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TYPE-2 DIABETES MELLITUS;

FREQUENCY OF MICROALBUMINURIA IN PATIENTS HAVING DIABETIC RETINOPATHY IN NISHTER HOSPITAL MULTAN

tahirch77@gmail.com

Dr. Salma Tanweer[1], Dr. Muhammad Tahir[2], Dr. Muhammad Usman[3], Dr. Rashid Kamal[4], Muhammad Ibrahim[5]

1. MBBS, FCPS
Professor of Medicine,
Nishtar Hospital Multan.
2. MBBS, FCPS
Senior Registrar,
Department of Medicine,
Nishtar Hospital Multan.
3. MBBS, FCPS
Senior Registrar,
Department of Medicine,
Nishtar Hospital Multan.
4. MBBS.
Department of Medicine,
Nishtar Hospital Multan.
5. M. Phil
Lecturer, Department of
Biochemistry, Bahauddin Zakariya
Univeristiy, Multan.

Correspondence Address:
Dr. Muhammad Tahir
MBBS, FCPS
Senior Registrar,
Department of Medicine,
Nishtar Hospital Multan.
tahirch77@gmail.com

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ABSTRACT… Objectives: To determine the frequency of microalbuminuria in patients with type 2 diabetes mellitus with retinopathy. **Study Design:** Descriptive study. **Setting:** Out Patient Department Nishtar Hospital Multan. **Period:** June 2015 to December 2015. **Methodology:** Sample size of 296 was calculated according to formula. **Results:** Of these 300 study cases, 179 (59.7%) were male 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). Majority of our study cases had low educational level such as illiterate i.e. 60 (20%), primary education in 71 (23.7%) secondary education 53.3% while only 3 % had bachelor's degree or above. Mean duration of diabetes was 14.18 ± 2.73 years (with minimum duration of disease 10 years and 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%) and grade11 retinopathy (17%). Diabetes was controlled (HbA1c<7%) in only 81 (27%) of our study cases and obesity (BMI>30kg/m2) was present in 101 (33.7%) of our study cases. Microalbuminuria was present in 121(40.3% of our study cases. **Conclusion:** Very high frequency of microalbuminuria was noted in patients with diabetic retinopathy in our study.

Key words: Microalbuminuria, Diabetic Retinopathy, Frequency,

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INTRODUCTION

Diabetes which constitutes different metabolic disorders, is characterized by increased blood glucose levels which results from certain impairments in insulin synthesis and secretion, insulin action, or both of them. Diabetes prevalence and its complications are increasing worldwide affecting Asia more than other region of the world. This rising trend of diabetes is posing equal threats to Pakistan, 10th leading nations of the world for the diabetes by the year 2030.[1,2] The long term complications of hyperglycemia of diabetes are related with chronicty, dysfunctions and impaired functioning of various human organs particularly including heart, nerves, kidneys blood vessels.[3] Diabetes is characterized in different types such as; Type-I, Type II, gestationl and secondary diabetes.[4]

The multisystem complications of diabetes mellitus including neuropathy, nephropathy, retinopathy and coronary heart diseases are regarded as important, thus exerting extra burden on public health policies.[5] Of these multisystem complications of diabetes, diabetic nephropathy and retinopathy are the most common complications of diabetes mellitus which are associated with significant disease morbidity, poor quality of life, long-term hospitalization and mortality particularly when these lead to ESRD and blindness.[6] Early detection followed by proper treatment and management can help prevent ESRD and blindness. The relationship of diabetic retinopathy and microalbuminuria has been well documented in patients having type 1 diabetes.[7,8] However in case of diabetes type II, there is limited data in terms of population-based surveys regarding the concordance of microalbuminuria with that of diabetic retinopathy.[9] In a study done by Manaviat MR et al[10], positive correlation was seen between microalbiminuria and diabetic retinopathy and

25.9% patients of diabetic retinopathy had shown microalbuminuria (resence of albumin to creatinine ratios between 30–300 mg/g was indicative of microalbuminuria).

As these are dreadful complications of diabetes mellitus and contribute to serious morbidity and mortality, the rationale of our study is to determine the frequency of micoalbuminuria in different grades of retinopathy in patients with type 2 diabetic mellitus in our population so that we may take early therapeutic measures to prevent morbidity and mortality in these particular patients.

METHODOLOGY

This descriptive study was carried out in the Out Patient Department Nishtar Hospital Multan from June 2015 to December 2015. Sample size of 296 was calculated according to formula (n= z2 p (1-p)/e^2 p= 25.9 %[8] (frequency of microalbuminuria in type II diabetics with retinopathy) e=margin of error=5% n= (1.96)2 0.26(1-0.26)/ (0.05)2, so 300 patients were included in the study. All the patients with type 2 diabetes mellitus, either taking oral hypoglycemics or on insulin therapy initially on oral drugs were examined with Non-Mydriatic Fundus Camera (NIDEK® Model # AFC-330) and urine sample was collected, sent to pathology department for measurement of microaibumiuria. All patients with diabetic retinopathy, both male and female, with Type 2 diabetes mellitus and age 40-60 years were selected. SPSS version 20 was used to analyze the data. Mean and SD were calculated for age, duration of diabetes. Cross-tabulation of microalbuminuria was done for age, gender, grades of retinopathy, duration of diabetes and chi – square test was applied.

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 (60 %) 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 bachelor's 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

Status	No. of patients	%age
Illiterate	60	20.0
Primary	71	23.7
Elementary	50	16.7
Matriculation	58	19.3
Intermediate	52	17.3
Graduate and \ above	09	3.0

Table-I. Educational status of study population (n=300)

Grade	No. of patients	Percentage
II	51	17.0
III	149	49.7
IV	100	33.3

Table-II. Grades of diabetic retinopathy among study cases. (n=300)

Sex	Microalbuminuria	
	Present (n=121)	Absent (n-179)
Male	60	119
Female	61	60

Table-III. Frequency of microalbuminuria with regards to sex. (n=300)

Age group	Microalbuminuria	
	Present (n=121)	Absent (n-179)
41-50	40	80
51-60	81	99

Table-IV. Frequency of microalbuminuria with regards to age. (n=300)
P-value = 0.054

Level	Microalbuminuria	
	Present (n=121)	Absent (n-179)
Illiterate	31	29
Primary	31	40
Elementary	10	40
Matric	19	39
Intermediate	21	31
Bachelor and		
Above	09	-

Table-V. Frequency of microalbuminuria with regards to level of education. (n=300)
P-value = 0.000

Disease duration	Microalbuminuria	
	Present (n=121)	Absent (n-179)
10-15	42	129
> 15	79	50

Table-IV. Frequency of microalbuminuria with regards to age. (n=300)
P-value = 0.054

Grade	Microalbuminuria	
	Present (n=121)	Absent (n-179)
II	12	39
III	39	110
IV	70	30

Table-VII. Frequency of microalbuminuria with regards to grades of retinopathy. (n=300)
P-value = 0.000

Microalbu-minuria	Disease duration (years)	
	Mean	SD
Yes (n=121)	15.36	2.75
No (179)	13.39	2.42
Total	14.18 + 2.73 years	30

Table-VIII. Frequency of microalbuminuria with regards to mean disease duration. (n=300)
P-value = 0.000

DISCUSSION

Microalbuminuria is usually characterized as a baseline clinical feature of diabetic nephropathy all over the world.[11] Latest updates regarding natural phenomenon of diabetic kidney disease generally originates from reports of the patients having type I diabetes. As the disease progresses microalbuminuria ultimately leads to the development of macroalbuminuria and then progresses to loss of glomerular filtration rate and almost 95 % with diabetic nephropathy will develop diabetic retinopathy.[12]

However such processes are more complicated in case of patients with type 2 diabetes, as these patients are also vulnerable to parenchymal kidney diseases other than classical diabetic glomerulosclerosis, that may include hypertensive disorders, atherosclerosis and lipid toxicity. Despite many research studies have suggested the key role of microalbuminuria in prediction of adverse clinical events which may includ all-cause mortality, cardiovascular end-points and renal failure in non – diabetic patients, very few studies have been done investigating the potential association of microalbuminuria with that of retinopathy in patients having type 2 diabetes mellitus.[13]

Our study comprised of 300 patients having diabetic retinopathy, out of these 300 study cases, 179 (59.7%) were male while 121 (40.3%) were female patients. Out of these, 121 were having microalbuminuria, 61(50.41%) were female and60 (49.59%) were male. A study conducted in India by Thakkar et al[14] reported 57% male patients with diabetes had microalbuminuria, these findings are slightly higher than our study results. Saleem et al[15] reported slight male gender predominance over female patients i.e. 54.14% male patients. Rani et al[11] reported 52.2% male patients which is near to our study results. Various studies have reported frequency of diabetic retinopathy increases 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[9] reported 58.6 ± 9.6 mean age of diabetic patients with retinopathy, these findings are higher than of our

study results. Nisar et al[16] reported 52.18 ± 8.99 years which is similar to that of our study results. Jamil et al[17] reported 50.95 ± 10.12 years mean age for the newly diagnosed diabetic patients having retinopathy, these findings are similar to our study results. Thakkar et al[14] 61.91 ± 9.16 which is quite higher than our study results, the reason for this difference is that we included patients having age in between 40-60 years.

Mean age of the male patients was 52.07 ± 5.49 years while that of female patients was 52.15 ± 5.89 years. Our study results have indicated that majority of our study cases i.e. 180 (60%) belonged to age group of 51 – 60 years of age. Similar results have been reported by Jamil et al[17] and Nisar et al.[16]

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 had low educational level such as illiterate i.e. 60 (20%), primary education in 71 (23.7%), secondary education 170 (56.7%) while only 9(3%) had bachelor degrees 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[18] 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 6.6 years mean disease duration among targeted population.[11] These findings 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.[11,14]

Microalbuminuria was present in 121 (40.3%) of our study cases. Nisar et al[16] from Lahore reported 45.4% frequency of microalbuminuria in patients with diabetic retinopathy, these findings are close to our study results. Crimi et al[18] reported 23 % micoalbuminuria in diabetic retinopathy. Manaviat et al[10] reported 25.9% frequency of microalbuminuria in patients with diabetic retinopathy. Thakkar et al[14] reported as high as 100% microalbuminuria in patients with diabetic retinopathy which is much higher 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, lower socio-economic status, low educational level, disease severity, disease duration and obesity.

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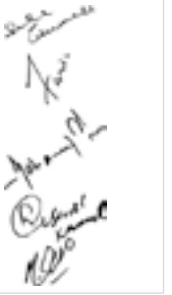
PREVIOUS RELATED STUDY

Mohammad Mohsin Rana, Muhammad Saeed Akhtar, Badar Bashir, Abaid-ur-Rehman. TYPE 2 DIABETICS; THE RELATIONSHIP BETWEEN THE SERUM CHOLESTEROL AND TRIGLYCEROIDS (Original) Prof Med Jour 14(2) 337-343 Apr, May, Jun, 2007.

Usman Khurshid, Ibrahim Us. SIALIC ACID AS A PREDICTOR OF TYPE 2 DIABETES MELLITUS (Original) Prof Med Jour 15(2) 273-280 Apr, May, Jun 2008.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Salma Tanveer	Study Planning, designing, paper writing and editing,	
2	Dr. Muhammad Tahir	Study Planning, designing, manuscript wirting and editing.	
3	Dr. Muhammad Usman	Data collection, manuscript wirting and editing.	
4	Dr. Rashid Kamal	Data collection, data entry and manuscript writing.	
5	Muhammad Ibrahim	Data Analysis, final proofreading and editing.	