

HOSPITAL BASED STUDY TO DETERMINE THE PREVALENCE OF GLAUCOMA IN TYPE 2 DIABETIC PATIENTS.

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Abstract

Aim: to analyze the prevalence of glaucoma in type 2 diabetic patients.

Materials and Methods: present observational study was undertaken in the Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India for the period of one year. Total 100 patients of type 2 Diabetes Mellitus were included and detailed history was obtained.

Results: Out of 100 diabetic patients 8 (8%) of them had glaucoma. Out of 8 diabetic patients with glaucoma 75.0% were male. The mean age reported was 58.16±4.81.

Conclusion: This study highlights the prevalence and the demographic characteristics of glaucoma among diabetes mellitus patients in a tertiary care hospital of Bihar. Since, no such study has been done before in this region.

Keywords: Type 2 diabetes, Glaucoma, Bihar

Introduction

Globally there was an estimated 19.4 million diabetes individuals in 1995 which is projected to increase to nearly 80 million in 2030.ⁱ The incidence of blindness is 25 times higher in patients with diabetes than in the general population. Diabetic eye disease is the leading cause of new blindness in people of working age group.ⁱⁱ

Glaucoma is a group of ocular disorders characterized by damaged to the optic nerve. In its early stages, it may present with few or no symptoms but can gradually steal sight without warning due to increased intra ocular pressure the drainage system gets blocked and the fluid cannot exit at a normal rate, thus leading to blindness if not treated timely. The increased pressure pushes against the optic nerve which may result in vision loss usually starting with peripheral or side vision.ⁱⁱⁱ

Glaucoma may lead to permanent blindness affecting 66.8 million people worldwide in year 2000. In India, prevalence of glaucoma range from 4.96% to 14.6%. The World Health Organization (WHO) has reported glaucoma as important eye disease affecting 66.8 million people throughout the world whose treatment has to be done as soon as possible. According to vision 2020 initiative, glaucoma is significantly contributing to global blindness percentage. The risk has been reported to be 1.6–4.7 times higher in individuals with diabetes than in non diabetic individuals.^{iv}

In the view of above mentioned observations the present study was conducted to find the prevalence of glaucoma in type 2 diabetic patients.

Materials and methods

The present observational study was undertaken in the Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India for the period of one year. Total 100 patients of type 2 Diabetes Mellitus were included and detailed history was obtained.

Inclusion criteria

Patients above 30 years of age

Patients pre-diagnosed with Diabetes (as per American Diabetes Association criteria)

Those who give informed consent

Exclusion criteria

- 1) Those who not give informed consent
- 2) Patients presented with any active eye diseases like conjunctivitis etc.

Ethical approval and Informed consent

The study protocol was reviewed by the Ethical Committee of the Hospital and granted ethical clearance. After explaining the purpose and details of the study, a written informed consent was obtained.

Sample selection

The sample size was calculated using a prior type of power analysis by G* Power Software Version 3.0.1.0

(Franz Faul, Universitat Kiel, Germany). The minimum sample size was calculated, following these input conditions: power of 0.80 and $P \leq 0.05$ and sample size arrived were 94 participants. The final sample achieved was 100.

Methodology

A comprehensive eye examination was done by an ophthalmologist including measurement of IOP by applanation tonometry, evaluating the drainage angle of the eye by doing gonioscopy. The optic disc examination by direct ophthalmoscopy and a visual field perimetry was done for each patient.

Statistical Analysis

The data was analyzed using SPSS 19 (SPSS Inc. Chicago, IL, USA) Windows software program. Descriptive frequencies were expressed using mean and standard deviation. Sensitivity and specificity were calculated with 95% confidence interval (CI) where relevant.

Table 1: prevalence of glaucoma in the screened population

Glaucoma	N (%)
Present	8 (8.0%)
Absent	92 (92.0%)
Total	100 (100.0%)

Table 2: demographic and clinical profile of glaucoma positive patients

Age (years)	58.16±4.81
Gender (M/F)	6 (75.0%) / 2 (25.0%)
Duration of diabetes	14.27±1.18

Table 3: type of Glaucoma

Type of Glaucoma	N (%)
Primary open angle glaucoma (POAG)	4 (50.0%)
Phacolytic glaucoma	2 (25.0%)
Primary angle closure glaucoma (PACG)	1 (12.5%)
Neovascular glaucoma	1 (12.5%)
Total	8 (100.0%)

Discussion

The overall prevalence of glaucoma among diabetics 8% in our study is similar to that reported in Maharashtra by Sheetal Dharmadhikari et al.^v The mean age of the subjects was 56.69 ± 13.4 which is quite similar to the results of her study where the mean age was 53.8 ± 10.7 years

Diabetic patients are at risk for two major types of glaucoma, primary open angle glaucoma and neovascular glaucoma.

Several Studies have shown a high prevalence of POAG in patients with diabetes and vice versa. These include Blue Mountain Eye Study^{vi}, Rotterdam Study^{vii} and the Beaver Dam Study in Wisconsin.² The explanation being Diabetes affects the small blood vessels supplying the optic nerve, thereby rendering it more susceptible to glaucomatous damage.

Diabetes also impairs the auto regulation of posterior ciliary circulation which can aggravate the glaucomatous damage. In addition coexisting hypertensive and cardiovascular diseases may affect vascular perfusion of the optic nerve head. Diabetes may be associated with PACG due to systemic autonomic dysfunction or increased lens thickens due to sorbitol accumulation.

Amstrong JR et al.^{viii} has reported that the Primary open angle glaucoma is 1.4 times more common in the diabetic population than in the non - diabetic population. Primary open angle glaucoma (POAG) diagnosed in 4 subjects was the commonest type noted in our study. The higher prevalence of POAG among diabetics in our study coincides with that reported by Mitchell P et al.⁶

The prevalence of Neovascular glaucoma is related to the duration of diabetes and associated diseases. Phacolytic glaucoma is a form of open angle glaucoma associated with hypermature cataractous lens.^{ix} This condition should be handled as an emergency, ultimately by removal of the lens after IOP control.

Conclusion

This study highlights the prevalence and the demographic characteristics of glaucoma among diabetes mellitus patients in a tertiary care hospital of Bihar. Since, no such study has been done before in this region. Hence the present study will play an integral role in raising awareness amongst the people about the ocular manifestations of the disease.

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