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Prevalence of Ocular Morbidities Amongst the Patients of Diabetes Mellitus of More Than 10 Years Duration

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Abstract

Background: Diabetes mellitus is one of the most common non communicable disease and one of the most important public health problems in India. There are many known ocular complications of diabetes, ranging from conjunctivitis to more severe one like diabetic retinopathy, retinal vein occlusion and optic nerve atrophy. *Aim:* The present study was conducted to find out the prevalence of ocular morbidities in type 2 diabetes mellitus of more than 10 years duration. *Material and Methods:* A hospital based cross sectional study was conducted on patients suffering from diabetes mellitus, type 2, for more than 10 years. After initial laboratory investigations, a detailed ocular examination was conducted using auto-refractometer, Snellen's chart, Slit lamp, Schiotz's tonometer. Retinoscopy and fundus examination was also carried out to determine the relevant pathologies. If required, further examinations such as B scan, Gonioscopy were done. *Results:* The most common ocular morbidity noted was cataract (47.61%). More severe complications like, chorio retinal complications were seen in 198 (32.62%) subjects. Other ocular morbidities were refractive errors (25.70%), glaucoma (8.24%), Episcleritis (0.66%), Uveitis (0.49%), Mono neuropathy; 3, 4 or 6th nerve palsy (0.49%). The study has revealed that the duration of diabetes was statistically associated with the diabetic retinopathy ($p<0.001$). *Conclusions:* Diabetes mellitus affects all parts of the visual system.

Keywords: Diabetes Mellitus; Ocular Morbidity; Cataract; Duration of Diabetes.

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Introduction

With increase in the life expectancy and control of major communicable diseases, the morbidity and mortality profile of India is gradually shifting from the communicable diseases to non communicable diseases. Diabetes mellitus is one of the main non communicable diseases determining the health profile of the community. According to WHO, about 19% of the total world diabetic population lives in India. As per an estimate, the number of diabetic population will increase to 80 million by 2030 [1]. India is the diabetes capital of the world with 41 million Indians having diabetes; every fifth diabetic in the world is an Indian [2].

Diabetes mellitus (DM) is an important health problem that induces complications and it causes significant morbidity owing to specific microvascular complications such as, retinopathy, nephropathy and neuropathy, and macrovascular complications such as, ischaemic heart disease, and peripheral vasculopathy [3]. Diabetes mellitus and its complications are rapidly becoming the world's most significant cause of morbidity and mortality [4,5].

There are many known ocular complications of

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diabetes, ranging from conjunctivitis to more severe one like diabetic retinopathy, retinal vein occlusion and optic nerve atrophy [6]. The incidence of these complications amongst diabetes patients depends upon the type of diabetes, its duration, its control, and other patient related factors. There are very few studies which has assessed the prevalence of ocular manifestations of type 2 diabetes mellitus of longer duration. So, the present study was planned to assess the ocular morbidities in diabetes mellitus of more than 10 years duration.

Aims

The present study was conducted to find out the prevalence of ocular morbidities amongst the patients of diabetes mellitus of more than 10 years duration, visiting a tertiary care hospital.

Material and Methods

The study was a hospital based cross sectional study, conducted jointly in the department of Ophthalmology and General Medicine at Ashiwini Rural Medical College Hospital and Research Center, Kumbhari. The study period was between January 2017 and December 2017. The inclusion criteria for the study subjects were as follows

1. Patients suffering from diabetes mellitus, type 2, for more than 10 years.
2. Patients visiting General Medicine OPD or diabetic clinic at the study center.
3. Patients who consent for participation in the study.

The exclusion criteria for the study subjects were

1. Type 1 diabetes patients
2. Diabetic patients, whose diabetes was diagnosed within last 10 years.
3. Patients who do not consent to participate in the study.

The patients who fulfill the inclusion criteria were referred to the ophthalmology department by the general medicine department/diabetic clinic run at the study centre, Before the referral, tests for fasting sugar, PP sugar and HBA1C were done. In the department of ophthalmology the detailed ophthalmic evaluation was done. Visual acuity testing was done by auto-refractometer and by using Snellen's chart. Anterior segment examination was done by using a torch. Slit lamp examination was done to detect any corneal or lens pathology. Intraocular pressure was recorded using Schiotz's tonometer. Retinoscopy and fundus examination was also carried out to determine the relevant pathologies. If required, further examinations such as B scan, Gonioscopy were done. Data of each study subject was collected in a standard proforma.

Statistical Analysis

Continuous variables were summarized with mean and SSD, and categorical variables as percentages. χ2-test was used to explore associations between categorical variables. Two-tailed tests were performed with the significance level at 0.05. Data was analysed by using SPSS 17 software.

Results

A total of 607 patients, who fulfilled the inclusion criteria, were selected for the study. Of these 607 patients, 313 were males and 294 were females. The age and sex wise distribution of the study subjects is shown below. Maximum numbers of patients were in the age group of 65-70 years followed by 60-65 years (Table 1).

Table 1: Age and sex wise distribution of study subjects

Sr.	Age Group	Males	Females	Total
1	40 - 45	2	0	2
2	45-50	10	11	21
3	50-55	33	25	58
4	55-60	46	35	81
5	60-65	65	74	139
6	65-70	78	84	162
7	70-75	56	35	91
8	> 75	23	30	53
	Total	313	294	607

Table 2 shows the ocular morbidities in study subjects. The most common ocular morbidly was cataract (47.61%). More severe complications like, chorio retinal complications were seen in 198 (32.62%) subjects. Because of multiple pathologies in a subject, the total does not match with the number of subjects.

Table 2: Ocular morbidities in study subjects

Sr	Morbidity	Subjects affected	Pecentage
1	Conjunctivitis	10	1.65
2	Episcleritis	4	0.66
3	Uveitis	3	0.49
4	Refractive errors	156	25.70

5	Cataract	289	47.61
6	Chorio-retinal	198	32.62
7	Glaucoma	50	8.24
8	Mono neuropathy	3	0.49

Table 3 shows the distribution of chorio-retinal pathologies in the study subjects. Diabetic retinopathy was seen in 25.21% of patients.

Table 4 shows the association of duration of diabetes and the diabetic retinopathy. It is evident from the table that the prevalence of diabetic retinopathy increases with the duration of the diabetic. The prevalence was 16.73% for patients with diabetes for 10-14 years duration. The same increased to 41.18% for the patients with diabetes of more than 25 years duration. The association of duration of diabetes and diabetic retinopathy was found to be statistically significant. ($p = 8.90 \times 10^{-5}, < 0.0001$).

Table 3: Distribution of chorio-retinal pathologies in the study subjects

Sr.	Pathology	Subjects affected	Percentage
1	Diabetic retinopathy	153	25.21
2	Vitreous pathology	18	2.97
3	Retinal vein/artery occlusion	6	0.99
4	Retinal detachment	5	0.82
5	Chorioretinitis	2	0.33
6	Macular pathologies	12	1.98
7	Optic nerve atrophy	2	0.33

Table 4: Association of diabetic retinopathy with duration of diabetes

Sr	Duration of diabetes	Total subjects	Diabetic retinopathy	Percentage	P value
1	10 -14	251	42	16.73	< 0.001
2	15 -19	190	51	26.84	
3	20-25	115	39	33.91	
4	> 25	51	21	41.18	

Discussion

The present study was conducted in 607 diabetic patients with the duration of diabetes for more than 10 years, to assess the prevalence of ocular pathologies in them.

The commonest ocular morbidity in the present study was cataract. There were 289 patients with visual impairment due to cataract. Age-related senile cataract is the most common cause of visually significant cataract. Posterior subcapsular cortical cataract is most common form of cataract in diabetic patients [7]. Formation of senile cataracts is accelerated in diabetes, probably due to non-enzymatic glycation and cross linking of modified crystallins. However, the reported prevalence of 47.61 % in the present study was much lower than the prevalence reported by Harding JJ [8].

The present study reported the prevalence of refractive errors as 25.70%, which is much lower than the reported prevalence of Vasuki G et al [9]. Haq et al. reported the prevalence of refractive error as 25% [10]. A Study by Nirmalan et al. [11], reported it as 71.8% and Singh et al. reported it as 40.8% [12]. The vast differences in the prevalence rates were due to the different study settings and vast differences in the socio demographic characteristics of the study subjects.

The study has revealed that 198 patients had retinal and choroidal lesions. The various chorio retinal manifestations were diabetic retinopathy (25.21%), vitreous pathology (2.97%), retinal vein/artery occlusion (0.99%), retinal detachment (0.82%), chorioretinitis (0.33%), macular pathology (1.98%) and optic atrophy (0.33%). The primary cause of microvascular complications of diabetes retinopathy is hyperglycemia and glycosylation of tissue proteins. The reported prevalence of chorio retinal lesions is comparable to that reported by Vasuki G [9] and Narendran et al. [13].

The prevalence of glaucoma was reported as 8.24% in present study. It was higher than the value reported Vasuki G and Beena R. It was also higher than a study by Ramakrishnan et al. The difference in prevalence of glaucoma was due to the fact that present study selected the diabetes patients with duration of more than 10 years. So because of the more duration of diabetes and subsequent aged population selection, the present study reported comparatively higher prevalence.

Other ocular morbidities reported were Episcleritis (0.66%), Uveitis (0.49%), Mononeuropathy; [3,4] or 6th nerve palsy (0.49%). All these findings were comparable with the findings of Narendran et al. and Rush et al. [14].

Conclusion

The study has also pointed out that diabetes mellitus affects every part of visual structure from conjunctiva to optic nerve. The present study also has revealed the high prevalence of

ocular morbidities in diabetes mellitus, especially cataract and chorio retinal pathologies, leading to visual impairment. It has also pointed out that the duration of diabetes was statistically associated with the diabetic retinopathy.

Support: Nil

Conflicts of interest: Nil

Permissions: Nil

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