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MICROALBUMINEMIA IN TYPE II DIABETIC PATIENTS

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Abstract:

Objective: To determine the frequency of microalbuminemia in type II diabetic patients and to compare lipid profile in type II diabetic patients with and without microalbuminuria

Settings: *Department of Medicine, Civil Hospital, Karachi*

Duration of Study: *From: January 2013 to December 2013.*

Results: *In our study, mean age was 53.18±9.32 years, 43.90 %(n=151) were male and 56.10 %(n=193) were females, frequency of microalbuminuria in type II diabetes mellitus was recorded in 32.56 %(n=112).*

Conclusion: *the frequency of microalbuminuria in type II diabetic patients is higher while the frequency of hypertriglyceridemia's, increased LDL-C and decreased HDL-C in Type II diabetic patients is significantly higher in patients with microalbuminuria when compared them without microalbuminuria.*

Keywords: *Type II diabetes mellitus, microalbuminemia, lipid profile*

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INTRODUCTION:

Diabetes mellitus (DM) is a commonest metabolic disorder categorized by disorders of carbohydrate, fat and protein metabolism due to entire or relative insufficiency of insulin secretion or action 1]. Majority of the diabetic cases are suffering with Diabetic Nephropathy (DN), a serious chronic complication characterized by microalbuminuria [2]. It is also known as a biomarker of cardiovascular disease (CVD) both among diabetic and non-diabetics. The presence of microalbuminuria increases the risk of endothelial dysfunction and diffuse generalized vasculopathy, which may further leads to the development of atherosclerosis [3,4]. A significantly ($p < 0.01$) higher rate (52.6%) of diabetic end stage renal disease (ESRD) was recorded in Asian population as compared those with the Caucasians (36.2%) [5]. Previous human studies are of the view that increased lipid levels are the causative factor in progression and pathogenesis of renal disease, on the other hand, proper and in-time management of dyslipidemia decreases the albumin excretion [5].

The relationship between renal disease and dyslipidaemia has led to an interest for the use of lipid-lowering drugs to prevent renal function from any damage [6]. A local study enrolled Type II diabetics with and without microalbuminuria, they recorded that hypertriglyceridemia was present in 93.7% versus 67.3%, decreased levels of HDL-C were recorded in 91.3% vs. 81.4% while the raised LDL-C levels were 93.2% vs. 69.5%. [7]. The diabetic subjects had microalbuminuria in 34% of the cases [7]. Previous studies are showing some contradiction, they recorded a significant association of microalbuminuria with lower HDL-C i.e ($p<0.05$)[8] but total cholesterol, triglycerides and LDL-C were insignificant. Contrary to this, some authors revealed significant differences in Triglycerides ($p<0.001$)[9] between those with positive microalbuminuic and normal subjects, while no significant difference was recorded in LDL-C, HDL-C and total cholesterol. Keeping in view that the cases with positive microalbuminuria, diabetics are more prone in development of cardiac problems but usually diabetic patients remain undiagnosed in this regard, however, we wanted to clarify the variation between studies so that they can be managed accordingly and can be prevented from cardiac morbidities and mortality.

MATERIAL AND METHODS:

In this study, 300 diagnosed type-II diabetic cases between 35-70 years of age of either gender were included while those with macroalbuminuria (Urinary albumin excretion > 300mg/d), increased serum creatinine (1.3 mg/dl for females and 1.5 mg/dl for male), having history of cardiovascular disease (History of typical cardiac chest pain, evidence of ischemic heart disease changes on ECG), urinary tract infection and pregnant women were not included. Purpose for conducting the study was clarified to all of the patients and informed consent was obtained. All basic demographic data of each participant was recorded. Blood sample of the patients was obtained after passing 12 hours of fasting hypertriglyceridemia's, raised LDL-C lower HDL-C and spot mid-stream early morning urine sample was collected in laboratory and reports were assessed by pathologist. Hypertriglyceridemia, raised LDL-C and decreased HDL-C were noted by researcher himself. The collected data was analyzed statistically. Mean ± S.D was calculated for triglyceride levels, LDL, HDL and total cholesterol. The frequency for gender of the patients and presence/absence of Hypertriglyceridemia, increased LDL-C and decreased HDL-C was recorded.

RESULTS:

In our study, we calculated 53.18 ± 9.32 years as mean age of the participants. Distribution of patients according to gender reveals 43.90%(n=151) male and 56.10%(n=193) were females. Frequency of microalbuminuria in type II diabetes mellitus was recorded in 32.56 %(n=112) while 67.44%(n=232) had no findings of the morbidity. (Table No. 3) Lipid profile of the cases was calculated and recorded it shows that 87.5%(n=98) out of 112 cases of microalbuminuria, and 61.64%(n=143) out of 232 cases of without albuminuria had hypertriglyceridemia, 91.07%(n=102) cases in microalbuminuria and 61.64%(n=13) without albuminuria had increased LDL-C while 84.82%(n=95) in microalbuminuria and 72.84%(n=169) without albuminuria had decreased HDL-C, all findings were significantly higher in cases with albuminuria. (Table No. 4) Triglycerides in patients with microalbuminuria were recorded as 174.25 ± 10.58 while 171.20 ± 11.98 in patients without microalbuminuria, LDL-C was recorded as 127.36 ± 9.32 in microalbuminuria and 125.68 ± 8.98 in cases without microalbuminuria, HDL-C 34.98 ± 4.46 in microalbuminuria and 36.57 ± 4.15 in cases without microalbuminuria. (Table No. 5)

TABLE No. 1
AGE DISTRIBUTION (n=300)

Age(in years)	No. of patients	%
35-50	124	41.33
51-70	176	58.67
Total	**300**	**100**
mean±sd	**53.18±9.32**	

TABLE No. 2
GENDER DISTRIBUTION (n=300)

Gender	No. of patients	%
Male	136	45.33
Female	164	54.67
Total	**300**	**100**

TABLE No. 3
FREQUENCY OF MICRALBUMINURIA IN TYPE II DIABETES MELLITUS (n=300)

Microalbuminuria	No. of patients	%
Yes	87	29
No	213	71
Total	**300**	**100**

TABLE No. 4
LIPID PROFFILE IN TYPE II DIABETIC PATIENTS WITH AND WITHOUT MICROALBUMINURI (n=300)

Lipid profile	Microalbuminuria (n=87)		Without Microalbuminuria (n=213)	
	No. of patients	%	No. of patients	%
Hypertriglyceridemias	97	82.10	141	60.41
Increased LDL-C	101	91.14	149	63.18
Decreased HDL-C	94	84.80	168	72.24

TABLE No. 5
MEAN LIPID PROFILE IN TYPE II DIABETIC PATIENTS WITH AND WITHOUT MICROALBUMINURIA (n=300)

Lipid profile	Microalbuminuria		Without Microalbuminuria	
	Mean	SD	Mean	SD
Triglycerides	173.22	10.51	170.87	11.54
LDL-C	126.94	8.99	124.28	8.69
HDL-C	34.570	4.36	35.85	4.18

DISCUSSION:

We planned this study with the view to find the frequency of hypertriglyceridemia, increased LDL-C and decreased HDL-C with and without microalbuminuira in type-II diabetic patients. As with microalbuminuria, diabetic patients are at more risk of developing cardiac problems but often diabetic patients remain undiagnosed of presence of microalbuminuria. We compared our results with a local study, where in Type II diabetic patients with and without microalbuminuria, hypertriglyceridemia was 93.7% vs. 67.3%, decreased HDL-C was 91.3% vs. 81.4% and raised LDL-C was 93.2% vs. 69.5%.[7] In the Diabetic patients 34% had microalbuminuria [7], our findings are comparable with this study. Buch Archana C and others [10] studied renal and lipid profile in diabetic patients, they recorded prevalence of microalbuminuria in 41% and equal in both sexes, these findings are consistent with our study. They also recorded that fasting blood sugar, blood urea and serum creatinine was significantly higher in the microalbuminuric group. Lipid profile parameters were not significantly different in both the groups, we found similar findings in our study.

Diouf NN and others [11] established the respective prevalence of microalbuminuria and dyslipidemia and evaluated their association with diabetes type 2, they recorded that the prevalence of microalbuminuria is 48.7% and that of dyslipidemia is 41.1%. Glycated hemoglobin is higher in subjects with microalbuminuria than in patients with normal microalbuminuria with a statistically significant difference ($P < 0.001$). There is a strong correlation ($R = 0.82$) between glycated hemoglobin and microalbuminuria, 1% increase in HbA1c corresponding approximately to an increase of 39.7 mg/I of microalbuminuria, they concluded that

microalbuminuria and dyslipidemia are frequently found in type 2 diabetes, but the pathophysiological mechanisms of the association are not well known. Increased total cholesterol and/or TG have been associated with microalbuminuria [12]. Although associations with lipid abnormalities were found to be more marked in patients with macroalbuminuria [12]. With respect to the pediatric populations with diabetes, data from the Oxford Regional Prospective Study showed that the prevalence of microalbuminuria increased across tertiles of total cholesterol [13] and a German study has shown a predictive value of both LDL cholesterol and TG on the development of persistent microalbuminuria [14]. However, our study confirmed the frequency of hypertriglyceridemias, increased LDL-C decreased HDL-C in diabetic patients with microalbuminuria is significantly higher than in patients without microalbuminuria, we can manage these cases accordingly and prevent them from cardiac morbidities and mortality.

CONCLUSION:

We concluded that the frequency of microalbuminemia in type II diabetic patients is higher while the frequency of hypertriglyceridemias, increased LDL-C and decreased HDL-C in Type II diabetic patients is significantly higher in patients with microalbuminuria when compared them without microalbuminuria.

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