Journal of Medicine, Physiology and Biophysics
ISSN 2422-8427 An International Peer-reviewed Journal
Vol.40, 2018

FREQUENCY OF MICROALBUMINURIA IN PATIENTS WITH DIABETIC RETINOPATHY

DR. MUAZZAM ALI, MBBS

Department of Medicine,

Nishtar Hospital, Multan, Pakistan.

DR. YASIN FASEEH UR REHMAN, MBBS

Department of Medicine,

Nishtar Hospital, Multan, Pakistan.

DR. HAWWA TARIQ, MBBS

Department of Medicine,

Nishtar Hospital, Multan, Pakistan.

Abstract;
Background; The magnitude of damage caused by these microvascular complications of diabetes stresses the need for sensitive markers of screening for retinopathy and nephropathy. This study was done to determine the frequency of microalbuminuria in patients with diabetic retinopathy. **Material and methods;** A total of 300 patients' type 2 diabetic patients with diabetic retinopathy presenting in Diabetes OPD of Nishtar Hospital, Multan were selected. After taking informed written consent, all patients underwent retinal imaging using Non Mydriatic Fundus Camera (NIDEK® Model # AFC-330). Urine sample of each patient was sent to the institute pathology laboratory for measuring albumin / creatinine ratio. Grades of retinopathy and microalbuminuria. Collected Data was entered into SPSS version 17.0 and was analyzed through its statistical package. **Results;**
Of these 300 study cases, 179 (59.7%) were male patients while 121 (40.3%) were female patients. Mean age of our study cases was 52.10 ± 5.65 years (with minimum age was 42 years while maximum age was 60 years). Most of our study cases were from poor socioeconomic background i.e. 170 (56.7%) while only 13.3 % belonged to the higher socio-economic status. Majority of our study cases were having low educational level such as illiterate i.e. 60 (20%), primary education in 71 (23.7%) while only 3 % had bachelors degree or above. Mean duration of diabetes was 14.18 ± 2.73 years (with minimum duration of disease was 10 years while 19 years was maximum duration of the disease). Among these patients Grade III diabetic retinopathy was more prevalent i.e. 149 (49.7%) followed by grade IV retinopathy i.e. 100 (33.3%). Diabetes was controlled in only 81 (27%) of our study cases and obesity was present in 101 (33.7%) of our study cases. Microalbuminuria was present in 121 (40.3%) of our study cases.
Conclusion; Very high frequencies of microalbuminuria were noted in patients with diabetic retinopathy in our study. Microalbuminuria was significantly associated with female gender, increasing age, socio-economic status, low educational level, disease severity, disease duration and obesity. Microalbuminuria was not associated with control of diabetes.
Keywords; Microalbuminuria, Diabetic Retinopathy, Frequency.

Introduction:

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term

damage, dysfunction, and failure of different organs, especially eyes; kidneys, nerves, heart, and blood vessels.[1]There are three main types of diabetes mellitus (DM): Type I, Type II and gestational diabetes.[2]

The multisystem complications of diabetes such as retinopathy, nephropathy, neuropathy and cardiovascular diseases are considered important, impinging on public health.[3] Diabetic nephropathy (DN) and diabetic retinopathy (DR) are arguably the two most dreaded complications of diabetes. Together they contribute to serious morbidity and mortality. As they progress to end-stage renal disease (ESRD) and blindness, they impose enormous medical, economic, and social costs on both the patient and the health care system. Because nephropathy and retinopathy are frequently linked in patients.[4]

Both ESRD and blindness are preventable through early detection and treatment.The concordance of microalbuminuria and diabetic retinopathy has been well reported in persons with type 1 diabetes.[5, 6] However for type 2 diabetes, there is paucity of data especially from population-based studies regarding the association of microalbuminuria with diabetic retinopathy.[7-12] In a study done by Manaviat MR et al[8], positive correlation was seen between microalbiminuria and diabetic retinopathy and 25.9% patients of diabetic retinopathy had shown microalbuminuria.

Materials and methods:

A total of 300 patients' type 2 diabetic patients with diabetic retinopathy aged 40 to 60 years, having diabetic retinopathy grade II and above and duration of diabetes for more than 10 years presenting in Diabetes OPD were selected. Patients underwent any form of retinal surgery / laser therapy, patients on ACE-inhibitors or ARBs, patients have any other Kidney disease, cataract, patient having Hypertensive retinopathy were excluded from our study.

After taking informed written consent, all patients underwent retinal imaging using Non Mydriatic Fundus Camera (NIDEK® Model # AFC-330). Urine sample of each patient was sent to the institute pathology laboratory for measuring albumin / creatinine ratio. Grades of retinopathy and microalbuminuria. Collected Data was entered into SPSS version 17.0 and was analyzed through its statistical package.

Results;

Our study comprised of 300 patients having diabetic retinopathy meeting inclusion and exclusion criteria of our study. Of these 300 study cases, 179 (59.7%) were male patients while 121 (40.3%) were female patients. Mean age of our study cases was 52.10 ± 5.65 years (with minimum age was 42 years while maximum age was 60 years). Mean age of the male patients was 52.07 ± 5.49 years while that of female patients was 52.15 ± 5.89 years (p=0.902). Our study results have indicated that majority of our study cases i.e. 180 (605) belonged to age group of 51 – 60 years of age. Most of our study cases were from poor socioeconomic background i.e. 170 (56.7%) while only 13.3 % belonged to the higher socio-economic status. Majority of our study cases were having low educational level such as illiterate i.e. 60 (20%), primary education in 71 (23.7%) while only 3 % had bachelors degree or above. Mean duration of diabetes was 14.18 ± 2.73 years (with minimum duration of disease was 10 years while 19 years was maximum duration of the disease). Our study results have indicated that majority of our study cases i.e. 171 (57%) had disease duration ranging from 10 to 15 years. Among these patients Grade III diabetic retinopathy was more prevalent i.e. 149 (49.7%) followed by grade IV retinopathy i.e. 100 (33.3%). Diabetes was controlled in only 81 (27%) of our study cases and obesity was present in 101 (33.7%) of our study cases. Microalbuminuria was present in 121 (40.3%) of our study cases and microalbuminuria was stratified with regards to gender, age, socioeconomic status, educational status, disease duration, grades of retinopathy, control of diabetes and obesity and p values were found to be p= 0.004, p=0.054, p=0.000, p=0.000, p=0.000, p=0.000, p= 0.063 and p = 0.025 respectively.

Discussion;

As the number of persons with diabetes increases, the development of microvascular complications like retinopathy, nephropathy and neuropathy also rises. These microvascular complications are linked to the duration of diabetes mellitus, poor glycemic control and systolic hypertension. The magnitude of damage caused by these microvascular complications of diabetes stresses the need for sensitive markers of screening for retinopathy and nephropathy [13-15]

Our study comprised of 300 patients having diabetic retinopathy, out of these 300 study cases, 179 (59.7%) were male patients while 121 (40.3%) were female patients. A study conducted in India by Thakkar et al [16] reported 57 % male patients with diabetes screened for microalbuminuria, these findings are similar to that of our study results. Saleem et al [17] reported male gender predominance over female patients i.e. 54.14 % male

patients, these findings are similar to that of our study results. Rani et al [13] reported 52.2 % male patients which is same as that of our study results.

Different studies have reported that frequency of diabetic retinopathy is more in patients with increasing age. Mean age of our study cases was 52.10 ± 5.65 years (with minimum age was 42 years while maximum age was 60 years). Rani et al [13] reported 58.6 ± 9.6 mean age of diabetic patients with retinopathy, these findings are close to that of our study results. Nisar et al [18] reported 52.18 ± 8.99 years which is similar to that of our study results. Jamil et al [19] 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. Thakkar et al [16] 61.91 ± 9.16 which is quite higher than our study results, the reason for this disparity is that we only included patients ranging from 40-60 years of age.

Mean age of the male patients was 52.07 ± 5.49 years while that of female patients was 52.15 ± 5.89 years. Our study results have indicated that majority of our study cases i.e. 180 (605) belonged to age group of 51 – 60 years of age. Similar results have been reported by Jamil et al[91]. Similar results have by reported by Nisar et al[19].

Most of our study cases were from poor socioeconomic background i.e. 170 (56.7%) while only 13.3 % belonged to the higher socio-economic status. Majority of our study cases were having low educational level such as illiterate i.e. 60 (20%), primary education in 71 (23.7%) while only 3 % had bachelors degree or above.

Mean duration of diabetes was 14.18 ± 2.73 years (with minimum duration of disease was 10 years while 19 years was maximum duration of the disease). Our study results have indicated that majority of our study cases i.e. 171 (57%) had disease duration ranging from 10 to 15 years. Crimi et al [20] reported 14.7 ± 7.1 years mean duration of diabetes in diabetic retinopathy, these results are close to that of our study results. Rani et al [13] 6.6 years mean disease duration among targeted population. These fidnigs are quite lower than that of our study results which can be demonstrated in terms that our inclusion criteria only registered patients with duration of diabetes equal or more than 10 years. Among these patients Grade III diabetic retinopathy was more prevalent i.e. 149 (49.7%) followed by grade IV retinopathy i.e. 100 (33.3%). Diabetes was controlled in only 81 (27%) of our study cases and obesity was present in 101 (33.7%) of our study cases. Similar results have by reported by Rani et al [13] and Thakkar et al [16].

Microalbuminuria was present in 121 (40.3%) of our study cases. Nisar et al [18] from Lahore reported 45.4 % frequency of microalbuminuria in patients with diabetic retinopathy, these findings are close to our study results. Crimi et al [20] reported 23 % micoalbuminuria in diabetic retinopathy. Manaviat et al[8] reported 25.9% frequency of microalbuminuria in patients with diabetic retinopathy. Thakkar et al [16] reported as high as 100 % microalbuminuria in patients with diabetic retinopathy which is very high than our study results.

Conclusion;

Very high frequencies of microalbuminuria were noted in patients with diabetic retinopathy in our study. Microalbuminuria was significantly associated with female gender, increasing age, socio-economic status, low educational level, disease severity, disease duration and obesity. Microalbuminuria was not associated with control of diabetes.

References:

1. American Diabetes Association. "Diagnosis and classification of diabetes mellitus." Diabetes Care. 2014;37(1):S81-S90.
2. Ludwig J, Sanbonmatsu L, Gennetian L, Adam E, Duncan GJ, Katz LF. Neighborhoods, obesity, and diabetes--a randomized social experiment. N Eng J Med.2011 Oct 20;365(16):1509-19.
3. Boussageon R, Bejan-Angoulvant T, Saadatian-Elahi M, Lafont S, Bergeonneau C, Kassaï B. Effect of intensive glucose lowering treatment on all cause mortality, cardiovascular death, and microvascular events in type 2 diabetes: meta-analysis of randomised controlled trials. BMJ. 2011 Jul 26;343:d4169.
4. Crawford TN, Alfaro DV 3rd, Kerrison JB, Jablon EP. Diabetic retinopathy and angiogenesis. Curr Diabetes Rev. 2009 Feb;5(1):8-13.
5. Sattar N, Preiss D, Murray HM, Welsh P, Buckley BM, de Craen AJ. Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies. Lancet. 2010 Jun 26;375(9733):2215-22.
6. 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. Ophthalmology. 2009 Mar;116(3):497-503.

7. Rani PK, Raman R, Gupta A, Pal SS, Kulothungan V, Sharma T. Albuminuria and Diabetic Retinopathy in Type 2 Diabetes Mellitus SankaraNethralaya Diabetic Retinopathy Epidemiology And Molecular Genetic Study (SN-DREAMS, report 12). DiabetolMetabSyndr. 2011 May 25;3(1):9.
8. Manaviat MR, Afkhami M, Shoja MR. Retinopathy and microalbuminuria in type II diabetic patients. BMC Ophthalmol. 2004 Jul 1;4:9.
9. American Diabetes Association. Standards of medical care in diabetes--2012. Diabetes Care. 2012;35(1):11-63.
10. Thomas RL, Dunstan F, Luzio SD, Roy Chowdury S, Hale SL, North RV, et al. Incidence of diabetic retinopathy in people with type 2 diabetes mellitus attending the Diabetic Retinopathy Screening Service for Wales: retrospective analysis. BMJ. 2012;344:e874.
11. Haller H, Ito S, Izzo JL Jr, Januszewicz A, Katayama S, Menne J, et al. Olmesartan for the delay or prevention of microalbuminuria in type 2 diabetes. N Engl J Med. 2011;364:907-17.
12. Ingelfinger JR. Preemptive olmesartan for the delay or prevention of microalbuminuria in diabetes. N Engl J Med. 2011;364:970-1.
13. Rani PK, Raman R, Gupta A, Pal SS, Kulothungan V, Sharma T. Albuminuria and Diabetic Retinopathy in Type 2 Diabetes Mellitus Sankara Nethralaya Diabetic Retinopathy Epidemiology And Molecular Genetic Study (SN-DREAMS, report 12). Diabetol Metab Syndr. 2011 May 25;3(1):9. doi: 10.1186/1758-5996-3-9.
14. Unnikrishnan RI, Rema M, Pradeepa R, Deepa M, Shanthirani CS, Deepa R, Mohan V. Prevalence and risk factors of diabetic nephropathy in an urban South Indian population: the Chennai Urban Rural Epidemiology Study (CURES 45). Diabetes Care 2007;30:2019-24.
15. Chang CH, Chuang LM1. Microalbuminuria and diabetic retinopathy in type 2 diabetic patients: From risk association to risk prediction. J Diabetes Investig. 2013;4(1):42-4
16. Thakkar B, Aroora K, Vekariya R, Lulania M, Agnihotri AS. Prevalence of microalbuminuria in newly diagnosed patients with type II diabetes. NIJRM. 2011;2(4):22-5.
17. Saleem MK, Asgher SA, Hussain SJ. Frequency of diabetic retinopathy and microalbuminuria in newly diagnosed patients and their association with each other. Pak J Med Health Sci. 2010;4(4):479-83.
18. Nisar S, Mateen F, Masud F. Frequency of retinopathy in type II diabetic patients with or without microalbuminuria. Pak J Med Health Sci. 2010;4(4):479-83.
19. 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.
20. Crimi S[1], Cipolli D, Infantone E, Infantone L, Lunetta M. Microalbuminuria and severity of diabetic retinopathy in type 1 diabetic patients: association and relationship with some risk factors. Diabete Metab. 1995 Dec;21(6):440-5.