



THE NON RETINAL MANIFESTATIONS OF TYPE II DIABETES MELLITUS

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Authors VHK and AK designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors AK and GG managed the analyses of the study. Author AP managed the literature searches. All authors read and approved the final manuscript.

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Case study

ABSTRACT

Introduction: Diabetes mellitus is one of the most common metabolic disorder occurring in the world.

Aim: Aim of the study is to study the various non-retinal ocular manifestations associated with T-II diabetes mellitus.

Methodology: A cross-sectional study was conducted with 200 patients to assess non retinal ocular manifestations of T-II diabetes mellitus. 65% patients were male while female patients constituted 35% of the study population.

Conclusion: 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.

Keywords: Type II diabetes mellitus; non retinal manifestation; retinopathy.

1. INTRODUCTION

Diabetes mellitus is one of the most common metabolic disorder occurring in the world. India has 31.7 million diabetic subjects and this number is expected to increase to a staggering 79.4 million by 2030. Twenty years back the

proportion of diabetics was 1 in 25,000 people, however the ratio today is 1 in 25 people. That is almost a 1000 percent rise in diabetics. Diabetes mellitus is a metabolic disorder characterized by increase in blood sugar levels. It has significant morbidities owing to macrovascular as well microvascular complications.

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1.1 Primary Objective

To study the non retinal manifestations of type 2 diabetes mellitus.

1.2 Secondary Objective

To study the distinct non-retinal ocular symptoms associated with type 2 diabetes mellitus.

2. REVIEW OF LITERATURE

Type II diabetes is described by insulin obstruction and normally relative (absolute) insulin deficiency. Most patients with type II diabetes are stout. Ketoacidosis rarely happens precipitously. These patients are at increased risk of creating macrovascular complexities. Insulin secretion is blemished in these patients and inadequate to compensate for the insulin obstruction.

2.1 Ocular Manifestations

Manifestations are present in nearly every portion of the orbit alongwith lids. Diabetic retinopathy [1,2] has found place in a number of recent literature. Tortuosity and dilatation of veins are segment of the microvascular irregularities observed in diabetes [3]. Corneal irregularities like superficial punctate keratitis, chronic corneal erosion, persistent epithelial lesions, and corneal endothelial injury are most frequently seen in patients with diabetes mellitus [4]. A few studies have demonstrated expanded corneal thickness in diabetic patients [5-7] and persistent corneal edema after cataract extraction and vitrectomy, not owing to epithelial imperfections, proposing irregular capacity of the corneal endothelium [8,9]. Diabetic patients have additionally been found to have decreased corneal affectability as a component of generalized peripheral neuropathy [10]. Despite the non - specific aspect of the injury and the subjectivity of the calculation, corneal sensitivity is an interesting parameter to be taken into account in diabetic patients. Touzeau O et al. [11] With retinopathy, the length and regulation of diabetes are essential factors in cataract growth and management [12]. In one study, 987 (53 per cent) patients had cataracts in one or both eyes [13-14]. The relationship among diabetes mellitus and glaucoma in

the studies is uncertain. Many studies have not identified an association [15] although others in Australia have found that the prevalence of open-angle glaucoma in people with diabetes is higher than in the general population [16].

3. 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.). All patients diagnosed as having type 2 diabetes mellitus. All patients were personally interrogated thoroughly and a detailed history was taken including the past history and of ocular complaints was also questioned. All the patients had blood sugar values at first visit.

A detailed and meticulous physical examination was done and recorded in the proforma. Relative investigations as advised by the attending physician were carried out and their reports noted.

4. OBSERVATIONS AND RESULTS

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

As seen in Table 1, 60 (30%) patients had controlled sugar levels while 140 (70%) had uncontrolled sugar levels.

According to Table 2, It was observed that 40% patients had 6/6-6/12 in right eye and 36% in left eye while 34% patients had 6/18-6/36 in right eye and 34% in left eye.

As seen in Table 3, The most common ocular manifestation is 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.

Table 1. Distribution of patients according to control of diabetes

Blood Sugar Level	No. of Respondent	%
Controlled Sugar	60	30%
Uncontrolled Sugar	140	70%
Total	200	100%

Table 2. Range of visual acuity of patients

Visual Acuity	Right eye		Left Eye		p Value
	N	%	N	%	
6/6 – 6/12	80	40%	72	36%	0.404
6/18 – 6/36	68	34%	68	34%	
6/60 – CF 3 mtr	42	21%	54	27%	
CF 3 mtr - PL	10	5%	6	3%	
Total	200	100%	200	100%	

Table 3. Anterior segment manifestations observed in patients

Ocular manifestations	No. of respondent	%
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%

5. DISCUSSION

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.

Chava S et al [17] study on ocular manifestations and determine ocular complications relating to duration of diabetes reported 50% are males and 50% are females. 50- 69years formed the major age group.

In our study, 65% patients were male while 35% patients were female. Similar sex distribution wherein males outnumbering females was found in a study conducted by Al-Bdour M Det al [18]. Comparable results with regard to increased incidence of diabetic ocular manifestations in male patients were found in a study by Gupta S et al [19].

Chava S et al [17] study on ocular manifestations and determine ocular complications relating to duration of diabetes reported among the visual impaired 40% of the patients had 6/6-6/12 in right eye and 36% in left eye. 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.

Prabhakar N et al. [20] hospital based cross sectional study on frequency of occurrence of different ocular manifestation in patients with diabetes mellitus reported Anterior segment manifestations in male patients were Lids xanthelasma 4, Recurrent chalazion 14, Tortuous conjunctival blood vessel 2, Corneal ulcer 6, Iridocyclitis 9, Rubeosis Iridis 3, Primary angle closure glaucoma 2, Primary open angle glaucoma 18. Secondary glaucoma-neovascular 4, Cataract 217 whereas in female patients were Lids xanthelasma 10, Recurrent chalazion 10, Tortuous conjunctival blood vessel 6, Corneal ulcer 10, Iridocyclitis 6, Rubeosis Irides 5, Primary open angle glaucoma 7, Primary angle closure glaucoma 37, Secondary glaucoma neovascular 6, Cataract 259.

Diabetes regulation and complication trial [21] and the UK prospective diabetic study [22] both found that intensive blood glucose control delays the rate of progression of diabetic retinopathy.

6. CONCLUSION

In addition to diabetic retinopathy, a broad spectrum of non-retinal ocular conditions is seen in diabetes. Some of these disorders tend to be casually related to hyperglycemia and diabetes, while diabetes can be only one of several risk factors for other diseases. In addition, there are a host of retinal disorders that mimics common signs of diabetic retinopathy. The management of ocular manifestations in DM is mainly preventive. A regular examination of the eye and timely reference to an ophthalmology unit reduces the risk of diabetes induced visual loss. Most of the cases present as gradual loss of vision; however in some cases, where visual loss is sudden an acute surgical or laser interventions 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 had uncontrolled blood sugar levels.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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