

# STATUS OF DIABETIC RETINOPATHY AND ITS PRESENTATION PATTERNS IN DIABETICS AT OPHTHALOMOLOGY CLINICS

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## ABSTRACT

**Objective:** To determine the status of Diabetic Retinopathy (DR) and reasons for presentation at the time of initial ophthalmological examination of diabetic individuals.

**Methodology:** It was a descriptive study performed at the Department of Ophthalmology, Hayatabad Medical Complex, Peshawar and at Saeed Anwar Medical Center, Dabgari Garden Peshawar from July 2014 to June 2015. All diabetics (both type 1 & 2), who presented for the first time to ophthalmologist were included in our study. Diabetic retinopathy was classified according to Early Treatment Diabetic Retinopathy Study (ETDRS) classification as mild, moderate, severe and very severe non proliferative diabetic retinopathy (NPDR) and proliferative diabetic retinopathy (PDR). Patients with vitreous hemorrhage, rubeosis iridis, neovascular glaucoma or tractional retinal detachment were classified as having advanced diabetic eye disease (ADED).

**Results:** A total of 360 eyes of 180 diabetic patients were included in the study. At presentation, 13.05 % of eyes had mild NPDR, 23.62% had moderate NPDR, 8.80% had severe NPDR, 3.12 % had very severe NPDR, 16.68 % had PDR and 3.34 % had ADED.

**Conclusion:** Majority of diabetic patients had some form of diabetic retinopathy at the time of presentation to the ophthalmologists.

**Key Words:** Diabetes mellitus, Diabetic retinopathy, Non-proliferative diabetic retinopathy, Proliferative diabetic retinopathy

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## INTRODUCTION

Diabetic retinopathy (DR) is the main cause of decreased vision and blindness in patients with diabetes throughout the world<sup>1,2</sup>. The incidence of diabetic population is increasing and is estimated to be 439 million in 2030<sup>3</sup>. Prevalence of diabetes is increasing at an alarming rate in low and middle income countries<sup>4</sup>. Currently Pakistan is ranking six in term of diabetic population and will progress to 5<sup>th</sup> in 2030 with 13.9 million affected people leading to expected increased incidence of diabetic retinopathy<sup>5</sup>.

Currently in a population of 180 million in Pakistan, about 7 million people are suffering from diabetes<sup>6</sup>. In comparison with other parts of the world the prevalence of diabetes in Pakistan in adult population range from 8.6% to 13.9%<sup>5</sup>. Diabetic retinopathy is now the 5<sup>th</sup> leading cause of blindness worldwide and is the main cause of blindness in working population<sup>6</sup>. Blindness due to diabetic retinopathy is more common in type 1 diabetics (4%) than in type 2 (1.6%)<sup>4</sup>. Uncontrolled and prolonged duration of diabetes causes micro-vasculop-

athy. Hence both are risk factors for common complications like retinopathy, neuropathy and nephropathy. Diabetic retinopathy causes irreversible visual loss and often presents late due to lack of symptoms.

According to American Diabetes Association (ADA), 21% of diabetic patients have retinopathy at presentation and about 60% develop it within two decades after diagnosis<sup>7</sup>. As visual loss due to diabetic retinopathy is avoidable, it is important that every effort should be made to diagnose and treat the patients promptly and at proper time. To achieve this goal, all patients with diabetes needs proper counseling regarding control of risk factors and follow-up.

Unfortunately due to unavailability of local studies and surveys, we have to rely on evidence provided by international studies which may not be applicable to our population due to different socioeconomic circumstances, illiteracy, access and availability of eye care services. Therefore we designed this study to provide local data regarding frequency and status of DR at presentation to ophthalmologists. The reasons and features due

to which they presented were also recorded. Our results will be shared with professionals and authorities related to eye care so that better strategies can be planned to combat blindness related to DR.

## METHODOLOGY

It was a descriptive study conducted after approval of Institutional Ethical Committee at the Department of Ophthalmology, Hayatabad Medical Complex, Peshawar and in a private setup in Saeed Anwar Medical Center, Dabgari Garden, Peshawar from 1<sup>st</sup> July 2014 to 30<sup>th</sup> June 2015. All known diabetics or patients who were later on diagnosed as diabetics as per ADA criteria who presented for the first time to ophthalmologist during study duration (one year) were included in the study after availing informed consent.

In all patients a detailed history was taken from the patients regarding diabetes and reasons due to which they presented to ophthalmologists. After thorough history, all patients underwent complete ocular examination including best corrected visual acuity, pupillary examination and Intra ocular pressure (IOP) measurement. All patients were examined by slit-lamp examination and dilated fundus examination using 78D was performed.

Diabetic retinopathy was classified according to Early Treatment Diabetic Retinopathy Study (ETDRS) classification as mild, moderate, severe and very severe non-proliferative diabetic retinopathy and proliferative diabetic retinopathy. Patients were classified as having advanced diabetic eye disease when they develop complications of proliferative diabetic retinopathy like vitreous hemorrhage, rubeosis iridis, neovascular glaucoma or tractional retinal detachment. Patients were classified as having diabetic maculopathy if there was leakage from microaneurysms, exudation or hemorrhages at macula. The term clinically significant macular edema (CSME) was used if there was retinal thickening within 500  $\mu$ m of the center of the macula or exudates within

500  $\mu$ m of the center of the macula (if associated with adjacent edema) or retinal thickening of one disc area or larger, any part of which is within one disc diameter of the center of the macula. Variables were expressed in numbers and percentages. SPSS version 17 was used for data analysis.

## RESULTS

A total of 360 eyes of 180 diabetic patients were included in the study. Age distribution among the patients was analyzed (Table 1). Mean age was  $49 \pm 11.81$  years. The number of male patients were 106 (58.9%) and female patients were 74 (41.1%).

Out of 180 patients, 10% (18) were having type 1 diabetes mellitus and 90% (162) were having type 2 dependent diabetes mellitus. A Total of 247 (68.61%) of eyes were having features of diabetic retinopathy at presentation.

Classification of DR was done as per ETDRS and we found that 13.05 % had mild NPDR, 23.62% had moderate NPDR, 8.80% had severe NPDR, 3.12 % had very severe NPDR, 16.68 % had PDR and 3.34 % had advance diabetic eye disease.

Grading of diabetic retinopathy with which diabetic patients presented for the first time is shown in the Table 2. Diabetic maculopathy was found in 43.33% of eyes at presentation. Eye wise distribution is shown in Table 3. Out Of 360 eyes, 87 (24.17 %) eyes had clinically significant macular edema (CSME) on presentation (Table 4).

Out of 180 patients, 30% of the patients presented to the ophthalmologists with ocular features related to diabetes like decrease visual acuity because of retinopathy, lenticular changes, floaters and pain due to neo-vascular glaucoma. The reasons and features with which the patients presented to ophthalmologist are shown in the Table 5.

**Table 1: Age distribution (n=180)**

Age	Frequency	Percentage
21-30 years	6	3.33%
31-40 years	39	21.67%
41-50 years	40	22.22%
51-60 years	58	32.23%
61-70 years	37	20.55%
Total	180	100%

**Table 2: Grading of diabetic retinopathy (n=360)**

Stages of DR	Right Eye	Left Eye	Total
No DR	54 (15.00%)	59 (16.36%)	113 (31.39%)
Mild NPDR	23 (6.38%)	24 (6.66%)	47 (13.05%)
Moderate NPDR	41 (11.39%)	44 (12.22%)	85 (23.62%)
Severe NPDR	18 (5.00%)	14 (3.39%)	32 (8.80%)
Very severe NPDR	6 (1.68%)	5 (1.39%)	11 (3.12%)
PDR	34 (9.46%)	26 (7.27%)	60 (16.68%)
ADED	5 (1.39%)	7 (1.97%)	12 (3.34%)

**Table 3: Diabetic maculopathy**

Diabetic Maculopathy	Right Eye	Left Eye	Total	Percentage
Yes	80	76	156	43.33%
No	99	105	204	56.67%
Total	179	181	380	100%

**Table 4: Clinically significant macular edema (CSME), (n=360)**

CSME	Right Eye	Left Eye	Total	Percentage
Yes	51	36	87	24.17%
No	127	146	273	75.83%
Total	178	182	360	100%

**Table 5: Presentation patterns of patients (n=180)**

Presentation	Number	Percentage
Diabetic Ocular Features	54	30.0%
Other features related to Diabetes (CRVO, BRVO)	11	6.11%
Other Symptoms	62	34.44%
Referred by physician/ Endocrinologist	35	19.45%
Referred by GP	7	3.89%
Know about Diabetic Retinopathy	11	6.11%
Total	180	100%

Note: CRVO= Central retinal vein occlusion, BRVO= Branch retinal vein occlusion

## DISCUSSION

Our study was the first hospital based study to find out the severity of diabetic retinopathy at presentation in the province of Khyber Pukhtunkhwa. Our study showed that 68.61 % of eyes were having diabetic retinopathy at presentation and in the remaining fundoscopy was normal. Out of these patients with diabetic retinopathy, 16.68 % of eyes were having PDR at presentation. Our study also showed that 43.33 % of eyes were having diabetic maculopathy at presentation (24.17% % having CSME).

In a study by Verma et al<sup>8</sup>, it was reported that 25% of the patients have DR after 5 years of diabetes, 60%

after 10 years and 80% after 15 years revealing the fact that the duration of diabetes is a strong predictor of retinopathy progression. In a study by Tan and Lai<sup>9</sup> they reported the presence of diabetic retinopathy at presentation to be 58.9% which is lower than that of our results. It may be because of the reason that due to lack of proper health education our patients are not going for routine examination and presents to ophthalmologist when they developed symptoms related to complications of diabetic retinopathy. There is general agreement that the severity of DR depends upon the duration of diabetes and the severity of hyperglycemia. Once the retinopathy starts then glycemic control is more important factor than duration of diabetes<sup>10</sup>. According to American Diabetes Association the recommendation

for HbA1c level is 7% or less to reduce the chances of retinopathy progression<sup>11</sup>. Our study results showed that only 24% were referred by general practitioners, physicians and endocrinologists. It is also interesting to note that patients who presented with symptoms or complications related to DR were 36% and about 34% presented with features not related to DR (they came for availing treatment for symptoms due to other eye pathologies).

Diabetic retinopathy is a common cause of blindness but unfortunately, most of the patients are unaware of the risk factors and complications of diabetic retinopathy. Although DR related blindness is preventable but only if prompt treatment is done at proper time. This can only be achieved if early diagnosis of DR is attained. Therefore it is essential for diabetic care providers (including general practitioners, physicians and endocrinologists) to educate diabetics regarding DR and refer them to ophthalmologists as per standard protocol.

To achieve the objective of early referral, diabetic care Professionals needs to be aware of DR and the ultimate blindness related to DR. At the same time, proper coordination between ophthalmologists and diabetic care providers is need of day. Such integrated approach will surely help to combat huge challenge and socio-economic consequences related to DR related blindness, which our country has to face in the near future. Although our study provided a valuable data but had limitations of being hospital based with limited sample size so it may not be the actual reflection of what is happening in our community.

## CONCLUSION

Majority (2/3<sup>rd</sup>) of diabetic patients had some form of diabetic retinopathy at the time of presentation to the ophthalmologists. Approximately 2/5<sup>th</sup> had diabetic maculopathy at presentation. One fourth of patients were referred by general practitioners, physicians and endocrinologists. Approximately one third of diabetics presented with symptoms or complications related to DR and about one third presented with features not related to DR.

## RECOMMENDATIONS

Community based surveys and studies with proper sample size need to be designed and performed under the influence and support of health authorities for better future planning to prevent DR related blindness and visual impairment in our community.

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## CONTRIBUTORS

SJ conceived the idea, planned the study, did data collection and data analysis. IA and SK did data collection, statistical analysis and drafted the manuscript. ZH, MR and MAS did literature search, statistical analysis and critically revised the manuscript. All authors contributed significantly to the submitted manuscript.