Ocular manifestations of diabetes mellitus Bundelkhand region: Observational study

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Abstract
In current scenario, Diabetes mellitus is a major health problem world wide. Diabetes induced vasculoangiopathy can cause serious sight threatening complications. Aim of the study was to assess the prevalence of various types of ocular complications in diabetic peoples".
In this cross-sectional study total 887 diabetic subjects (irrespective of type, duration and medication of diabetes) were included all study subjects were underwent for detailed history and through examinations. Complete Ophthalmological evaluation as external oOcular examinations including initial visual acuity, slit lamp examination, fluorescein dye staining, Schirmer's test, tear film break-uptime (TBUT), refraction, fundus examination with direct/Indirect ophthalmoscopy was done. Perimetry, tonometry, FFA, and OCT were done as per requirement. In this study the male and female ratio was 1.7:1. Diabetic retinopathy (48.70%) was the major ocular manifestation. Other manifestations were cataract (38.22%), Meibomitis (31.91%), Dry eye disease (15.33%), NVI (7.33%), Glaucoma. The high poverty, low literacy and low health care facilities in Bundelkhand regions affected the study results. We have to communicate with diabetic and pre-diabetic peoples about proper key factors to control these complications.

Keywords: Diabetic retinopathy, FFA, Glaucoma, Meibomitis, NVI, OCT, Optic neuropathy, Perimetry.

Introduction
Diabetes mellitus is a leading cause morbidity in the Indian subcontinent. Type 1 diabetes is rapidly fatal.[1] About 90% of people with diabetes around the world have type 2. It is largely the result of excess body weight and physical inactivity.[1] The public health burden of DM is largely attributed to the fact that hyperglycemia increases the likelihood of both macrovascular and microvascular complications.[2] Most prominent manifestation of impaired macrovascular function in DM is accelerated atherosclerosis, microvascular dysfunction leads to nephropathy and retinopathy. Diabetic retinopathy (DR) is the most common and is the leading cause of blindness among working-age adults in Westernized societies.[3] Changes in the microvasculature result in increased vascular permeability and ischemia.[4]Vascular endothelial growth factor (VEGF) is secreted by ischemic retina. VEGF leads to increased vascular permeability and angiogenesis (new blood vessel formation).

Possible ocular complications:

Diabetic Retinopathy[5]	**Cataract[6]**
Diabetic keratopathy[7]	Dry eye
Ischemic optic neuropathy[8]	Diabetic papillopathy[9]
Ocular movement disorder[10]	Glaucoma[10]

Materials and Methods
A total 887 newly diagnosed patients of Diabetes mellitus were included in this cross-sectional study. Study was conducted in the Department of Ophthalmology and Department of Medicine, MLB medical college, Jhansi, Uttar Pradesh, India over a period of 12 months from July 2017 to June 2018. The procedures followed were in accordance with the ethical standards committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000. The necessary permission from the Ethical and Research Committee was obtained for the study.

Inclusion Criteria:

All newly diagnosed cases of diabetes mellitus (irrespective of age, sex, type, duration of disease) were included.

Exclusion Criteria:

Diabetic patients (i) who had other systemic diseases like hypertension, Renal disease, Tuberculosis and coagulopathies etc. (ii) those having history of any previous intraocular surgery except, Cataract surgery were excluded from study.

Results

Table 1: Distribution of patients according duration of diabetes wise distribution of patients in study

Durations of diabetes	**Number of patients**	**Percentage**	**No. of patients Ocular complications**	**Percentage**
Up to 1 year (New)	143	16.12%	93	10.49%
1-5 years	335	37.77%	197	22.21%
5- 10 years	217	24.46%	169	19.05%
10-15 years	128	14.43%	96	10.82%
More than 15 years	64	7.22%	48	5.41%
Total	887	100%	603	67.98%

Out of 887 patients 603 had diabetes related ocular manifestations.524 were male and rest 308 were female (M:F ratio was 1.7:1).-Maximum number of patients had diabetes from 1-5 years of duration followed by 5-10 years. Minimum 64 patients had diabetes with more than 15 years of duration (Table 1). Only 35.32% patients were educated and rest 64.68% were uneducated. Among the educated one only 14.26% patients were highly aware about diabetes related ocular complications (Table 2). Most common ocular manifestation was diabetic retinopathy (48.70%) followed by cataract (38.22%), Meibomitis (31.91%), dry eye (15.33%) and glaucoma (4.62%) etc. (Table 3).

Table 2: Various ocular manifestations in diabetic patient

Ocular manifestations	No. of patients	Median duration of DM In years (Range)	Percentage
Diabetic retinopathy (NPDR, PDR. CSME)	432	5-6 years	48.70%
Cataract	339	4-5 years	38.22%
Meibomitis	283	3-5 years	31.91%
Dry eye	136	5-7 years	15.33%
Neovascularization of Iris	65	8-10 years	7.33%
Glaucoma	41	6-10 years	4.62%
Keratopathy	37	6-8 years	4.17%
Retinal occlusive diseases	21	7-10 years	2.37%
Optic neuropathy	14	7-10 years	1.58%
Ocular movement disorder and ptosis	09	10-15 years	1.01%

NPDR- Non proliferative diabetic retinopathy, PDR- Proliferative diabetic retinopathy, CSME- Central serous macular edema

Table 3: Educational status of the patients who had ocular complications (n=603)

Educational status	No. of patients		Percentage
Educated	213		35.32%
	Highly aware	Poorly aware	
	86 (14.26%)	127 (21.06%)	
Uneducated	390		64.68%
	Highly aware	Poorly aware	
	132 (21.89%)	258 (42.78%)	
Total	603		100%

Discussion

In this study the male and female ratio was 1.7:1. The male female ratio was totally depends on patients who were attended the diabetic clinic and wished to ocular examination. Muninarayana et al showed that prevalence was quite more among the males than female's i.e 71% and 29% respectively.[11] In this study most of the patient had diabetes with 1-5 years of duration (37.77%), followed by 5-10 years duration (24.46%). The newly diagnosed (also included DM within one year of duration) cases were 16.12%. 64 (7.22%) patients had diabetes more than 15 years of duration. In our study, Diabetic retinopathy (48.70%) was the major ocular complication in peoples with diabetes. This association strongly supported by various study i.e Rowe NG, et al: and Klein BE, et al.[12-13] In this study, the age related diabetic retinopathy (NPDR, PDR and CSME) was main confounding factor which altered the incidence of ocular manifestation among peoples with diabetes. A hospital based study showed prevalence of retinopathy was 47.3%.[14] A cross-sectional study carried out in Al- Ain city, United Arab Emirates (UAE), the prevalence of Diabetic retinopathy among diabetic peoples was only 19%.[15] According to a study of Iran, prevalence of retinopathy was 37%.[16] Other ocular complications were Meibomitis (31.91%), Dry eye disease (15.33%), NVI (7.33%), Glaucoma (4.62%), Keratopathy (4.17%), Retinal occlusive disease (2.37%), and Optic neuropathy (1.58%). In this study, least common complication was ocular movement disorder (including ptosis) i.e. (1.01%). In a study by Watanabe K, 1% of patients with diabetes were found to have cranial nerve palsies.[17]

In our study out of 603 (n-peoples with DM with ocular complications), 390 (64.68%) patients with ocular complications were uneducated, among them 258 (42.78%) patients were poorly aware about diabetes and its complications. 35.32% patients were well educated, 21.06% patients were poorly aware.

Conclusion

Due to lack of knowledge & awareness, delayed diagnosis and treatment the prevalence of diabetes and its ocular consequences are drastically increased in this region. We have to communicate with diabetic and pre-diabetic

peoples about proper key factors to control these complications.

In this study we concluded that the most common ocular complications were Diabetic retinopathy (most common serious complication), Cataract, Meibomitis, and Dry eye disease. Other least common but serious complications were NVI, Glaucoma, Keratopathy, Retinal occlusive disease, Optic neuropathy, Ocular movement disorder (including Ptosis).

Conflict of Interest: None.

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