

INTRAOCULAR PRESSURE VARIATION IN DIABETIC AND NON-DIABETIC INDIVIDUALSSmita S. Patil¹, R. H. Taklikar², Anupama Taklikar³, Anant Takalkar⁴**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: INTRODUCTION: Intraocular pressure constitutes the most important risk factor for the emergence of glaucoma. Diabetes has been associated with raised intraocular pressure. It is an important ocular risk factor associated with the occurrence of retinopathy, certain types of lens opacification (cataract), intraocular pressure increase and also open angle glaucoma during its course. The main objective of this study is to study variation in Intra Ocular Pressure (IOP) in normal subjects and subjects with diabetes. **METHODS:** 60 subjects, aged between 40-70 years, were equally divided into study group and control group. Their IOP was recorded using standard procedure after obtaining their informed consent. **RESULTS:** The mean IOP in diabetic group in Right and Left eyes showed an increase in IOP of 0. 61 and 0. 37 mm Hg when compared with the non-diabetic (control) group. **CONCLUSION:** With this study, we conclude that the mean IOP in diabetic subjects showed a marginal increase when compared with non-diabetic subjects.

KEYWORDS: Intraocular Pressure, Glaucoma, Diabetes.

INTRODUCTION: Elevated intraocular pressure, which is a main risk factor for glaucoma, is a major concern among diabetics. Diabetes mellitus is an important ocular risk factor.¹ Diabetes has been found to be associated with elevated intraocular pressure (IOP), particularly primary open angle glaucoma (POAG). IOP has been associated with different systemic, familial, anthropometric and demographic factors by several studies.² Several studies have reported factors including age, sex, African ancestry, blood pressure, BMI, alcohol, smoking, myopia and family history of glaucoma to be positively associated with elevated IOP in general.³ Diabetes mellitus is an important risk factor associated with the occurrence of retinopathy, certain types of cataract, and glaucoma during its course. Diabetes mellitus cause micro vascular damage and also affect vascular auto- regulation in the retina and optic nerve. There have been several hypotheses for the association between diabetes and elevated IOP. Diabetes - related autonomic dysfunction might be the probable factor which contributes to an increase in IOP.⁴

OBJECTIVES: To study variation in IOP in normal subjects and subjects with diabetes.

MATERIALS AND METHODS: The present study was conducted in the Out Patient Department of Department of Ophthalmology, Navodaya Medical College Hospital, Raichur, Karnataka. It's a cross sectional hospital based observational descriptive study including 30 diabetics (cases) and 30 non diabetics (controls) in the age group of 40-70 years.

The study was approved by ethical committee. Written informed consent was obtained from each subject. IOP was measured in both eyes using Schiottz tonometer and recorded after putting lignocaine drops in both eyes and recorded after 5 minutes. IOP measurements were always

ORIGINAL ARTICLE

performed between 9: 00 am-12: 00 pm by Schiötz tonometry to minimize the diurnal variation. Blood glucose was estimated using Glucometer.

INCLUSION CRITERIA:

- Subjects with age group 40-70years.
- Subjects were considered diabetics when fasting glucose was > 120mg/dl or [postprandial blood glucose > 150mg / dl].
- Subjects who are willing to participate in the study after written informed consent.

EXCLUSION CRITERIA:

- Glaucoma or IOP lowering medications,
- Ocular diseases
- H/O of smoking
- H/O of alcohol use
- H/O of hypertension

STATISTICAL ANALYSIS: Data thus collected using a proforma and entered in MS excel sheet. Data analysis is done by using SPSS 19.0 version. All the results were shown as Mean \pm SD. Statistical analysis was done by using unpaired 't' test for comparison of mean values in two groups. A 'p' value less than 0. 05 is considered as significant whereas less than 0. 001 is highly significant.

RESULTS: In our study, we observed that mean age of subjects in case group was 55.2 \pm 6.2 and in controls was 48.3 \pm 4.5. The mean random blood sugar level was 201.4 \pm 67.1 in diabetics whereas it was 89.7 \pm 12.9 in non-diabetics. (Table 1) On measuring the IOP in the right eye, we obtained mean value of 17.21 \pm 1.4 in diabetic cases whereas it was 16.60 \pm 0.99 in non-diabetics. This variation was statistically not significant. (Table 2). Similar measurement for the left eye showed mean IOP of 16.58 \pm 1. 28 for diabetics and 16.21 \pm 1.25 for non-diabetics. This difference is also not significant. (Table 3).

Study Group	Mean age (yrs)	Mean RBS (mg %)
Cases (DM) n=30	55.2 \pm 6.2	201.4 \pm 67.1
Controls (NDM) n=30	48.3 \pm 4.5	89.7 \pm 12.9

Table 1: Distribution of cases and controls according to age group

Study Group	Mean IOP (mmHg)	S. D	't'	P value	Interpretation
Cases (DM) n=30	17.21	1.4	1.77	0.08 (>0.05)	Not significant
Controls (NDM) n=30	16.60	0.99			

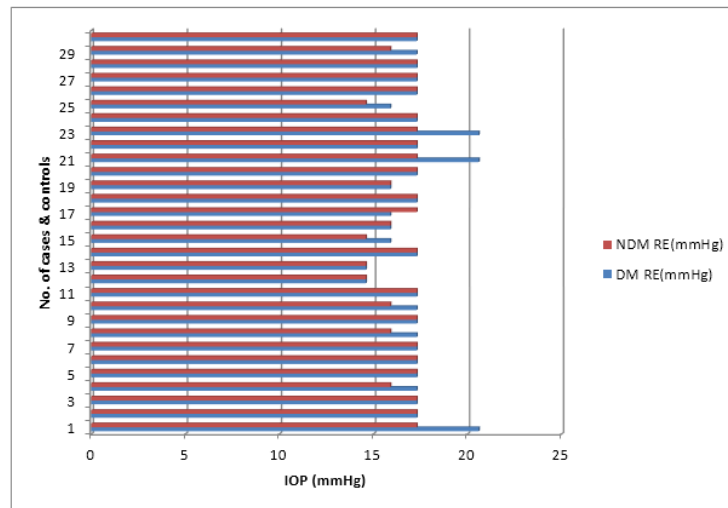
Table 2: Comparison of IOP in Right eye in Non-diabetic and diabetic

ORIGINAL ARTICLE

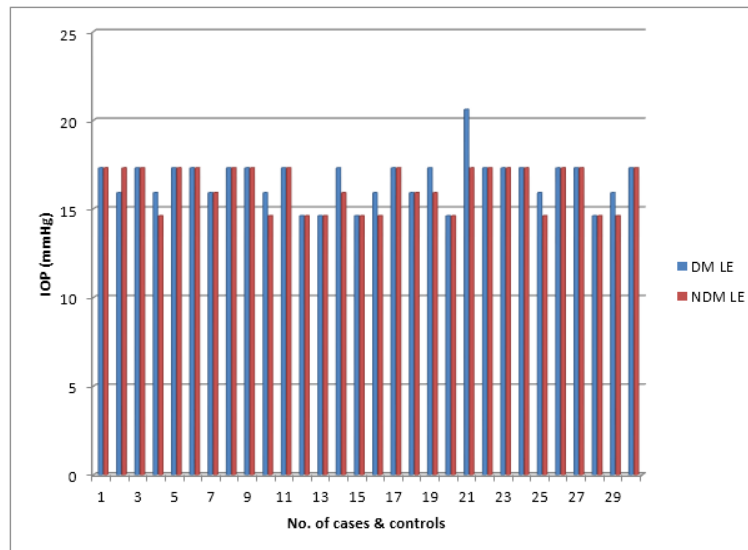
Study Groups	Mean IOP (mmHg)	S. D	't'	P value	Interpretation
Cases (DM) n=30	16.58	1.28	1.14	0.25 (>0.05)	Not significant
Controls (NDM) n=30	16.21	1.25			

Table 3: Comparison of IOP in left eye in Non-diabetic and diabetic

The individual recording of IOP in right eye & left eye was plotted in a bar graph and is presented as Graph 1 (Right eye) and Graph 2 (Left eye).



Graph 1: Showing IOP variation in Right Eye in Non-Diabetic (controls) & Diabetic (cases)



Graph 2: Showing IOP variation in left eye in Non-Diabetic (controls) & Diabetic (cases)

ORIGINAL ARTICLE

DISCUSSION: In present study, the diabetics showed marginal higher IOP than non-diabetics. The mean IOP in control population (i. e. non diabetics) was 16.60 ± 0.99 and 16.21 ± 1.25 mmHg in right and left eyes respectively. The normal mean IOP reported by Becker⁵ was 16.1mmHg. A marginal increase in mean IOP in diabetics was found in our study. However our study is not in agreement with the report of Palomar⁶ and Armaly⁷ who observed low IOP in diabetics as compared to non-diabetics.

CONCLUSION: The mean IOP in diabetic group in Right and Left eyes showed an increase in IOP of 0.6 and 0.3 mm Hg when compared with the non-diabetic (control) group. With this study, we conclude that the mean IOP in diabetic subjects showed a marginal increase when compared with non-diabetic subjects which is not statistically significant. Hence, in diabetics IOP should be monitored regularly so as to prevent complications.

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