

# A Study of Ocular Manifestations of Diabetes Mellitus

Dr. Sravani Chava<sup>1</sup>, Dr. N.Lakshmi Chowdary<sup>2</sup>

<sup>1</sup>MS Ophthalmology, RI Medical College and General Hospital, Guntur, Andhra Pradesh, India.

<sup>2</sup>MS Ophthalmology, NRI Medical College and General hospital, Guntur, Andhra Pradesh, India.

**Summary:** This study included hundred patients with diabetes attending NRI Medical college OPD with ocular complications of diabetes in one or both eyes. Eighty three cases had diabetic retinopathy while forty cases had cataract. Corneal ulcer and extraocular muscle palsy was noted in four cases each. Neovascular glaucoma was present in two cases. Xanthelasma are present in four cases and blepharitis in two cases. Anterior ischaemic optic neuropathy (AION) was noted in one case. The most notable complications seen with increased duration of diabetes was NPDR (seen in 61.5% subjects with diabetes for 6-10 year duration). Awareness should be improved among diabetics regarding need for good diabetes control and regular eye check-up to reduce the risk of severe visual loss from diabetic retinopathy.

**Abstract: Background & Objectives:** To study the common ocular complications in diabetes and to determine ocular complications relating to duration of diabetes. **Methods:** Study included hundred patients attending ophthalmology out patient department in NRI medical College and Hospital with ocular complications of diabetes in one or both eyes during (October 2011- December 2012). **Results:** Eighty three cases had diabetic retinopathy while forty cases had cataract. Corneal ulcer and extraocular muscle palsy was noted in four cases each. Neovascular glaucoma was noted in two cases, AION was noted in one case. Blepharitis noted in two cases & Recurrent sty was noted in one case. The most notable complication seen with increased duration of diabetes was NPDR (seen in 50% subjects with diabetes for 1-10 year duration). Increased incidence of CSME was noted as the duration of diabetes increased (3.8% of subjects with diabetes in the duration range of 6- 10yrs had CSME while 26.6% of subjects with diabetes in the duration range of >20 years had CSME). **Interpretation & Conclusion:** Diabetic retinopathy was the commonest ocular complication of diabetes, followed by cataract, corneal ulcer, Extraocular muscle palsy. The prevalence of diabetic retinopathy was higher in patients with longer duration of diabetes.

**Keywords:** Diabetes mellitus, Diabetic retinopathy.

## 1. Introduction

Diabetes mellitus may be defined as primary disorder of carbohydrate metabolism, secondarily involving the protein and fat metabolism characterized by hyperglycemia and glycosuria. Its gravest ocular manifestation, diabetic retinopathy is the most frequent and may be the earliest demonstrable evidence of complications of diabetes. An endeavor has been made in this monogram to deal with every aspect of this subject such as relation of duration of diabetes, diabetic retinopathy, anterior segment complications, age incidence.

## 2. Aims and Objectives

- To study the ocular manifestations of diabetes mellitus.
- To determine ocular complications relating to duration of diabetes.

## 3. Materials and Methods

100 Diabetic patients attending NRI hospital in Chinakani from October 2011- December 2012 were studied. Patient details like demographic details, Diabetic disease details and clinical findings were recorded as per the proforma. The clinical examination included visual acuity recording, slit lamp examination and dilated posterior segment examination (90D and direct ophthalmoscopy). All patients with type 1 and type 2 diabetes mellitus were included in the

study. All patients with gestational diabetes were excluded from study.

## 4. Results

In our study 50% are males and 50% are females. 50-69 years formed the major age group (Table 1). 96% are of NIDDM and 4% are IDDM. Among the visual impaired 40% of the patients had 6/6-6/12 in right eye and 36% in left eye (Table 2). Among lenticular change the posterior sub capsular cataract change had a maximum prevalence of 26% in right eye and 21% in left eye (table 4). The highest incidence of cataract was found in 50-59 years age group. Among the vitreous complication, vitreous hemorrhage was seen in 8% patients (table 5). Prevalence of mild NPDR constituted the major group of 26% in right eye and 24% in left eye (table 6). Among 100 patients studied, incidence of mild NPDR is more in cases with duration of diabetes 6-10 years and severity of retinopathy is increasing with duration of diabetes (table 7). In optic disc changes, AION was present in 1% of the patients (table 8).

The most notable complication seen with increased duration of diabetes was NPDR (seen in 50% subjects with diabetes for 1-10 years duration). Increased incidence of CSME was noted as the duration of diabetes increased (3.8% of subjects with diabetes in the duration range of 6-10yrs had CSME while 26.6% of subjects with diabetes in the duration range of >20 years had CSME (table 9).

**Table 1: Age Prevalence**

Age	Percentage
11-29	1%
30-49	34%
50-69	57%
70-89	8%
TOTAL	100%

Diffuse	11	11%	15	15%
Aphakia	01	1%	01	01%
Pseudophaki	12	12%	14	14%

**Table 2: Range of Visual Acuity**

Visual Acuity	Right eye	Percentage	Left eye	Percentage
6/6-6/12	40	40	36	36
6/18-6/36	33	33	33	33
6/60-CF 3 mtr	21	21	27	27
CF 3 mtr-PL	5	5	3	3
Not tested	1	1%	1	1%

**Table 5: Vitreous Complications**

Vitreous	Right eye	Percentage	Left eye	Percentage
Clear	86	86%	86	86%
Vitreous Hemorrhage- fundus visible	05	05%	06	06%
Vitreous Hemorrhage- fundus not visible	01	01%	02	02%
Sub hyaloid Hemorrhage	07	07%	01	01%
Asteroid hyalosis	01	01%	05	05%
Fundus Not visible	0	0%	0	0%

**Table 3: Duration of Diabetes**

Years	Number	Percentage
1-5	24	24%
6-10	35	35%
11-15	26	26%
16-20	08	08%
>20	07	07%

**Table 6: Retinopathy Changes**

Retinal finding	Right eye	Percentage	Left eye	Percentage
No Retinopathy	17	17%	18	18%
Mild NPDR	26	26%	24	24%
Moderate NPDR	17	17%	18	18%
Severe NPDR	11	11%	17	17%
Early PDR	09	09%	05	05%
High risk PDR	13	13%	13	13%
CSME	10	10%	13	13%

**Table 4: Lenticular Changes**

Lens	Righ	Percentag	Lef	Percentag
Clear	50	50%	49	49%
PSCC	26	26%	21	21%

**Table 7: Duration of Diabetes and Associated Retinopathy**

Duration of DM	No retinopathy	Mild NPDR	Moderate NPDR	Severe NPDR	Early PDR	High risk PDR	Fundus not seen	Total
1-5	16	15	12	2	0	3	0	48
6-10	7	23	14	14	0	11	1	70
11-15	8	10	10	7	13	4	0	52
16-20	2	2	5	1	2	4	0	16
>20	2	2	0	6	0	4	0	14
Total	35	52	41	30	15	26	1	200

**Table 8: Optic Disc Changes**

Optic disc	Right eye	Percentage	Left eye	Percentage
Normal	99	99%	0	0%
Papillopathy	0	0%	0	0%
AION	01	01%	0	0%
Not visible	0	0%	0	0%

**Table 9: Showing Correlation between duration of Diabetes and Associated Ocular Complication**

Diagnosis		Duration of diabetes (years)				
		1-	6-10	11-15	16-20	>20
NPDR	Frequency	15	26	15	5	4
	%	50%	50%	34%	29.4%	26.6%
PDR	Frequency	2	6	11	4	2
	%	6.6%	11.5%	25%	23.5%	13.3%
CSME	Frequency	2	2	7	4	4
	%	6.6%	3.8%	15.9%	23.5%	26.6%
Cataract	Frequency	8	14	11	4	5
	%	26.6%	26.9%	25%	23.5%	33.3%
Others	Frequency	3	4	1	0	0
	%	10%	7.7%	2.27%	0%	0%

## 5. Discussion

### Ocular complications and their frequency of occurrence

In the present study we found retinopathy to be the most common ocular complication occurring in diabetes subjects (83%). The prevalence of cataract was 40% followed by corneal ulcer(4%) and extra ocular muscle palsy (4%). The prevalence of diabetic retinopathy varied from 28.8% in persons who had diabetes for less than five years to 77.8% in persons who had diabetes for 15 or more years in a study conducted by Klein et al <sup>(1)</sup>. Diabetes is the underlying cause in 25-30% of patients aged 45 years and older who develop acute extra ocular muscle palsy (Rush JA) <sup>(2)</sup>. In a study by Watanabe K, 1% of patients with diabetes were found to have cranial nerve palsies, compared with only 0.13% of control subjects <sup>(3)</sup>.

In this study most of the patients were found to be in the age group of 50-69 years (32%). The average age of the patients studied was 54.26 years. Comparable age distribution was found in a study by Raheja <sup>(4)</sup>.

In the present study 50 patients were male while 50 patients were female. We found association between sex and ocular

complication of diabetes mellitus wherein cataract was more common in female diabetes patients (44%) as compared to male patients (36%). Similar increased prevalence of cataract was reported in female diabetes patients in a study by Raman <sup>(7)</sup>. In our study the prevalence of NPDR was higher in female diabetes patients (70%) than in male diabetes patients (60%). This is similar to Wisconsin Epidemiological study of Diabetic Retinopathy which found higher prevalence of Diabetic Retinopathy in females <sup>(1,5)</sup>.

In the present study incidence of cataract was found to be 40%. The highest incidence of cataract was found in the 50-59 years age group. Cataract was more common in female patients (44%). Increased incidence of cataract in female diabetic patients was also noted similarly in a study by Harding JJ et al <sup>(6)</sup> and Raman <sup>(7)</sup>.

In our study 75% of patients with type 1 diabetes mellitus had NPDR while 64.6% of patients with type 2 diabetes mellitus had NPDR. The prevalence of NPDR was higher in type 1 diabetes subjects, while the prevalence of PDR was equal in both the types of diabetes (25%). This result is in contrast to the results obtained by Muawyah <sup>(8)</sup> which might be due to less number of patients with type 1 diabetes mellitus in the present study. We found 17.7% of type 2 diabetes subjects having CSME while 50% with type 1 diabetes had CSME. The prevalence of maculopathy was remarkably high (42% in type 1 and 53% in type 2 diabetic patients) in a study conducted by Zander et al <sup>(9)</sup>. In this study we found a significant correlation between duration of diabetes and associated ocular complication. The most notable complication seen with increased duration of diabetes was NPDR (seen in 61.5% subjects with diabetes for 6-10 year duration). Increased incidence of retinopathy with increase in duration of diabetes (type 1 and type 2) was noted in studies conducted by Klein *et al* <sup>(10)</sup> and Yanko *et al* <sup>(11)</sup>.

## 6. Conclusion

Diabetic retinopathy was the commonest ocular complication of diabetes, followed by cataract and corneal ulcer. Non proliferative diabetic retinopathy was more common in type 1 diabetes subjects as compared to type 2 diabetes subjects. Proliferative diabetic retinopathy was equal in both type 1 and type 2 diabetes mellitus. Prevalence of diabetic retinopathy was higher in patients with longer duration of diabetes. Prevalence of CSME increased with increased duration of diabetes.

## 7. Disclosure Statement

I certify that all co-authors have read the final manuscript within their respective areas of expertise and participated sufficiently in the study to take responsibility for it and accept its conclusions

## 8. Source of funding: None

## 9. Conflicts of interest: None

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