Original Article

Incidence of Primary Open Angle Glaucoma in Patients Presenting with Retinal Vein Occlusion

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Purpose: To determine the incidence of primary open angle glaucoma in patients presenting with Retinal vein occlusion in tertiary care hospital.

Study Design and Place of Study: Cross-sectional study.

Place and Duration of Study: Eye Unit II, Institute of Ophthalmology, King Edward Medical University, Mayo Hospital, Lahore. from January 2016 to December 2017.

Material and Methods: A sample size of 100 cases was calculated with 95% confidence level, 5% margin of error. Non-probability consecutive sampling was done. Adult patients of either gender presenting with retinal vein occlusion (RVO) diagnosed within a month were included in the study. The demographic information and Visual Acuity were recorded and a detailed slit lamp examination, gonioscopy and fundoscopy was carried out. Applanation tonometry for Intra ocular pressure (IOP) measurement was performed. Central corneal thickness was measured and the correction factor was applied. If there was raised Intraocular pressure (> 20 mm Hg), then patient was labeled as glaucoma. Data was collected and analyzed by SPSS. Data was stratified. Post stratification, Chi-square was applied.

Results: The mean age was 46.28 ± 15.02 years. On gender basis male were found more involved as ratio was 1.6: 1. The Mean intraocular pressure was 15.87 ± 4.52 mm Hg. Primary open angle glaucoma was found in 14 (14%) of patients.

Conclusion: Our Study concluded that the incidence of glaucoma is significant in patients presenting with Retinal vein occlusion (RVO) in local population.

Keywords: Primary Open Angle Glaucoma, Retinal Vein Occlusion, Intraocular Pressure.

Among the retinal vascular diseases Retinal vein occlusion (RVO) is the second common reason of vision loss after diabetic retinopathy[1]. Central and branch retinal vein occlusion are its two distinct types based upon site of occlusion. Its prevalence varies from 0.7% to 1.6% in different studies[2]. The pathogenies of acute RVO is still not well understood[3]. The natural history of RVO is variable, many patients have good prognosis with one study showing half of patients achieved 20/40 vision after 6 months without treatment[4]. Other causes of vision loss due to RVO include cystoid macular edema, neovascularization leading to vitreous hemorrhage, retinal detachment or glaucoma[5].

Glaucoma is a specific form of optic neuropathy causing irreversible blindness and second most common cause to blindness worldwide[6]. Relationship

between RVO and glaucoma has been well established since the start of the 20th century[1].

In one study the percentage of central retinal vein occlusion was 25% while for BRVO was 8.6% in diagnosed case of chronic simple glaucoma[7]. Hayreh reported prevalence of RVO among glaucoma was higher than normal population i.e. approximately 10%[5,8]. The Eye Disease Case-Control Study, in a large series of patients with RVO, found that in all types of RVO, history of glaucoma was found[9].

So, aim of this study was to find the incidence of glaucoma in patients presenting with RVO in a tertiary care Hospital. In RVO the comorbidity of glaucoma enhances the severity of RVO. Timely diagnosis and management can prevent patients from permanent vision loss. Literature has reported that in few cases of RVO glaucoma occurs, but some studies reported little higher incidence/prevalence.

Moreover, no local evidence was available regarding this issue which can discover the extent of glaucoma in RVO cases in local population, knowing the exact incidence can help in setting the guidelines for prevention of glaucoma in RVO cases.

MATERIAL AND METHODS

This observational study was conducted in Eye Unit II, Institute of Ophthalmology, King Edward Medical University, Mayo Hospital, Lahore for two years from Jan 2016 to December 2017. A sample size of 100 cases was calculated with 95% confidence level, 5% margin of error and taking expected % glaucoma 9.9% in patients presenting with retinal vein occlusion. Non-probability consecutive sampling was done.

Patients' age ranging from 18 to 70 years of either gender presenting with RVO diagnosed (history of loss of vision and fundoscopy show dilation and tortuosity of vein with retinal hemorrhages) within a month were included in the study. Patients with history of ocular trauma or surgery for glaucoma, previous corneal opacity and base line visual acuity of no perception of light (NPL) were excluded from the study. Patients were registered from Outpatient Department (OPD), an informed consent was taken. The demographic information like name, age, sex and address was recorded. Visual Acuity of all the patients was recorded by Snellen's visual acuity chart. A detailed slit lamp examination with fundoscopy carried out by 90D and 66D fundus lenses and gonioscopy was carried out with Goldman three mirror gonioscopy lens to confirm the diagnosis of retinal vein occlusion and primary open angle glaucoma. Examination of fellow eye was also carried out. All the patients then underwent applanation tonometry for the Intra ocular pressure measurement. Central corneal thickness was measured and the correction factor was applied. If there was abnormally raised Intraocular pressure (> 20 mm Hg), then patient was labeled as glaucoma as per operational definition of study. All the information was collected on a predesigned proforma. No ethical issue and risk was involved. Data was analyzed by SPSS version 17. The quantitative variable like age was presented as mean and standard deviation The Qualitative variable like gender and glaucoma were presented as frequency and percentage. Data was stratified for the age, gender and duration of RVO, history of Diabetes Mellitus and hypertension. Post stratification, Chi-square was applied taking p –value < 0.05 as significant.

RESULTS

The mean age was 46.28 +- 15.02 years among the patients. There were 62% male patients while 38% female patients (Figure 1).

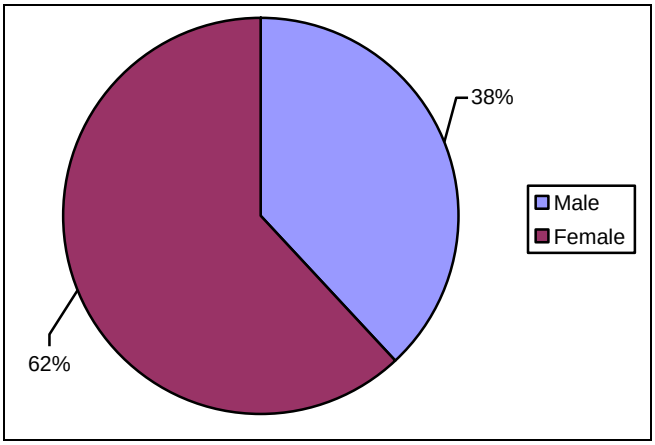

Fig. 1: Gender Distribution.

The male/female ratio was 1.6 to 1. Hypertension was present in 46 (46%) patients and diabetes mellitus was present in 28 (28%) patients (Figure 2).

The mean IOP of the patients was 15.87 ± 4.52 mm Hg and glaucoma was observed in 14 (14%) patients (Figure 3).

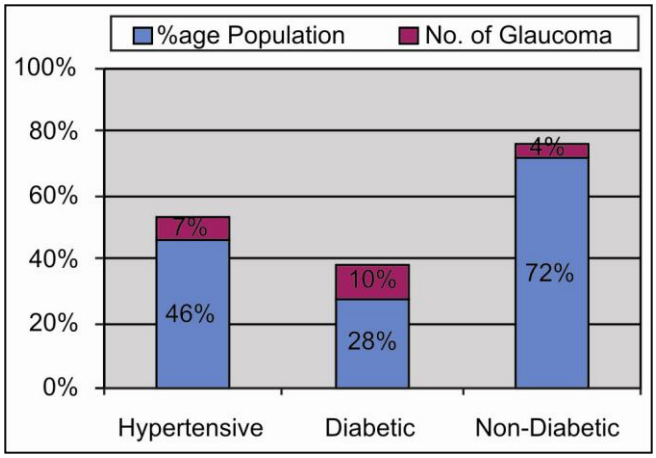

Fig. 2:

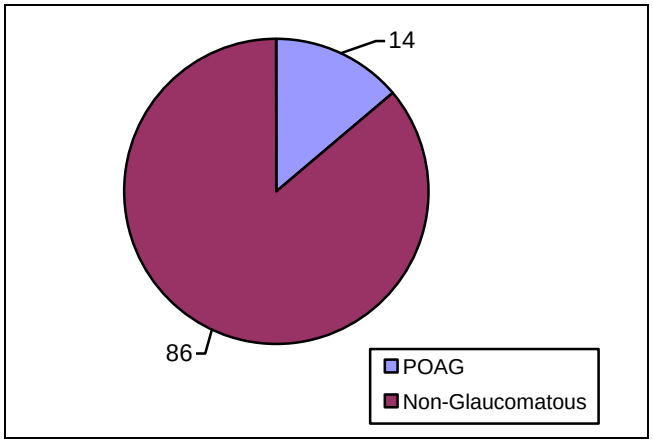

Fig. 3: Incidence of glaucoma.

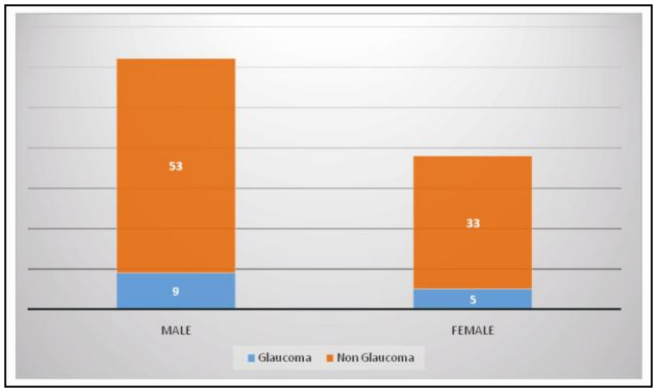

Fig. 4: Glaucoma gender distribution.

The study results showed that among 47 patients of age less than 45 years, glaucoma was found in 4 cases but in 53 patients of age ≥ to 45 years, glaucoma was found in 10 cases. Statistically there is insignificant difference found between the glaucoma with age i.e. p-value = 0.160. Similarly, among 62 males glaucoma was found in 9 cases while out of 38 females glaucoma was found in 5 cases. Statistically there is insignificant difference found between glaucoma with gender i.e. p-value = 0.849 (Figure 4).

Among 51 patients who had duration of RVO less than or equal to 2 months glaucoma was found in 5 cases and in 49 patients who had duration of RVO > 2 months, glaucoma was found in 9 cases but the difference was insignificant i.e. p-value = 0.217. Among 46 hypertensive patients glaucoma was found in 7 cases. The difference was insignificant i.e. p-value = 0.746. In 28 diabetic patients, glaucoma was found in 10 cases but in 72 non diabetic cases, glaucoma was found in 4 cases. Statistically there was significant difference found between the glaucoma with Diabetes Mellitus i.e. p-value= 0.000 (Table 2).

DISCUSSION

Glaucoma encompasses group of ophthalmic diseases that ultimately result in progressive optic neuropathy and loss of visual function. Retinal vein occlusion is an important cause of loss of vision. Glaucoma and retinal vein occlusion have an important causal relationship with one another. Most of the information about this relationship comes from case control studies, clinical trials and clinical case series.

The second leading cause of bilateral blindness is glaucoma i.e. about 8.4 million people have bilateral blindness because of glaucoma (4.5 million people having Open Angle Glaucoma (OAG) and 4 million people having Angle closure glaucoma (ACG). In United States, in 2004 about 2.2 million people were suffering from Primary open angle glaucoma (POAG) and the burden is estimated to rise to 3.36 million by 2020[10].

Hayreh SS et al reported that the overall prevalence of glaucoma was 9.9% in patients with RVO[5]. Fu Chan et al supported the evidence and reported the frequency of glaucoma 9.3% among patients with RVO[11]. While in our study the incidence of glaucoma was 14% in the patients diagnosed as RVO, which appears higher as compared to the other studies.

While another study conducted by B Jonas et al found the frequency of glaucoma in 1.59% cases, among them it was more common in CRVO (18.9%) as compared to BRVO (2.7%)[12].

A study by Hirota A et al showed highest incidence of primary angle closure exhibiting Retinal Vein Occlusion by reporting 8.1% prevalence[13].

One study by da Silva et al showed that prevalence of ocular hypertension and glaucoma was 3.74% (4 patients) and 2.8% (3 patients) respectively. When considering age wise, patients > 40 years, the prevalence of ocular hypertension and glaucoma was 5.4% (4 patients) and 4.76% (3 patients) respectively[14].

The Geneva Study (2010) showed that hypertension was found in 64% of patients and diabetes in 12% of 1267 patients with occlusion of retinal vein (central/branch retinal vein occlusion), while in our study 46 patients were hypertensive out of which 7 were diagnosed as a case RVO[15].

Study conducted by Sperduto et al found an association of CRVO with increased systemic hypertension, diabetes, and glaucoma. These associations were higher association with ischemic CRVO. This study compared 258 patients diagnosed with CRVO over four years span in five centers with 1142 age matched controls. These controls were recruited a year after diagnosis of CRVO from same eye clinics[9,16]. However, in one Study, for example, Klein and associates at the 5 year follow-up were unable to find an association between Ocular hypertension (OHT), IOP, BRVO and glaucoma[17,18].

Studies conducted by Frucht J et al, Amelie P et al and Appiah AP et al reported a higher frequency of raised IOP in cases of occlusion of central retinal vein as compared with branch retinal vein[4,19,20]. As a result of above discussed findings in future there a need to find individual incidence's of different RVO subtypes. These results are comparable with the results of our study.

Our study does have some limitations like small sample size and was conducted in only one tertiary care center. It is proven that with our study and other that there is strong association between glaucoma and retinal vein occlusion. It is recommended that multicenter future studies are required to find out the exact incidence of the patients with CRVO for the presence of glaucoma.

CONCLUSION

Our study concluded that the incidence of glaucoma was significant in patients presenting with retinal vein occlusion (RVO). The frequency seems to be high. So it is recommended that every patient with RVO should be screened for Glaucoma.

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