

AWARENESS DIABETIC RETINOPATHY AMONGST KNOWN DIABETICS

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ABSTRACT

Objective: To study awareness regarding Diabetic Retinopathy (DR) amongst established diabetics.

Material and Methods: This cross-sectional observational study was done at Department of Diabetes and Endocrinology, Hayatabad Medical Complex Peshawar, Pakistan with technical support from Khyber Institute of Ophthalmic Medical Sciences, Peshawar. Two hundred and two indoor patients were interviewed and duration of diabetes, drugs taken for the control of diabetes, history of any previous eye examination was recorded. Later dilated fundoscopy was done by endocrinologist and finally all the patients were sent for independent assessment by an ophthalmologist for categorizing DR and if needed laser was done for the affected eyes.

Results: Of 202 patients only 9(4%) patients had optimum diabetic control with HbA_{1c} of <7. Ninety four (47%) had previous eye examination while 108(53%) had never had their eyes examined. Of those examined 77(81.9%) had been seen by ophthalmologist, 13(13.8%) by physician/endocrinologist and only 4(4.3%) by general practitioners (G.Ps). Dilated fundoscopy showed 118(58%) patients had retinopathy. Thirty eight (18.8%) patients were offered laser treatment after appropriate investigations.

Conclusion: Screening and awareness of DR amongst patients is particularly low in our setup. We need to increase awareness amongst our patients regarding this complication of diabetes.

Key Words: Diabetes complications, Diabetic Retinopathy (DR), Ophthalmoscopy.

INTRODUCTION

Diabetes mellitus is one of the commonest chronic disorders known today. Its prevalence has been rising to an epidemic level and if current trends continue, by year 2025 more than 300 million people world over will be suffering from this disease.¹ In the developing world in general and in Pakistan in particular this is even worse. Pakistan is estimated to have 12 million diabetics by year 2025 of which type 1 diabetes will account for only 3-4 percent.² As more and more people are affected with diabetes and with poor metabolic control, treating physicians, diabetologists and ophthalmologists are seeing diabetics with multiple complications. Diabetic Retinopathy (DR) is the most serious chronic complication of diabetes mellitus and leading cause of blindness among adults in industrialized countries.³ Prevention of diabetes related blindness rests upon primarily improving control of blood glucose and blood pressure.⁴⁻⁶ It is now accepted that early detection of retinopathy and subsequent treatment with laser should reduce the incidence of blindness due to diabetes, if screening is done in the community.^{7,8}

In Pakistan situation is no different and diabetic retinopathy continues to rise⁹ with subsequent rise in diabetes related blindness. This rise is primarily due to poor metabolic control with less than optimum glycaemic, lipid and blood pressure control, which are the primary targets for preventing complications related to diabetes.¹⁰ Scenario is even worse due to lack of education and medical infrastructure, where patients are not screened by GPs or at primary health care centre routinely leading to a huge burden on tertiary care hospitals.

We conducted this study in a tertiary care hospital at Department of Diabetes and Endocrinology to see how many patients referred to hospital have got diabetic retinopathy with relationship to duration of the disease. Also it was studied as to how many patients were screened previously and were aware of their retinopathy before being seen in the hospital.

MATERIAL AND METHODS

This study was done at Department of Diabetes and Endocrinology, Hayatabad Medical

CATEGORIES OF DIABETIC RETINOPATHY. (DR)

Category-1	Category-2	Category-3
Diabetic Retinopathy	Pre-Proliferative Diabetic Retinopathy.	Proliferative Diabetic Retinopathy
Absent	Micro aneurysms(MA) Haemorrhages (Hs) Hard Exudates (HE)	Neo-vascularization at disc (NVD)
	Cotton wool spots (CWS) Venous Beading (VB)	Neo-vascularization elsewhere (NVE)
	Intraretinal micro aneurysms (IRMA)	NVD+ NVE
		Tractional Retinal Detachment (R/D)
		Vitreous haemorrhage
		Rheg R/D
		Adv. With Iris NV

Table 1

complex Peshawar, Pakistan with technical support from Khyber Institute of Ophthalmic Medical Sciences, Peshawar.

This was an observational cross-sectional study. To ensure that all the data is complete, a proforma was used along with the history sheet. A complete history was taken from the patient with special reference to duration of diabetes, treatment taken at the time of presentation. Any previous co-morbid related conditions in isolation or in any combinations were recorded including hypertension, ischaemic heart disease, previously known hyperlipidaemias, smoking and foot ulcers. Age and body mass index (BMI) were recorded and complete physical examination was carried out including dilated funduscopy in the department using 1% tropicamide eye drops. Blood sample was taken for lipid profile and Glycosylated Haemoglobin (HbA_{1c}).

Blood was analyzed for HbA_{1c} using High Performance Liquid Chromatography (HPLC) technique. HbA_{1c} values were divided into four categories with 7% or less in category 1, 7.1%-8% in category 2, 8.1%-10% in category 3 and above 10% in category 4. Patients were asked specific questions regarding previous eye examination and questions as to who performed

eye examination, whether they were informed about the eye pathology and that if they received any treatment for eyes in the past. A dilated fundus examination was done in the department and was categorized as no retinopathy, pre-proliferative diabetic retinopathy (PPDR) and proliferative diabetic retinopathy (PDR). Patients were then referred to Ophthalmology department for further assessment, where visual acuity and further detailed fundus examination was carried out using slit lamp. Examination was divided into three categories of diabetic retinopathy (Table 1). Diabetic maculopathy was recorded as oedematous, exudative, ischaemic and no maculopathy. Depending on the findings any patient requiring fundus fluorescein angiography (FFA) was referred for further detailed examination and those requiring laser at the end of assessment were booked for appropriate laser therapy.

All the coded data was transferred to SPSS 10 version for analysis using stata 7. Frequencies and descriptive analysis were calculated. Chi Square test were applied for comparison of two categorical variables.

RESULTS

A total of 202 consecutive patients were entered in this study. Seventy three (36%) were

RELATIONSHIP OF GLYCEAMIC CONTROL WITH DURATION OF DIABETES

Duration	HbA _{1c} Levels				Total
	< 7%	7-8%	8-10%	> 10 %	
< 5years		11(16.2%)	39(57.4%)	18(26.5%)	68(100.0%)
6-10 years	7(11.5%)	9(14.8%)	32(52.5%)	13(21.3%)	61(100.0%)
> 10 years	2(2.7%)	13(17.8%)	36(49.3%)	22(30.1%)	73(100.0%)
Total	9(4.5%)	33(16.3%)	107(53.0%)	53(26.2%)	202(100.0%)

Table 2

P value: 0.065

RELATIONSHIP OF DURATION OF DIABETES WITH PREVIOUS OPHTHALMIC EXAMINATION

Duration	Previous ophthalmic Examination		Total
	Not Done	Done	
< 5years	30 (44.1%)	38 (55.9%)	68 (100.0%)
6-10 years	23 (37.7%)	38 (62.3%)	61 (100.0%)
> 10 years	41 (56.2%)	32 (43.8%)	73 (100.0%)
Total	94 (46.5%)	108 (53.5%)	202 (100.0%)

Table 3 P-value: 0.091

males and 129(64%) were females. Mean age of males was 52 years (SD-12) and females was 49 years (SD-11). Body Mass Index (BMI) was calculated with the formula weight (kg) /Height(m²). BMI was categorized in three categories , category one 25 as normal weight, category two 26-29 as overweight and category three 30 as obese. One hundred and fifteen (57%) of the patients were in category one, 52 (26%) in category two and 35(17%) in category three. Sixty eight (34%)of the patients had diabetes for upto 5 years, 61(30%) patients had diabetes for 6-10 years of duration while 73(36%) had diabetes for more than a decade. 100(50%) patients were receiving insulin, 51(25%) were receiving one or two oral anti-diabetic drugs and 51(25%) were receiving combination of insulin and oral anti-diabetic drugs for the control of their diabetes.

119(59%) patients were suffering from hypertension or were receiving treatment for it, 41(20%) were receiving antilipid therapy for previously known hyperlipidaemias and 17(8%) patients had previous established ischaemic heart disease. Diabetic control as described earlier was divided into four categories according to HbA_{1c} levels. 9(4%) patients were in category 1, 33(16%) in category 2, 107(53%)in category 3 and 53(27%) in category 4. Relationship of Glycosylated

FREQUENCY OF TYPES OF DIABETIC RETINOPATHY AS SEEN BY OPHTHALMOLOGIST

Diabetic Retinopathy	Frequency	Percentage
No Retinopathy	84	41.6
MA, Hgs, HE	67	33.2
CWS, V B	26	12.9
IRMA	9	4.5
NVD	4	2.0
NVE	4	2.0
NVD + NVE	7	3.5
Vitreous Hemorrhage	1	.5
Total	202	100.0

Table 4

FREQUENCY OF PATIENTS REQUIRING LASER THERAPY

	Frequency	Percentage
Laser done	38	18.8
Laser not done	164	81.2
Total	202	100.0

Table 5

Haemoglobin to duration of diabetes is given in table 2. 94(47%) had their eyes examined in the past while 108(53%)patients never had their eye examined since the diagnosis of diabetes. Relationship of duration of diabetes to previous examination of eyes is given in table 3.

Of those who had had their eyes examined 77(81.9%) been seen by an ophthalmologist, 13(13.8%) patients had been seen by a physician and only 4(4.3%) patients had their eyes seen by their GP in the past. 65(32.1%) received some sort of treatment for their eyes and they were the patients who's eyes were seen by an ophthalmologist. 46(23%) patients were informed about their eye condition out of the total of 202 patients examined in this study. After a dilated fundus examination by an Endocrinologist, 77(38%) patients had NPDR, 41(20%) patients had PDR and 84(42%) patients didn't show any signs of diabetic retinopathy. An ophthalmologist later saw all the patients where diagnosis of retinopathy was further confirmed and elaborated. 84(42%) patients were confirmed to have no retinopathy while 118(57%) patients had some kind of retinopathy according to predefined classification (table 4). Maculopathy was recorded separately and 162 (80%) patients didn't show any maculopathy while 24(12%) of patients had exudative maculopathy and 16(8%) patients had ischaemic or oedematous maculopathy. Laser treatment was given to 38(18.8%) patients as given in (table 5). Frequency of previous eye examination and type of examiner is given in table 6 and 7. Awareness regarding retinopathy in previously examined is given in table 8.

DISCUSSION

Pakistan is a developing country and like many other developing nations health and education are

FREQUENCY OF PATIENTS PREVIOUSLY EXAMINED FOR RETINOPATHY.

Previously Examined	94 (46.5%)
Previously not Examined	108 (53.5%)
Total	202 (100%)

Table 6

PREVIOUS SCREENING DONE FOR RETINOPATHY BY TYPE OF EXAMINER.

	Frequency
Ophthalmologist	77 (81.9%)
Physician/Endocrinologist	13 (13.8%)
GP	4 (4.3%)
Total	94 (100.0%)

Table 7

the two main priorities, which need most attention. Until few years ago the main stress in Pakistan was on prevention of blindness due to cataracts as it was thought to be the most important cause of blindness unlike the western society where diabetic retinopathy is the leading cause of blindness.¹¹ Looking at diabetes prevalence figures of Pakistan,^{12,13} it is not a surprise that we will soon find ourselves burdened under the load of complications of diabetes particularly Diabetic Retinopathy, which has already burdened the western society.

It has been previously shown by different studies from this part of the world that diabetic control is poor generally,¹³ and thus resulting complications are high.¹⁴⁻¹⁶ In our study most of the patients were poorly controlled diabetics. HbA_{1c} of less than 7 is now generally regarded as target to be achieved in most of the western countries in order to minimize microvascular complications.¹⁰ Also it was observed in our study that 119(58.9%) of the patients were hypertensive or were receiving treatment for it, thus adding an additional risk factor for development of diabetic retinopathy.

Cooperation between diabetics and health care workers is of prime importance for the proper management of diabetes.^{17,18} Patients perception about their disease, diabetic retinopathy and their own role in controlling these problems have rarely been explored. Pasagian-Macaulay et al. reported that many patients were unaware that retinopathy may be asymptomatic and that visual loss can be prevented.¹⁹ Trento M. et al. studied two group of patients from different countries in whom standard diabetes care was provided by general practitioners and or specialist in a diabetic clinic, and found that spontaneous health perceptions and beliefs as well as internal control mechanisms may not be appropriately developed to allow useful co-operation with personnel screening of DR. In our study 94(47%) patients had had their eyes examined in the past while 108(53%) had not had their eyes screened for DR in the past. Of particular concern is that group of patients (no=73) who had diabetes for more than 10 years. Only 56% of these patients had their eyes examined in

AWARENESS OF RETINOPATHY AMONGST PREVIOUSLY SCREENED DIABETICS.

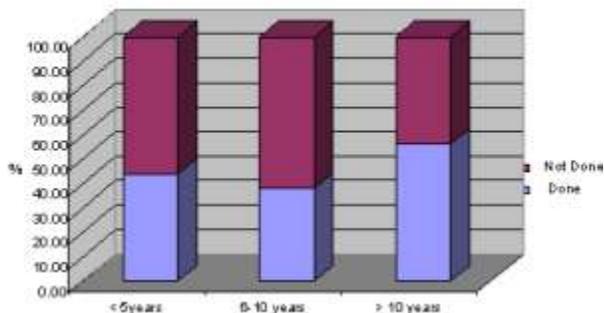
Informed	46 (48.9%)
Not Informed	48 (51.1%)
Total	94 (100.0%)

Table 8

the past, while 32(44%) never had their eyes seen in the past 10 years and were first seen by endocrinologist in the department where study was carried out. Also it was shown in our study that most of the patients who were seen in the past as regards to eye examination were seen by ophthalmologist 77(81.9%), while only 13(13.8%) were seen by physicians and 4(4.3%) by general practitioners(G.Ps). It is important to establish at this point as to what kind of referral system exists for diabetic patients in our setup for appropriate screening and referring to the tertiary care facilities.

It was also noted in our study that out of 94 patients who had been previously screened prior to this consultation, only 46(48.9%) were informed about their eyes condition. This constitutes 23% of the total studied sample which was 202. Although most of it could be attributed to illiteracy of the patients but here an important observation is noticed that having had the screening for DR, patients were infact not informed by the doctor. This leads us to a new discussion that how much education is imparted to the diabetics who is diabetic. Trento M et al reported the model for long term systemic group education is effective in improving knowledge of diabetes, health behaviours, quality of life and preventing worsening metabolic control over two years in people with type2 diabetes²¹. The group care approach appears to have been effective also in developing appropriate knowledge and behaviours for the prevention of diabetes related visual impairment and in shifting the locus of control more internally. This seems to be the answer in our setting where we are dealing with a population in which illiteracy is high and doctors or educators (if any) haven't got much time to spare to the individuals. Group education in these circumstances may be a way forward. The issue of educating our patients becomes more important because when seen by an endocrinologist 38(18.8%) patients were found to have DR which needed laser treatment. These were the patients who with established uncontrolled diabetes were in the community with sight threatening DR. In our study it was also noted that patients having seen by endocrinologist were referred for detailed ophthalmic examination and all the patients who didn't have any DR were confirmed by ophthalmologist < p=0.00.

RELATIONSHIP OF DURATION OF DIABETES WITH PREVIOUS OPHTHALMIC EXAMINATION



Duration of Diabetes Figure 1

It was also shown in our study that duration of diabetes has had no bearing that the patients will be screened for retinopathy. (Fig. 1). This is obvious from the fact that there is no formal screening programme and referral system as discussed earlier doesn't exist.

There is now well-established and effective retinal screening programme for patients with diabetes in most of the western world.²²⁻²⁴ Most of these programmes involve primary care physicians. Screening is done with the help of minimal man power using mobile fundus cameras, mydriatic or non mydriatic ophthalmoscopy or photography. All these efforts are directed for early detection and appropriate referral to the ophthalmologist so that sight-threatening DR can be dealt with appropriately. This may be some thing we need to focus on to establish centres where fundus photograph is taken by a trained technician and later reviewed by ophthalmologist or an endocrinologist. There is no doubt that diabetes care needs to be more streamlined and requires a team of physicians, dieticians, diabetologists, ophthalmologists, nephrologists, a vascular surgeon in addition to a well developed referral system comprising of general practitioners, diabetes educators and public health workers . Only this could help us focussing on preventing complications by early detection and appropriate referral. There is now reasonable evidence that retinal photography can be an effective tool for screening purposes to detect sight threatening diabetic eye disease (STDED) and that it is more sensitive than direct ophthalmoscopy.²⁵⁻²⁸ Adding retinal photography to ophthalmoscopy increases screening sensitivity.²⁹ Our data shows limitation because it was a hospital based study and sample size was relatively small. Perhaps a broader epidemiological study needs to be done to evaluate the status of DR and also awareness amongst diabetic population regarding this complication.

The strength of our study is the cross check by an ophthalmologist, who independently

confirmed or refuted the diagnosis of DR.

CONCLUSION

We need to formulate a strategy where screening is done at large and may be modern tools of screening like retinal cameras can be used. Further epidemiological large scale studies may substantiate and give more insight into the problem.

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