

Study of non retinal manifestations of type II diabetes mellitus

Ankita Kulkarni^{1*}, V H karambelkar², D K Sindal³

¹Junior Resident, ²Professor, ³Professor and HOD, Department of Ophthalmology, Krishna Institute of Medical Sciences, Karad, Maharashtra, INDIA.

Email: jm17111990@gmail.com

Abstract

Aims and Objectives: To study the non- retinal manifestations of type 2 diabetes mellitus, to study the incidence of the ocular manifestations in type 2 diabetes mellitus, to study the correlation between the incidence and the various types of ocular manifestations associated with type 2 diabetes mellitus. **Methodology:** This is a hospital based cross sectional study of 200 patients diagnosed having type 2 diabetes mellitus with various ocular manifestations conducted in tertiary care hospital. **Observation and Results:** In our study cataract was the most common manifestation seen followed by dry eye and cranial nerve palsies. Most of the patients had poorly controlled blood sugar levels and most manifestations were seen in patients with poor blood sugar levels along with longer duration of diabetes mellitus.

Key Word: retinal manifestations, DM.

*Address for Correspondence:

Dr. Ankita Kulkarni, Junior Resident, Department of Ophthalmology, Krishna Institute of Medical Sciences, Karad, Maharashtra, INDIA.

Email: jm17111990@gmail.com

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INTRODUCTION

Diabetes mellitus is one of the most common metabolic disorder occurring in the world. Twenty years back the proportion of diabetics was 1 in 25,000 people, however the ratio today is 1 in 25 people. Diabetes mellitus is a metabolic disorder characterized by increase in blood sugar levels. It has significant morbidities owing to macrovascular as well microvascular complications. Diabetic retinopathy is the most well known complication of diabetes and one of the leading cause of blindness. However a range of non- retinopathic ocular diseases associated with diabetes which are also associated with vision loss have not been studied as much. These observations indicate that there is a need to highlight the frequencies, clinical presentations and further progress of these conditions. Hence patients with diabetes may

benefit from knowledge of these associated conditions and are thus able to ensure adequate and timely referral and treatment.

MATERIALS AND METHODS

Patients attending ophthalmology OPD in the Tertiary care hospital who are diagnosed with type 2 diabetes mellitus were included in the study. Data was collected using interview, clinical examination and laboratory investigations (fasting blood sugar levels, post prandial sugar level, glycosylated hemoglobin etc.) Detail demographic profile of the patients including age, gender, ethnic group and duration of diabetes mellitus diagnosed was undertaken

OBSERVATIONS AND RESULTS

A hospital based cross-sectional study was conducted of 200 patients to assess non-retinal ocular manifestations of type 2 diabetes mellitus.

Table 1: Distribution of patients according to Control of Diabetes

Blood Sugar Level	N	%
Controlled Sugar	60	30%
Uncontrolled Sugar	140	70%
Total	200	100%

60 (30%) patients had controlled sugar levels while 140 (70%) had uncontrolled sugar levels.

Table 2: Distribution of patients according to Duration of DM

Duration of DM	N	%
<5 years	46	23%
5-10 years	116	58%
>10 years	38	19%
Total	200	100%

46 (23%) patients had DM was <5 years while 116 (58%) and 38 (19%) patients had DM for 5-10 and >10 years respectively.

Table 3: Anterior segment manifestations observed in patients

Ocular manifestations	N	%
Cataract	116	58%
Dry Eye	66	33%
Recurrent chalazion	4	2%
Cranial nerve palsies	4	2%
Cellulitis	2	1%
Iridocyclitis	2	1%
Recurrent Hordeolum externum	2	1%
Rubeosis Iridis	1	0.5%
Primary angle closure glaucoma	1	0.5%
Corneal ulcer	1	0.5%
Mucormycosis	1	0.5%

Table 4: Correlation of Duration of DM and Mean age of Patients with Cataract

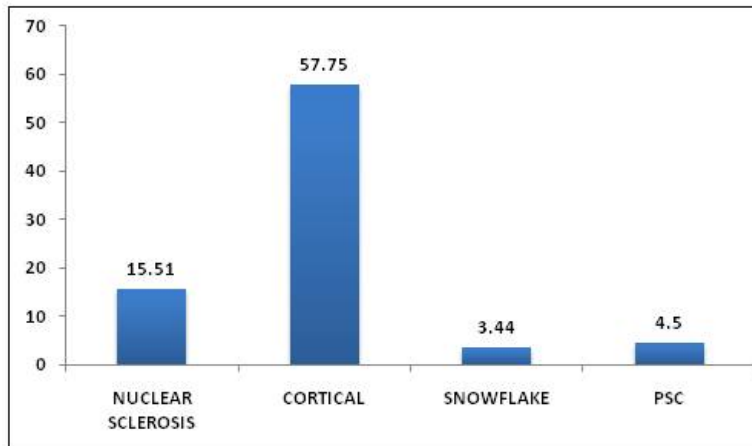
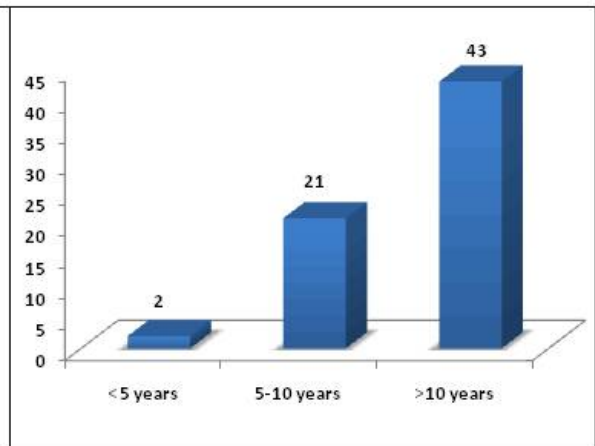
Duration of DM	Mean Age of Cataract	p Value
<5 years	58.6	p<0.05
5-10 years	51.5	
>10 years	42.5	

The mean age of patients with cataract who had DM for <5 years was 58.6 years while it was 51.5 years and 42.5 years for patients with cataract who had DM for 5-10 years and >10 years respectively. There was significant association of duration of DM and mean age of patients with cataract (p<0.05).

Table 5: Mean Correlation of Age and HbA1c

Age Group In Years	Mean HbA1c
41-50	7.80 %
51-60	6.50 %

Association of mean age of cataract in Type 2 diabetes mellitus is correlated with HbA1c levels here in Table No 11. There was no significant difference found between the two parameters

**Graph 1****Graph 2****Legend**

Graph 1: Types of Cataract observed in patients **Correlation of Duration of Diabetes Mellitus (DM) and Mean age of Patients with Cataract**

Graph 2: Correlation of Duration of DM and Incidence of Dry Eye

In graph 1, The most common ocular manifestation is Cataract (58%) followed by Dry eye (33%), Recurrent chalazion(2%) and Cranial nerve palsies (2%). In the current study we observed 1% cases with Cellulitis, Iridocyclitis and Recurrent Stye. Rubeosis Iridis, Primary angle closure glaucoma, Corneal ulcer and Mucormycosis were also present in 0.5% cases.

In graph 2, Two patients with dry eye had DM for <5 years while 21 and 43 patients with dry eye had DM for 5-10 years and >10 years respectively. There was significant association of duration of DM and incidence of dry eye (p<0.05).

DISCUSSION

A hospital based cross-sectional study was conducted with 200 patients to assess non-retinal ocular manifestations of type 2 diabetes mellitus. Physician awareness is essential in reducing the incidence of visual loss in patients with Diabetes Mellitus. A Range of Ocular manifestations leading to visual loss is associated with diabetes. In our study, 60 (30%) patients had controlled sugar levels while 140 (70%) had uncontrolled sugar levels. 46 (23%) patients had DM was <5 years while 116 (58%) and 38 (19%) patients had DM for 5-10 and >10 years respectively.

ChavaS *et al*⁷ study on ocular manifestations and determine ocular complications relating to duration of diabetes reported among lenticular changes posterior sub-capsular cataract change had a maximum prevalence. The Highest incidence of cataract was found in 50-59 years age group. The Most common ocular manifestation was Cataract (58%) followed by Dry eye (33%), Recurrent chalazion (2%) and Cranial nerve palsies (2%). A range of Ocular manifestations leading to visual loss is associated with diabetes. In the current study we observed 1% cases with Cellulitis, Iridocyclitis and Recurrent Sty. Rubeosis Iridis, Primary angle closure glaucoma, Corneal ulcer and Mucormycosis were also present in 0.5% cases. The Blue Mountains Eye Study⁸ showed that impaired fasting glucose, in the absence of clinical diabetes, was also a risk factor for the development of cortical cataract. Negahban K *et al*⁹ study observed additional evidence that the risk of cataract increases with increasing diabetes duration and severity of hyperglycemia. The mean age of patients with cataract who had DM for <5 years was 58.6 years while it was 51.5 years and 42.5 years for patients with cataract who had DM for 5-10 years and >10 years respectively. There was significant association of duration of DM and mean age of patients with cataract ($p < 0.05$). KathiaraA *et al*¹⁶ study reported most common ocular finding amongst diabetics was found to be cataract-58.33% (35 patients). Klein BE *et al*^{10,11} in a Wisconsin Epidemiologic Study of Diabetic Retinopathy and Beaver Dam Eye Study reported Diabetic patients were 2-5 times more at risk for cataract formation and are more likely at an earlier age. Although cataract frequency varies based on ethnic populations and geographic locations (ranges from 35% to 48%), it is higher in diabetics when compared to non-diabetics.¹²⁻¹⁶

In a Retinopathy Epidemiology and Molecular Genetics Study by Raman R *et al*²⁰ it has been indicated that the mixed cataract was more common than mono type cataract (42% vs 19%, respectively). A combination of cortical, nuclear, and posterior sub-capsular cataract was the most common form of the mixed types (20%), followed by the combined posterior subcapsular cataract and cortical (16%). Among the monotype cataracts, rate of cortical cataract was the highest (15%), followed by nuclear cataract (5%) and posterior subcapsular cataract (1%). Bron AJ *et al*¹⁷ on the other hand reported cataract frequency varied from 1% to 27% in patients with type 1 diabetes. 2 patients with dry eye had DM for <5 years while 21 and 43 patients with dry eye had DM for 5-10 years and >10 years respectively. There was significant association of duration of DM and incidence of dry eye ($p < 0.05$). The reported prevalence of Dry Eye Syndrome in diabetics is 15-33% in those over 65 years of age and increases with age and is 50% more common in women

than in men²². HomM *et al*¹⁸ study reported that 53% of patients with either diabetes or borderline diabetes had self-reported, clinically relevant dry eyes. Manaviat MR *et al*¹⁹ in a hospital-based study reported 54% of those with diabetes had Dry Eye Syndrome and there was a significant correlation between Dry Eye Syndrome and the duration of diabetes. This suggests that examination for dry eye should be an integral part of the ocular examination in patients with diabetes. Dry Eye seems to be an important contributing factor related to corneal abnormalities. Good glycemic control is important for prevention and control of dry eye syndrome.

1 and 3 patients with cranial nerve palsy had DM for 5-10 years and >10 years respectively. There was no significant association of duration of DM and incidence of dry eye ($p > 0.05$).

Godwin AE *et al*²⁰ prospective study reported Cataract was the commonest anterior segment complication (123), while non-proliferative retinopathy was the commonest posterior segment complication (120). Systemic complication was reported in 17 (7.8%). Coexisting glaucomatous disc cupping was seen in 25 patients.

Diabetes control and complication trial²¹ and United Kingdom prospective diabetic study²² both showed that intensive blood glucose control retards the rate of progression of diabetic retinopathy

CONCLUSION

A wide spectrum of non-retinal ocular manifestations other than diabetic retinopathy are seen in diabetes mellitus. Whereas diabetes may be only one of the many risk factors for other conditions or it can be a sole cause for the disease, or it can be contributory in the pathogenesis of ocular manifestations. The management of ocular manifestations in diabetes mellitus is mainly preventive. A regular examination of the eye and timely referral reduces risk of diabetes induced visual loss. Most of the cases present as gradual deterioration of vision; however in some cases, where visual deterioration is sudden, an acute surgical or laser intervention may be required. Our study suggests the need for awareness regarding diabetes mellitus, as inspite of good counselling, awareness campaigns, maximum patients in our study (70% patients) had uncontrolled blood sugar levels.

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