequency, Karachi, Age (JPMA 61:778; 2011).

Introduction

Glaucoma constitutes a group of disorders with diverse pathogenesis associated with an elevated intraocular pressure in majority of the cases with characteristic pattern of optic neuropathy and loss of visual field. It is one of the leading causes of blindness worldwide. Although the number of people having glaucoma varies in different countries, it is estimated that approximately 66.8 million people are affected worldwide, out of which 6.6 million are blind.[1] Out of them, Primary Open Angle Glaucoma is the most common type of glaucoma, accounting for 90% of all cases.[2]

Primary Open-Angle Glaucoma is a multi-factorial optic neuropathy that is chronic and progressive with characteristic acquired loss of optic nerve fibers. Such loss develops in the presence of open anterior chamber angles, characteristic visual field abnormalities and intraocular pressure that are too high for the continued health of the eye. It manifests by cupping and atrophy of the optic disc, in the absence of other known causes of glaucomatous disease.[3]

The exact cause of Primary Open-Angle Glaucoma is not known, although many risk factors have been noted. Identifying risk factors is important because this information may lead to the development of strategies for disease screening and prevention and may be useful in identifying persons for whom close medical supervision is indicated. Besides increased Intra ocular pressure, factors known to be associated with an increased risk for the development of glaucoma include advanced age, decreased corneal thickness, racial background, and a positive family history. Data also support Myopia, Diabetes mellitus,[4] and arterial hypertension,[5] Some studies consider that males are 3

times more likely to develop Primary Open-Angle Glaucoma than females.[6] The disease itself is not limited to only middle-aged and elderly individuals. The age specific prevalence of Primary Open-Angle Glaucoma reported by various investigators showed that Primary Open Angle Glaucoma is more among people over 60 years of age.

Primary Open-Angle Glaucoma is largely asymptomatic; patients may be unaware until irreversible damage has occurred. Hence patients may need to proactively determine that which patients are at a high risk of developing Primary Open-Angle Glaucoma. Early diagnosis in conjunction with a properly managed treatment regime is associated with preventing further Primary Open-Angle Glaucoma progression.

This study was conducted to observe the prevalence of Primary Open-Angle Glaucoma in different age groups of patients in a public sector hospital of Karachi.

Patients and Methods

This cross-sectional study was based on convenience sampling of two hundred patients conducted in the outpatient department of ophthalmology, Abbasi Shaheed Hospital (ASH), Karachi from March 2005 to March 2006. Sample size calculation was done as it was a hospital based study and duration of the study was fixed. Patients between 30 to 70 years of age were included who were confirmed as POAG by clinical and diagnostic procedures. Patients below 30 years of age, angle closure glaucoma, secondary glaucoma or any other diseases in the eye were excluded .

Patients were selected from Out Patient Department of Ophthalmology, Abbasi Shaheed Hospital, according to inclusion criteria.

Informed written consent was taken. A total of two hundred glaucomatous Patients were registered for the study in which one hundred and forty nine patients were diagnosed as Primary Open Angle Glaucoma by clinical and diagnostic procedures. The diagnosis of Primary Open Angle Glaucoma was based on fundus examination of each patient in detail to evaluate the glaucomatous optic nerve damage, optic disc cupping, the nerve fiber layer damage with the help of 90 D lens , direct ophthalmoscope and indirect ophthalmoscope ,with or without elevated Intra ocular pressure recorded in every case by Goldman's applanaton tonometer .Abnormal visual fields examined by automated perimetry and angle was examined on gonioscopy . For the study purpose they were divided into four different age groups, from A to D, that is group A (30-40 years of age), group B (41-50 years of age), group C (51-60 years of age), and group D (61-70 years of age).

Statistical analysis was done by SPSS version 8.0.Frequencies and percentages were calculated for gender, age groups and numbers of patients having POAG in that age group.

Results

A total of 200 cases of glaucoma were studied and evaluated according to designed Performa. Out of the 200 cases of glaucoma, 149 (74.9%) patients were diagnosed as primary open angle glaucoma. All 149 were divided into four age groups. There were 71 (47.65%) patients in group D (61 to 70 years). Group C (51 to 60 years) had 47 (31.54%) patients. In group B (41 to 50 years age) frequency of primary open angle glaucoma was 29 (19.46%) and 2 (1.34%) patients were enrolled in group A (30 t0 40 years age). There was no difference in gender distribution with 75 (50.33%) being females and 74 (49.66%) males.

Patients presenting with raised intra ocular pressure varied in different age groups. In age group A (30 to 40 years age) 2 patients i.e. 100% for the group. In group B (41 -50 years age) 14 (48.2%) patients were diagnosed as Primary Open Angle Glaucoma with raised intra ocular pressure. In Group C (51 to 60 years age), 35 (74.46%) patients were diagnosed as Primary Open Angle Glaucoma. In age group D (61 to 70 years age), 14 (42.25%) patients had raised intra ocular pressure.

Patients who did not have raised Intra ocular pressure were already using various pressure lowering drugs with good control and were referred for further management.

Other than Intra ocular pressure, diabetes and

Table: Risk factors of primary open angle glaucoma in different age groups.

Risk factors	30-40years	41-50years	51-60years	61-70years
Raised Intra ocular pressure	2	14	35	30
Family history of Primary Open Angle Glaucoma	1	4	6	7
Myopia	No	10	10	5
Diabetes mellitus		No	13	24
Hypertension		No	5	25
No risk factors		10	4	6

hypertension also play an important role for development of Primary Open Angle Glaucoma in older age group as they cause ischaemia, which is evident from the results. Twenty four (33.8%) patients had Diabetes and 25 (35.2%) patients were Hypertensive in Age group D (61-70 Years of age) as compared to age groups A and B where no systemic illnesses were found . Only 13 (27.6%) patients in age group C were suffering from Diabetes and 5 (10.63%) patients had Hypertension. Age therefore, again, becomes an increasingly significant risk factor with each decade.

The different risk factors for primary open angle glaucoma in different age groups shown in the Table.

Discussion

Primary Open Angle Glaucoma is the most prevalent of all glaucomas affecting approximately I in 100 of the general population over the age of forty years. It is largely asymptomatic, patients may be unaware until irreversible damage has occurred. Hence early identification of patients at high risk of developing Primary Open Angle Glaucoma is necessary. Early diagnosis in conjunction with a properly managed treatment regime is associated with preventing further Primary Open Angle Glaucoma progression and less number of patients with blindness.

The results of this study have been compared with the previous studies carried out by other researchers. In a study by M Kroese[7] in UK the incidence of Primary Open Angle Glaucoma in 30-40 years of age was 1.66%. But in another study by Ntim-Amponsah,[8] the prevalence of Primary Open Angle Glaucoma was found to be 18.76%. This suggests that onset of Primary Open Angle Glaucoma is earlier in blacks and emphasizes that it is not limited to those over 40 years of age. It also shows the need for applanation tonometry in all individuals old enough to permit.

In age group between 41-50 years of age, Kroese[7] reported 6.06%-19.46% in an international study carried out by Ntim-Amponsah.[8] The frequency was similar in our study, i.e. 19.46%. Jameela A Burney in a local study also reported 25% cases.[9]

The incidence of Primary Open Angle Glaucoma in 51-60 years of age group described by Kroese[7] was 10.60% while in the study of Ntim-Amponsah[8] it was 17.44% and 24% were found by John Landers.[9] A Burnery[10] who was working on relationship between diabetes mellitus with Primary Open Angle Glaucoma, found 30% prevalence in patients in the age group 51-60 years which is comparable to our study.

In an age group between 61-70 years, 15.45% was recorded by Ntim-Amponsah[8] and 19.63% by Kroese in UK.[7]

In a study of 154 patients of Primary Open Angle Glaucoma in Nigeria, Omali E[11] recorded the biggest incidence in seventh decade. Tuckky[12] reported 43.9% and John Landers[9] recorded 29%. Compared to the result stated above, in our study these percentages are quite high, that is 47.65%. This could be due to some patients being already on medication and late presentation.

It was observed that frequency of Primary Open Angle Glaucoma increases with age and patients above 50 years of age are at high risk for developing it. The reason could be that elderly people are more fragile and susceptible to injury or alternatively are more likely to have an elevated Intra ocular pressure longer and therefore to have more damage.[13] The causes are not known but may be related to reduced facility of aqueous outflow with ageing. The normal human trabecular meshwork undergoes several changes with age. The general configuration changes from a long wedge shaped to a shorter, more rhomboidal form.[14] The scleral spur becomes more prominent, the uveal meshwork becomes more compact and localized and closure in Schlemm canal becomes more common. This trabecular meshwork progressively thickens and the endothelial cellularity declines[15] at the rate of approximately 0.58% of cells per year,[16] occasionally leading to trabecular denuding. A decrease in the number of giant vacuoles was associated with a decrease cell count in Schlemm canal, although both vacuoles and cells decline is explained by an age related reduction in the size of Schlemm canal.[17] A narrowing of the inter trabecular spaces and an increase in extra cellular material especially of electron dense plaques are the juxta canalicular tissue, are also seen with increasing age.

It may also be related to an inadequate vascular perfusion of the intraocular portion of the optic nerve with increasing age or an imbalance between the level of the Intra ocular pressure and the level of vascular perfusion pressure of the optic nerve. Age therefore becomes an increasingly significant risk factor with each decade.

This in itself may be a pressure independent factor in that age related degenerative changes to the lamina cribrosa may lead to ganglion cell axon ischaemia or the loss of structural support. Furthermore with advancing age comes the increased risk of other causative factors for

Primary Open Angle Glaucoma e.g. systemic hypertension or diabetes mellitus. There is also increased time for these factors to damage blood vessels and retinal ganglion cells. Furthermore our results could be evidence of a pressure dependent mechanism; where by prolonged exposure to raised Intra ocular pressure could lead to Glaucomatous optic neuropathy.

The main limitations in our study were that, it was conducted in a single centre rather than multiple centers and duration of the study was fixed. Another important limitation in this study was that patients included in this study belonged to same ethnic background so we were unable to observe the effects on results due to ethnic variations.

Conclusion

The result of this study indicates that there is a high frequency of primary open angle glaucoma in age older than 50 years. The older age groups in particular should be monitored carefully. Primary open angle glaucoma is an asymptomatic condition so screening includes visual field examination, tonometry and ophthalmoscopy should be done from the age of 50 years .Therefore, and early diagnosis and therapy may decrease glaucoma's visual morbidity.

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