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## DIABETES MELLITUS; INCIDENCE OF RETINOPATHY

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### ABSTRACT

This study was conducted in hundred patients with diabetes mellitus of either sex and between 10-90 years of age, presenting in diabetic clinic and medical unit –I of Allied Hospital Faisalabad. The disease duration was 1 month to 22 years and out of these, 22 were taking insulin and 78 were on oral hypoglycaemic agents. Among these patients, 42 had findings of diabetic retinopathy with overall incidence of 42%. Out of these 42 patients, 38 had background retinopathy while 4 had proliferative retinopathy with 24(51.14%) males and 18(31.03%) females. The incidence of retinopathy was higher in patients with 60 years of age or above and with diabetes of duration of 10 years or more. Out of 100 patients, 12(54.54%) and 30(38.46%) were found to have diabetic retinopathy respectively. From this study, it was concluded that the incidence of diabetic retinopathy in our population is quite high and it is increased with duration of the disease. Also that the incidence is higher in patients with IDDM as compared to NIDDM and is seen in both sexes and in all age groups.

## INTRODUCTION

Diabetes mellitus is a syndrome characterized by hyperglycaemia and disturbances of carbohydrate, fat and protein metabolism, associated with absolute or relative deficiencies in insulin secretion and / action. It is one of the commonest clinical endocrine disorder which is responsible for very high morbidity and mortality all over the world. About one fourth of all diabetic patients have Insulin Dependent Diabetes Mellitus (IDDM) while three fourth of these have Non – Insulin Dependent Diabetes

Mellitus (NIDDM). It affects both sexes and all age groups.

Diabetes mellitus spares no organ and system of the body and produces both acute and chronic complications. The major complications are macro-vascular & micro-vascular disease. Microvascular disease leads to increased prevalence of coronary artery disease, peripheral vascular disease & stroke. Microvascular disease results in diabetic retinopathy and contributes to nephropathy.

Diabetes can affect the eye in a number of ways. The most common and characteristic form is diabetic retinopathy which is the most common cause of blindness in United States<sup>1</sup>. The incidence of blindness is 20 times greater in diabetics than in non-diabetics and about 2% of all diabetics become blind<sup>2</sup>.

The incidence of diabetic retinopathy seems to vary with age of onset as well as duration of disease. Retinopathy appears to develop earlier in older patients but proliferative retinopathy is less common. Some 10-18% of simple retinopathy progresses to proliferative disease in 10 years and about half of patients with proliferative disease progress to blindness within 5 years.

The prevalence of diabetic retinopathy is higher in IDDM (40%) than in NIDDM (20%). Proliferative retinopathy is more common in IDDM<sup>1</sup> and is the most common cause of blindness in individuals between 20-65 years of age<sup>3</sup>. Despite the recent improvement in diabetic care and confirmation that good glycaemic control reduces the risk of microvascular complications, diabetic retinopathy still remains the leading cause of blindness in working population<sup>4</sup>.

This study was conducted to find the incidence of retinopathy in patients with DM attending medical outdoor, diabetic clinic and admitted in medical unit-I.

## MATERIAL & METHODS

This study was carried out in medical unit-I and diabetic clinic of Allied Hospital Faisalabad in 100 patients with diabetes mellitus, irrespective of duration of illness, age, sex and therapy used.

The study comprised of three steps:

1. A detailed history was taken from all patients.
2. A detailed ophthalmologic examination was done and findings noted at the time of examination.
3. Evidence of retinopathy was looked for in previous record where it was available.

Diagnosis of retinopathy was based on the following criteria:

A. Background retinopathy

- (a). Capillary closure and dilatation
- (b). Micro-aneurysms
- (c). Arteriovenous nipping
- (d). Hard exudates
- (e). Cotton wool or soft exudates

B. Proliferative retinopathy

- (a) Neovascularization
- (b) Scarring
- (c) Vitreous haemorrhage
- (d) Retinal detachment

The relationship between retinopathy and risk factors other than diabetes mellitus was not studied.

RESULTS

The 100 patients selected for the study were between 10-90 years of age, with majority in 30-60 year age group. Out of 100, 58 were females and 42 were males using either insulin(22) or oral hypoglycaemic agents(78). The duration of disease was 1 month to 22 years.

Among 100 patients, 42 had the findings of retinopathy; 38 had background retinopathy and 4 with proliferative retinopathy. Out of these 42 patients, 24(57.14%) were males and 18(31.03%) were females. In age group 10-30, 3(37.5%) out of 8 had retinopathy while in age group 31-40, 7(35%) out of 20 were affected. In age group 41-50, 7(35%) out of 20 had the changes of retinopathy and in age group 51-60, 15(42.85%) out of 35 were affected. In age group 61-70, 7(50%) out of 14 were affected and in age group 71 and above, 3(100%) out of 3 had retinopathy(Table-I).

Table-I. Incidence of diabetic retinopathy according to the age of patients

Age (yrs)	No. of Pts	Pts with Retinopathy (%)
10-30	8	3 (3.75%)
31-40	20	7 (35%)
41-50	20	7 (35%)
51-60	35	15 (42.85%)
61-70	14	7 (50%)
> 70	3	3 (100%)
Total	100	42

According to duration of disease, 54 had diabetes of 5 or less than 5 years and 15(27.7%) were found affected. In 6-10 years duration, 10(45.45%) out of 22 were affected and in 11-15 years duration group, 11(64.70%) out of 17 had retinopathy while in duration group 16 years or more, 6(85.71%) out of 7 had the changes of retinopathy(Table-II).

Table-II. Incidence of retinopathy according to the duration of illness

Duration of illness	No. of Pts	Pts with retinopathy
1-5	54	15 (27.7%)
6-10	22	10 (45.45%)
11-15	17	11 (64.70%)
16 & above	7	6 (85.71%)
Total	100	42

Out of 100 patients, 22 were on insulin therapy and 12(54.54%) out of these had retinopathy while the other 78 patients were taking oral hypoglycaemic agents and retinopathy was present in 30(38.46%) out of these 78 patients(Table-III).

Table-III. Incidence of retinopathy in patients taking insulin and oral hypo glycaemic agents

Drug used	No. of Pts	Patient with retinopathy
Insulin	22	12 (54.54%)
Oral hypo-glycaemic	78	30 (38.46%)
Total	100	42

Table-IV-Incidence of retinopathy in patients taking antidiabetic drugs regularly and Irregularly		
Drug Taking	No. of Pts	Pts with retinopathy (%)
Regular	35	14 (40)
Irregular	65	28 (43.07)
Total	100	42

In our study sample, 35 out of 100 patients were taking their antidiabetic drugs regularly and 14(40%) out of these had findings of retinopathy whereas the 65 patients who were not taking their medicines regularly, 28 out of these had diabetic retinopathy(Table-IV).

## DISCUSSION

In many developing countries such as Pakistan, education about diabetes and its complications is lacking at all levels from patient, his family and the community at large to health personnel and resource allocators. This is largely because of the poor appreciation of the problems, lack of expertise, shortage of manpower and absence of literature and equipment facilities for such education.

Diabetic retinopathy is a leading cause of blindness in the United States<sup>1</sup>. It is also an important cause of blindness in Pakistan. A 1981 estimate of blindness in Pakistan irrespective of the cause gave a prevalence of 2.4%, resulting in a total of 1447400 people with a visual acuity of less than 1/60<sup>5</sup>. The incidence of retinopathy in patients with DM shows variations in different parts of the world. According to the study conducted at Joslin clinic<sup>6</sup>, incidence of retinopathy is 25% in patients with DM; 7% in patients with diabetes of < 10 years duration, 26% in 10-14 years duration and 63% in those with diabetes of 15 years or more.

In Pakistan, Dr. Akhtar Jamal observed in Karachi that out of 3000 diabetic patients 780(26%) had retinopathy(7). In another study by Dr. Samina Jahangir at Lahore in PMRC in 1989, out of 50 patients with diabetes, 30(60%) had diabetic retinopathy<sup>8</sup>. In various population based studies in different parts of the world, including Australia<sup>9</sup>, Denmark<sup>10</sup>, Ireland<sup>11</sup> and United States<sup>12</sup>, it had been shown that the prevalence of diabetic retinopathy varies between 24-70%. In our study, 42% of patients with diabetes had findings of diabetic

retinopathy. It is very much comparable to other local as well as international studies. The incidence of retinopathy increased with age and duration of diabetes. It was maximum in patients with diabetes of 15 years or more (85%) and in age group 50-70 years. This is also comparable to other studies conducted in other parts of the world<sup>6</sup>.

Our study showed high incidence of retinopathy in patients with IDDM than those with NIDDM(54.54% and 38.48% respectively). It was also observed that patients who were taking antidiabetic drugs regularly, had retinopathy with incidence of 40% whereas those who were careless about the control of diabetes and were taking medicines irregularly had incidence of 43.87%. These results also favour to the studies by Pirat<sup>13</sup> and DCCT(Diabetic Control And Complication Trial<sup>14</sup>) that good glycaemic control reduces the microvascular complications.

## CONCLUSIONS

Although the study sample was small so, while drawing conclusions someone should be a bit cautious, following conclusions can be drawn from this study:

1. The incidence of retinopathy in our population is quite high.
2. The incidence of diabetic retinopathy increases with the duration of disease.
3. Diabetic retinopathy is seen in both sexes and almost all age groups.
4. Incidence of diabetic retinopathy is higher in type-I as compared to type-II diabetic.

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