An observational Study of Ocular Changes in Patients with Type-2 Diabetes Mellitus

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Abstract

Background: Diabetes mellitus increasing fast in worldwide. In India is set to emerge as the diabetic capital of the world. According to the WHO, 31.7 million people were affected by diabetes mellitus (DM) in India in the year 2000. This figure is estimated to rise to 79.4 million by 2030, the largest number in any nation in the world.

Aim: To find out ocular changes in patients with type 2 diabetes mellitus relations.

Materials and Methods: Total 50 patients attended in Eye OPD for ocular complication with Type 2 diabetes mellitus at DMCH, Laheriasarai, Bihar from June 2019 to May 2020. In 50 patients, 30 patients selected for this study whose aged 40-70 years and suffering from diabetes mellitus 5 or >5 years.

Results: We found the majority of cases 12(40%) in age group between 51-60 years and sex distribution males 18(60%) were more than females (40%). The other most common ocular manifestations were Diabetic retinopathy 14(46.66%), cataract 13(43.33%), cranial nerve palsy 4(13.33%) and glaucoma 4(13.33%).

Conclusion: In this finding patient advice to time-to-time screening and eye examination, who is suffering from diabetes.

Keywords: Ocular, Diabetes Mellitus, Cataract, Diabetic Retinopathy, Glaucoma

Background

According to the 2004 WHO publication, there are 171 million people worldwide suffering from diabetes mellitus, a figure which is predicted to be doubled by 2030. In 2002, 5 million people were blind because of diabetic retinopathy, constituting around 5% of the world blindness. In India, The prevalence of diabetic retinopathy is found to vary between 10.5% and 26.2%. It is one of the leading causes of new blindness in individuals between 20 to 74 years of age in both developed and developing countries. Because of this increasing incidence, it has been included in the "priority list" of "Vision 2020" [1].

An increase in the prevalence of retinopathy has been noticed as age advances. The hormonal changes

occurring during puberty influence the progression of retinopathy. 3. Sex incidence In the WESDR study, an increased incidence of proliferative diabetic retinopathy was observed in men with an earlier onset of diabetes than women but there was no significant difference in the prevalence or progression of retinopathy between males and females [2].

Ocular factors like Glaucoma, myopia and retino-choroidal scarring from trauma and inflammation have been proposed to protect against the development and progression of retinopathy. The aim of our study to find out the relation of ocular changes in patients with type 2 diabetes mellitus.

Material and methods

This observational study was conducted at Department of Ophthalmology, Darbhanga Medical College and Hospital, Laheriasarai, Bihar from June 2019 to May 2020. Total 30 patients (out of 50) included, age range 40-70 years and they were suffering diabetes mellitus type 2, five and more than 5 years were selected for this study who attended eye OPD of DMCH, Laheriasarai, Bihar.

All patients were screened with a detailed history including type & duration of diabetes, diet history and history about physical activity. History of treatment with oral hypoglycemic agents, insulin and other drug intake was 43 elicited. History of systemic comorbidities like hypertension, coronary artery disease etc. and their treatment was enquired about. Previous ophthalmic surgery/laser or other medical treatment history was also taken. All patients then underwent a thorough systemic and ocular examination.

Visual acuity (by Snellen's chart) and refraction were measured. Anterior segment evaluation was done with slit lamp biomicroscopy. Intraocular pressure was measured using Applanation tonometry. Diabetic retinopathy was evaluated by a dilated fundus examination using 90D & indirect ophthalmoscopy. Fundus photographs were taken for documentation and the levels of retinopathy will then be classified as per the ETDRS.

Results

In this study total 30 patients, there were 40-50 years age group 10 (33.33%), 51-60 years age group 12(40%) and age group between 61-70, 8 patients (26.66%). (Table 1).

Table 1: Age distribution of enrolled Patients (n=30)

Age group (in years)	No. of patients	Percentage
40-50	10	33.33%
51-60	12	40.00%
61-70	8	26.66%

The present study sex distribution of the patients males 18(60%) were more than females (40%). (Table 2).

Table 2: Sex distribution of enrolled Patients (n=30)

Sex	No. of patients	Percentage
Male	18	60.00%
Female	12	40.00%

Distribution of enrolled patient Visual acuity (by Snellen's chart) and refraction were measured in Table 3, among which 5 patients (16.66%) had VA < 3/60. The other most

common ocular manifestations were Diabetic retinopathy 14(46.66%), cataract 13(43.33%), cranial nerve palsy 4(13.33%) and glaucoma 4(13.33%).

Table 3: Distribution of visual acuity (by Snellen's chart) and refraction of enrolled Patients (n=30)

Visual acuity	No. of patients	Percentage
6/6-6/18	6	20.00%
6/18-6/60	9	30.00%
6/60-3/60	10	33.33%
< 3/60	5	16.66%

In the present study different corneal findings observed in 8 patients, 1(12.5%) patients had exposure keratopathy, 4(50%) patients had corneal ulcer, 3(37.5%) patients had superficial punctuate keratitis.

The different types of glaucoma in the diabetic patients are shown in the Table 4. Diabetic retinopathy was present in 14 patients (46.66%) and it was graded according to ETDRS classification as in Table 5.

Table 4: Different type of Glaucoma present in diabetic patients (n=10)

Type of Glaucoma	No. of patients	Percentage
Primary Open angle glaucoma	5	50.00%
Primary angle-closure glaucoma	1	10.00%
Neovascular glaucoma	3	30.00%
Lens induced glaucoma	1	10.00%

Table 5: Diabetic retinopathy graded according to ETDRS classification (n=14)

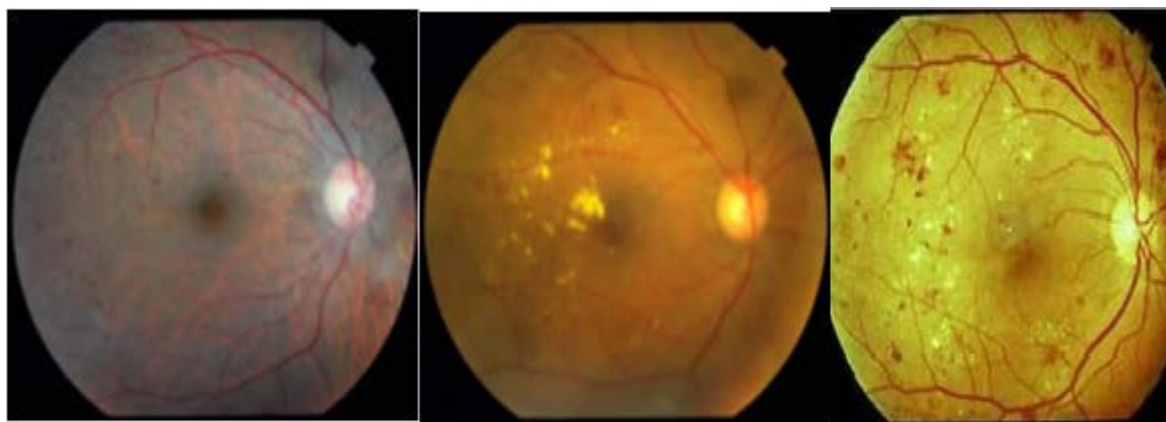| Classification	No. of patients	Percentage
Non-Proliferative diabetic retinopathy (NPDR) Mild	1	7.14%
Non-Proliferative diabetic retinopathy (NPDR) Moderate	2	14.28%
Non-Proliferative diabetic retinopathy (NPDR) Severe	3	21.43%
High risk Proliferative diabetic retinopathy (PDR)	1	7.14%
Advanced Proliferative diabetic retinopathy (PDR)	1	7.14%
Diabetic Macular edema (DME)	7	50.00%

Figure 1: Mild NPDR; Moderate NPDR; Severe NPDR

Discussion

The ocular changes in patients with diabetes mellitus are one of the most consistent risk factors for the development and progression of diabetic retinopathy [3]. It is also a significant risk factor for the development of maculopathy. In Type I DM, retinopathy develops at least 3-4 years after disease onset. Since the duration of development in type 2 diabetes is difficult to determine, retinopathy may present as an early sign soon after diagnosis.

An increase in the prevalence of retinopathy has been noticed as age advances. The hormonal changes occurring during puberty influence the progression of retinopathy.

In the WESDR study, an increased incidence of proliferative diabetic retinopathy was observed in men with an earlier onset of diabetes than women but there was no significant difference in the prevalence or progression of retinopathy between males and females.

Glaucoma, myopia and retino-choroidal scarring from trauma and inflammation have been proposed to protect against the development and progression of retinopathy.

The Airlie House standardized classification consisted of comparing stereo photographs in 7 standard fundus photographic fields with the patient's findings in those same 7 photographic fields and classifies DR into 13 complex levels ranging from level 10 to level 85. Modified form of this classification was used in the Diabetic Retinopathy Study (DRS) and Early Treatment of Diabetic Retinopathy Study (ETDRS).

In this present study help us to know the ocular changes in patients with type 2 diabetes mellitus relations. We found the majority of cases 12(40%) in age group between 51-60 years as in accordance to many studies [4,6]. and sex distribution males 18(60%) were more than females (40%) but a study reported that chronic subclinical inflammation showed stronger association of Type 2 DM with women than men [7]. According to present study, majority of the patients 10(33.33%) with visual acuity by Snellen's chart and refraction was between 6/60-3/60 and 16.66% had visual acuity <3/60 which emphasizes that all diabetic patients must be aware of the vision threatening complications of diabetes and hence the need for regular eye examinations [8,9]. The other most common ocular manifestations were Diabetic retinopathy 14(46.66%), cataract 13(43.33%), cranial nerve palsy 4(13.33%) and glaucoma 4(13.33%).

Diabetic retinopathy being the major cause of visual impairment in patients with diabetes, about 46.66% of patients have been diagnosed with diabetic retinopathy where majority of them had severe NPDR [10,15].

Conclusion

The ocular complications in patients with diabetes mellitus is major cause of blindness despite increased understanding of these ocular conditions and identification of successful treatments. So time to time screening and eye examination, are required for the reduction of diabetes-related vision loss.

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