

Frequency of Diabetic Retinopathy in Newly Diagnosed Diabetic Patients

Khawaja Muhammad Mujtaba, Syed Saqlain Abbas, Umar Farooq and
Ambar Fawad Khan

ABSTRACT

Objective: To determine frequency of retinopathy in newly diagnosed diabetic patients in Nishtar Hospital Multan.

Study Design: Cross sectional Study

Place and Duration of Study: This study was conducted at the Outpatient Department of Nishtar Hospital Multan from May 2016 to March 2017.

Materials and Methods: A total of 171 newly diagnosed patients with type II were included in study. Diagnosis of diabetes was done on the basis of history, physical examination and laboratory tests including blood sugar levels, HbA1c, lipid profile, serum creatinine and albumin and urine complete examination. Waist hip ratio and body mass index were calculated. Detailed eye examination was carried out. Visual acuity measurement and slit lamp examination were performed to diagnose diabetic retinopathy.

Results: Of these 171 study cases, 91 (53.2 %) were male and 80 (46.8 %) were female patients. Mean age of our study cases was 50.52 ± 5.90 years. Mean blood sugar level was 241.35 ± 32.95 mg/dl and mean HBA₁C level was 8.17 ± 0.23 . Of these 171 study cases, 58 (33.9%) were hypertensive patients while family History of diabetes was present in 93 (54.4%) of our study cases. Only 4 (2.3 %) of our study cases reported that they had undergone eye examination since diagnosis of Diabetes mellitus. Retinopathy was seen in 31 (18.1 %) of our study cases.

Conclusion: High frequency of retinopathy is observed among newly diagnosed diabetic patients. Very low rate of eye examination was noted among these patients. Newly diagnosed diabetic patients should be emphasized the importance of regular eye examination to avoid this complication. Furthermore this retinopathy was significantly more common in male diabetic patients, increasing age and duration of diabetes. A detailed Fundoscopic examination among these patients is of paramount importance.

Key Words: Retinopathy, Diabetes mellitus, Newly diagnosed

Citation of articles: Mujtaba KM, Abbas SS, Farooq U, Khan AF. Frequency of Diabetic Retinopathy in Newly Diagnosed Diabetic Patients. Med Forum 2017;28(10):110-113.

INTRODUCTION

Diabetes mellitus is a metabolic disorder which results from defects of insulin secretion or due to impaired insulin actions resulting in elevated glucose levels with disturbance of glucose, fats and protein metabolism¹. Diabetes has now become major public health issue which is close to reach epidemic proportions globally. Retinopathy, among the different diabetic complications, is the second cause of blindness not only in industrialized countries but also in Pakistan. Different studies conducted in Pakistan have documented varying rates of diabetic retinopathy. This study was planned to be conducted among newly diagnosed diabetic patients.

Due to rapid economic growth leading to change in life style, type 2 diabetes has become common disease

these days which is defined by asymptomatic phenomenon associated with actual start of diabetic hyperglycemia and clinical diagnosis. This phenomenon is known to occur for approximately 4–7 years and 30–50% patients of the illness remain unnoticed or undiagnosed and may lead to the development of the certain related complications such as diabetic retinopathy, nephropathy and neuropathies². These complications of the diabetes are associated with lack functional activity, poor productivity, disabilities and low life expectancy among these patients⁵⁻⁷.

The prevalence of diabetes has considerably increased due to changes in life style modifications, increasing proportion of obesity in different subsets of society and longevity. According to current estimates the prevalence of diabetes will double till 2025.^{8,9}

Compared to developed countries, where it occurs late, diabetes is diagnosed quite earlier part of the life among South Asian population. Pakistan with its population over 200 million people harbors around 10 % diabetic patients which is expected to double in next 20 years^{10,11}. Diabetes patients have 25 times more possibility of becoming blind compared with their healthier counterparts and data from developed countries shows that diabetic retinopathy remains major

Department of Medicine, Nishtar Hospital, Multan.

Correspondence: Dr. Khawaja Muhammad Mujtaba,
Ex-House Officer, Department of Medicine, Nishtar Hospital,
Multan.

Contact No: 0322-6113002

Email: mujtaba9229@gmail.com

Received: May 21, 2017;

Accepted: July 20, 2017

cause of visual impairments and blindness in adults. In type II diabetic patients diabetic retinopathy has been documented to occur in more than 60 % patients within 20 years of diagnosis while in approximately 20% at the time of the diagnosis^{12, 13}.

One of the studies conducted in Pakistan showed that the frequency of retinopathy in newly diagnosed patients of type II diabetes mellitus is 12.75%¹⁴ and another showed frequency of 17%¹⁵. The purpose of this study was to determine frequency of diabetic retinopathy in newly diagnosed patients so as to prevent this complication as much as possible.

MATERIALS AND METHODS

A total of 171 newly diagnosed patients with type II diabetes (Any patient having fasting blood sugar level above 126mg/dl and random blood sugar level above 200mg/dl was considered as diabetic patient, diagnosed within last 3 months) were included in study. Sample size was calculated by using openepi.com sample size calculator with $p = 20\%$ ^{12, 13}(taking expected proportion of DR) at 95 % confidence level with $d=6\%$ margin of error. An informed consent was taken. Study was conducted in Outpatient department of Nishtar Hospital, Multan, from May 2016 to March 2017. Diagnosis of diabetes was done on the basis of history, physical examination and laboratory tests including blood sugar levels, HbA1c, lipid profile, serum creatinine and albumin and urine complete examination. Waist hip ratio and body mass index were calculated. Detailed eye examination was carried out. Visual acuity measurement and slit lamp examination were performed to diagnose diabetic retinopathy. Data obtained was entered and analyzed using SPSS version 22 and descriptive statistics was used to calculate mean and standard deviation for age and blood glucose level. Frequencies and percentages were calculated for gender and diabetic retinopathy.

RESULTS

A total of 171 newly diagnosed cases with type 2 diabetes mellitus meeting inclusion and exclusion criteria of this study were included. Of these 171 study cases, 91 (53.2 %) were male and 80 (46.8%) were female patients. Mean age of our study cases was 50.52 ± 5.90 years. Mean blood sugar level was 241.35 ± 32.95 mg/dl (ranging from 190 mg/dl to 302 mg/dl) and mean HBA₁C level was 8.17 ± 0.23 . Of these 171 study cases, 87 (50.9%) were in age group of 41 to 50 years of age while 84 (49.1%) belonged to age group of 51 to 60 years. Of these 171 study cases, 58 (33.9%) were hypertensive patients while 113 (66.1%) did not had hypertension. Family History of diabetes was present in 93 (54.4%) of our study cases while 78 (45.6%) did not had family history of Diabetes mellitus. Only 4 (2.3 %) of our study cases reported that they had undergone eye examination since diagnosis of Diabetes mellitus and

remaining 167 (97.7%) did not had any eye examination in this time period.

Table No.1: Stratification of Retinopathy with regards to gender

Regarding Gender			
Gender	Retinopathy		P-value
	Yes (n=31)	No (n=140)	
Male (n = 91)	24	67	0.003
Female (n = 80)	07	73	
Total	171		

Table No.2: Stratification of Retinopathy with regards to age.

Age groups (In Years)	Retinopathy		P- value
	Yes (n = 31)	No (n = 140)	
41 – 50 (n = 87)	11	76	0.074
51 – 60 (n = 84)	20	64	
Total	171		

Table No.3: Stratification of Retinopathy with regards to Hypertension.

Regarding to Hypertension:			
Hypertension	Retinopathy		P-value
	Yes (n = 31)	No (n = 140)	
Yes (n = 58)	12	46	0.536
No (n = 113)	19	94	
Total	171		

Table No. 4: Stratification of Retinopathy with regards to family history of Diabetes among study cases.

Family History	Retinopathy		P-value
	Yes (n = 31)	No (n = 140)	
Yes (n = 93)	15	78	0.551
No (n = 78)	16	62	
Total	171		

Table No.5: Stratification of Retinopathy with regards to previous history of eye examination.

Eye Examination	Retinopathy		P-value
	Yes (n = 31)	No (n = 140)	
Yes (n = 04)	01	03	0.554
No (n = 167)	30	137	
Total	171		

Table No.6: Mean blood glucose level with regards to Retinopathy.

Retinopathy	Blood glucose level		P-value
	Mean	Standard Deviation	
Yes (n = 31)	272.68	28.89	0.000
No (n = 140)	234.41	29.67	

Majority of our study cases i.e. 108 (63.2%) had their diabetes diagnosed for more than 45 days while 64 (36.8%) had their diabetes diagnosed for less than 45 days. Retinopathy was seen in 31 (18.1 %) of our study cases.

DISCUSSION

Retinopathy, among the different diabetic complications, is the second cause (being cataract the first) of legal blindness in the industrialized countries¹⁶. The range of results obtained from prevalence studies, mainly conducted in Anglo-saxon countries, varies from 5% to 70% in connection with the following risk factors: patient's age at the diagnosis date, duration of disease, metabolic control, arterial hypertension and lipidoproteinosis. Diabetes has now become major public health issue which is close to reach epidemic proportions globally. Retinopathy, among the different diabetic complications, is the second cause of blindness not only in industrialized countries but also in Pakistan. Different studies conducted in Pakistan have documented varying rates of diabetic retinopathy^{17, 18}. Of these 171 study cases, 91 (53.2 %) were male and 80 (46.8 %) were female patients. Similar findings have been reported by Khurram et al¹⁹.

Most of the Authors^{14,15,19-21} have reported the retinopathy being more prevalent with increasing age, our study results are in consistency with these findings. Mean age of our study cases was 50.52 ± 5.90 years (minimum age was 41 years while maximum was 60 years). Wahab et al²⁰ reported $43.2 \% \pm 10.2$ years mean age of their study participants which were newly diagnosed for Diabetes for the presence of retinopathy. Hayat et al¹⁵ reported 45.1 ± 3.2 years mean age for the newly diagnosed diabetic patients which were screened for the retinopathy. Jamil et al¹⁴ reported 50.95 ± 10.12 years mean age for the newly diagnosed diabetic patients screened for retinopathy, these findings are also in compliance with that of ours. Of these 171 study cases, 87 (50.9%) were in age group of 41 to 50 years of age while 84 (49.1%) belonged to age group of 51 to 60 years. Similar age group was predominant as reported by Jamil et al¹⁴. Family History of diabetes was present in 93 (54.4%) of our study cases while 78 (45.6%) did not had family history of Diabetes mellitus. A population based study conducted in Faisalabad reported only 3 % family history among diabetic patients²¹.

In our society, eye examination is often neglected among diabetic patients. Only 4 (2.3 %) of our study cases reported that they had undergone eye examination since diagnosis of Diabetes mellitus while a study conducted by Hussain et al²¹ reported 6% eye examination among diabetic patients in population. Retinopathy was seen in 31 (18.1 %) of our study cases. Wahab et al²⁰ reported 15 % frequency of retinopathy in type 2 diabetic patients who were diagnosed 2

months ago. These findings are very close to that of our study results as duration of diabetes was also similar in our case. Hayat et al¹⁵ reported 17 % frequency of retinopathy among type 2 diabetic patients diagnosed within 1 month. These findings are also close to that of our findings. Jamil et al¹⁴ reported 12.75% frequency of retinopathy among newly diagnosed cases of type 2 diabetes mellitus. Male gender is significantly related with diabetic retinopathy as reported in previous studies^{14, 15,19-21}, our study findings have also observed that retinopathy was being more prevalent among male diabetic patients ($p=0.003$). Similarly, diabetic retinopathy is significantly more seen in patients with longer duration of diabetes mellitus^{14, 15, 19-21}. Our study results have also observed retinopathy being significantly related with duration of diabetes ($p=0.008$).

CONCLUSION

High frequency of retinopathy is observed among newly diagnosed diabetic patients. Very low rate of eye examination was noted among these patients. Newly diagnosed diabetic patients should be emphasized the importance of regular eye examination to avoid this complication. Furthermore this retinopathy was significantly more common in male diabetic patients, increasing age and duration of diabetes. A detailed Fundoscopic examination among these patients is of paramount importance.

Author's Contribution:

Concept & Design of Study:	Khawaja Muhammad Mujtaba
Drafting:	Ambar Fawad Khan
Data Analysis:	Syed Saqlain Abbas & Umar Farooq
Revisiting Critically:	Khawaja Muhammad Mujtaba & Ambar Fawad Khan
Final Approval of version:	Khawaja Muhammad Mujtaba

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Heydari I, Radi V, Razmjou S, Amiri A. Chronic complications of diabetes mellitus in newly diagnosed patients. *Int J Diabet Mel* 2010;2: 61–3.
2. Pafili K, Papanas N, Maltezos E. Treatment of diabetic complications: how can we learn by seeking and blundering? *Angiol* 2015;66(4):301-3.
3. Rydén L, Mellbin L. Joint ESC/EASD guidelines on diabetes, where are we now and where should we go? *Curr Vasc Pharmacol* 2012;10(6):690-2.
4. Paneni F. 2013 ESC/EASD guidelines on the management of diabetes and cardiovascular

- disease: established knowledge and evidence gaps. *Diab Vasc Dis Res* 2014;11(1):5-10.
5. Paneni F, Costantino S. Diabetes and cardiovascular disease: let's push forward with translational research. *Cardiovasc Diagn Ther.* 2015;5(5):407-11.
 6. Mellbin LG, Anselmino M, Rydén L. Diabetes, prediabetes and cardiovascular risk. *Eur J Cardiovasc Prev Rehabil* 2010;17 Suppl 1:S9-14.
 7. Krentz AJ, Clough G, Byrne CD. Interactions between micro vascular and macro vascular disease in diabetes: pathophysiology and therapeutic implications. *Diabet Obes Metab* 2007;9(6): 781-91.
 8. Arinzon Z, Shabat S, Shuval I, Peisakh A, Berner Y. Prevalence of Diabetes Mellitus in elderly patients received enteral nutrition long-term care service. *Arch Gerontol Geriatr* 2008;47(3):383-93.
 9. Bethel MA, Sloan FA, Belsky D, Feinglos MN. Longitudinal incidence and prevalence of adverse outcomes of Diabetes Mellitus in elderly patients. *Arch Int Med* 2007;167(9):921-7.
 10. Shera AS, Jawad F, Maqsood A. Prevalence of diabetes in Pakistan. *Diabet Res Clin Pract* 2007;76(2):219-22.
 11. Zuberi SI, Syed EU, Bhatti JA. Association of depression with treatment outcomes in Type 2 Diabetes Mellitus: A cross-sectional study from Karachi, Pakistan. *BMC Psychiatr* 2011;11:27.
 12. Din J, Qureshi MB, Khan AJ, Khan MD, Ahmad K. Prevalence of diabetic retinopathy among individuals screened positive for diabetes in five community-based eye camps in northern Karachi, Pakistan. *J Ayub Med Coll Abbottabad* 2006; 18(3):40-43.
 13. Fong DS, Aiello LP, Ferris FL, Klein R. Diabetic retinopathy. *Diabetes Care* 2007;27(10): 2540-53.
 14. Jamil K, Iqbal Y, Zia S, Khan QA. Frequency of Retinopathy in Newly Diagnosed patients of Type-2 Diabetes Mellitus. *Pak J Ophthalmol* 2014; 30(1):38-41.
 15. Hayat AS, Khan AH, Baloch GH, Shaikh N. Frequency and pattern of retinopathy in newly diagnosed type 2 diabetic patients at tertiary care settings in Abbottabad. *J Ayun Med Coll Abbottabad* 2012;24(2):87-9.
 16. Cantagallo A. Epidemiology of diabetic retinopathy. *Ann Ig* 1989;1(3-4):591-620.
 17. Shaikh MA, Gillani S, Dur-e-Yakta. Frequency of diabetic retinopathy in patients after ten years of diagnosis of type 2 diabetes mellitus. *J Ayub Med Coll Abbottabad* 2010;22(3):158-60.
 18. Klein R, Knudtson MD, Lee KE, Gangnon R, Klein BE. The Wisconsin Epidemiologic Study of Diabetic Retinopathy XXIII: the twenty-five-year incidence of macular edema in persons with type 1 diabetes. *Ophthalmol* 2009;116(3):497-503.
 19. Khurram M, Javed M, Faheem M, Bushra HT. Diabetic retinopathy in type 2 diabetics. *J Rawalpindi Med Coll* 2013;17(2):257-9.
 20. Wahab S, Mahmood N, Shaikh Z, Kazmi WH. Frequency of Retinopathy in newly diagnosed type 2 diabetic patients. *J Pak Med Assoc* 2008;58(10): 557-61.
 21. Hussain F, Arif M, Ahmad M. The prevalence of Diabetic retinopathy in Faisalabad: a population based study. *Turk J Med Sci* 2011;41(4):735-42.