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PREVALENCE OF DIABETES MELLITUS AND ARTERIAL HYPERTENSION IN OCULAR DISORDERS

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ABSTRACT

Background: In this study an attempt was made to evaluate the prevalence of Diabetes mellitus and Arterial hypertension in patients with ocular disorders such as Cataract, Glaucoma and Retinopathy.

Materials and methods: It was a six month prospective study. The study was conducted in eye hospital. Patients with disorders of Cataract, Glaucoma and Retinopathy were included in the study.

Results: During the study period a total of 492 patients were enrolled in this study. There were male patients 46% and female patients 54%. Out of 492 patients cataract patients alone 345 (70.13%), Retinopathy patients were 67 (13.60), Glaucoma were 80 (16.27%). Prevalence of Diabetes mellitus in Retinopathy is 41.79%. Prevalence of Hypertension Retinopathy is 5.98%. Prevalence of Diabetes mellitus and Hypertension in Retinopathy is 37.31%. Prevalence of Diabetes mellitus in Glaucoma is 17.50%. Prevalence of Hypertension in Glaucoma is 17.50%. Prevalence of Diabetes mellitus and Hypertension in Glaucoma is 10.00%. Ocular disorders without Diabetes mellitus and Hypertension in patients cataract is 50.81%, Retinopathy 2.03% and Glaucoma 9.55%.

Conclusion: The results showed that Diabetes Mellitus is one of potential risk factor for ocular disorder like Retinopathy. In this prospective study Cataract was most important cause of vision impairment. There was no strong influence of Diabetes Mellitus and Hypertension in Cataract and Glaucoma

Introduction

The common ocular disorders are Cataract, Glaucoma and Retinopathy. The numbers of risk factors are associated with Ocular disorders. Identification of factors that could delay or prevent ocular disorders development. Cataract

is an opacification of lens that causes decreased visual acuity and can lead to Blindness¹. Specific proteins within the lens are responsible for maintaining its clarity. Over many years, the structures of these lens proteins are altered, ultimately leading to a gradual clouding of the lens.

The hyperglycaemia increases retinal blood flow and metabolism and has direct effects on retinal endothelial cells and pericyte loss which impairs vascular auto regulation. The un controlled blood flow dilates the retinal capillaries and produces the vaso active substances which cause proliferation of endothelial cells resulting in occlusion of retinal capillaries. It causes retinal hypoxia which stimulates the endothelial growth factors and increase vascular permeability causing new vessel formation.² It may lead to diabetic retinopathy.

In Glaucoma, microvascular damage from diabetes could impair blood flow to the anterior optic nerve, resulting in optic nerve damage³. Diabetes also impairs the autoregulation of posterior ciliary circulation, which may exacerbate glaucomatous optic neuropathy.⁴ Diabetes Mellitus increases the susceptibility of retinal ganglion cells to additional stresses relating to elevated IOP.⁵ It seems reasonable to consider that a longer duration of DM with a prolonged insult to the retina and optic nerve via vascular, glial, and neuronal factors would be associated with a higher risk of Glaucoma. Second, patients with diabetes often have concomitant cardiovascular risk factors (e.g., hypertension) that may affect vascular perfusion of the optic nerve head⁶. Finally, relative to those without diabetes, persons with diabetes may be more vulnerable to elevated IOP⁷ with more severe visual field loss at the same IOP level.

In this study an attempt was made to evaluate the prevalence of Diabetes mellitus and Arterial hypertension in ocular disorders such as Cataract, Glaucoma, and Retinopathy.

Methodology

Study population

It was a six month prospective study. The study was conducted in ARASAN EYE HOSPITAL at Erode. All the patients with complaints of Cataract, Glaucoma, and Retinopathy, were included in the study. Those patients with other than Cataract, Glaucoma, and Retinopathy were excluded from the study.

A total of 492 patients were enrolled in the study. All the patients with the complaints of Cataract, Retinopathy, and Glaucoma with clinical diagnosis were included in the study. There were 226 male patients and 266 female patients. The total study period was 6 months. The study was approved by institutional ethical committee.

Results

Total of 492 patients were enrolled in the study. All the patients with the complaints of cataract, retinopathy, and glaucoma with clinical diagnosis were included in the study. There were 226 male patients (46%) and 266 female patients (54%). Most of the patients were between the age group of 60-70 years (43.49%) followed by 50-60 years (24.18%). Out of 492, 345 (70.13%) patients having cataract alone, Retinopathy patients is 67 (13.60%), Glaucoma were 80 (16.27%). Prevalence of Diabetes mellitus in cataract is 9.00%. Prevalence of Hypertension in cataract is 7.82%. Prevalence of Diabetes mellitus and Hypertension in cataract is 11%. Prevalence of Diabetes mellitus in Retinopathy is 41.79%. Prevalence of Hypertension Retinopathy is 5.98%. Prevalence of Diabetes mellitus and Hypertension in Retinopathy is 37.31%. Prevalence of Diabetes mellitus in Glaucoma is 17.50%. Prevalence of Hypertension in Glaucoma is 17.50%. Prevalence of Diabetes mellitus and Hypertension in Glaucoma is 10.00%. Ocular disorders without Diabetes mellitus and Hypertension in patients cataract is 50.81%, Retinopathy 2.03% and Glaucoma 9.55%.

Table – 1. Distribution of Cataract among the patients.

Types	Number of Patients (n=492)	Percentage (%) of Patients
Cataract	345	70.13
Non-cataract	147	29.87

Figure -1. Prevalence of Diabetes mellitus in cataract patients.

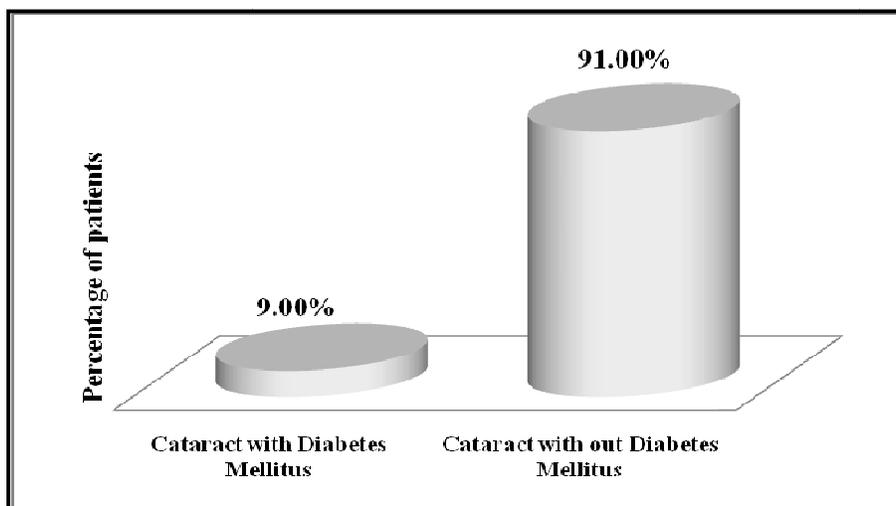


Table -2. Prevalence of Diabetes mellitus in Retinopathy patients

Type	Number of Patients (n=67)	Percentage (%) of Patients
Retinopathy with Diabetes Mellitus	28	41.79
Retinopathy without Diabetes Mellitus	39	58.20

Table -3. Prevalence of Hypertension in Glaucoma patients.

Type	Number of Patients (n=80)	Percentage (%) of Patients
Glaucoma with Hypertension	11	14.00
Glaucoma without Hypertension	69	86.00

Discussion

There were 226 male patients (45%) and 266 female patients (54%). It indicated there was no significant sex predilection with male and female in this study. Result of this study on sex predilection consistent study conducted by Shashi *et al*⁸.

Prevalence of Cataract is more among the patients. It indicates Cataract were most important cause of vision impairment 345 (70.13%). Result of this study on Prevalence of Cataract consistent with study of prevalence and determinanants of diabetic retinopathy and cataracts in west African type 2 Diabetes patients conducted by Rotimi⁹ *et al*. Prevalence of Diabetes mellitus in cataract 9% and Hypertension is 7.82%. Result of this study on Prevalence of Diabetes Mellitus and Hypertension in cataract is inconsistent with study of influence of modifiable risk factors like hypertension and diabetes on senile cataract conducted by Shakil¹ *et al*. The result support there is no strong influence of Diabetes Mellitus and Hypertension in cataract. In patients with Diabetes Mellitus and Arterial hypertension are more prevalence than above diseases alone 37 (11%).

Prevalence of Diabetes Mellitus in Retinopathy 41.79%. The result supports the evidence of failure of management of eye complications of Diabetes Mellitus. This report have a positive association with the study diabetic eye disease and its management among adults aged 40 years with self-reported diabetes in Fiji conducted by Brian¹⁰ *et al*. Prevalence of Arterial hypertension in Retinopathy is 5.98%. The result also indicating Diabetes Mellitus is a modifiable risk factor than Arterial hypertension in Retinopathy.

Prevalence of Diabetes Mellitus in Glaucoma is 18% and Arterial hypertension 14%. The data suggest that, although diabetes and metabolic abnormalities may be slightly associated with the Glaucoma, they are not significant risk factors for glaucoma. This study also supported the result of study Diabetes, metabolic abnormalities, and Glaucoma conducted by Tan¹¹ *et al*.,

No significant differences were found between the prevalence of male and female in the study. Since male and females were almost similar to predisposition of ocular disorders. There is no significant relationship

between the cataract and Diabetes Mellitus, Arterial hypertension. No direct relationships were not found between Arterial hypertension and Retinopathy.

There was slight evidence that Diabetes mellitus and Arterial hypertension may be the risk factor for the Glaucoma. There was clear evidence that potential association between Diabetes Mellitus and Retinopathy.

Conclusion

The results showed that Diabetes Mellitus is one of potential risk factor for ocular disorder like Retinopathy. In this prospective study Cataract were most important cause of vision impairment. There was no strong influence of Diabetes Mellitus and Hypertension in Cataract and Glaucoma. However because the study sample included a low proportion of persons, further research is needed to determine the relevance of these result to the large general population.

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