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Research Article

FREQUENCY OF DYSLIPIDEMIA IN DIABETIC AND NON DIABETIC POPULATION

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Abstract:

OBJECTIVE: To determine the frequency of dyslipidemia in diabetic and non diabetic population

PATIENTS AND METHODS: This comparative cross sectional study of six months was conducted at tertiary care teaching hospital Hyderabad. The inclusion criteria of the study were diagnosed type-2 diabetic population, of ≥ 35 years of age, either gender and non diabetic healthy individual, of ≥ 35 years of age, either gender, not taking any lipid lowering therapy. The clinical history was taken and relevant investigations were performed by advising 12 hours over night fasting and the blood sample was taken on the next morning for the lipid profile. The data was collected on pre-designed proforma and analyzed in SPSS 16

RESULTS: During six months study period, total fifty diabetic and fifty non diabetic individuals were evaluated for dyslipidemia. Out of 50 diabetic patients 35 males and 15 females and of 50 non diabetic individuals 30 males and 20 females respectively. The dyslipidemia was observed in 43 type 2 diabetic patients, of which 27 were males and 16 were females. The dyslipidemia was observed in 21 healthy individuals of which 13 were males and 08 were females. The mean age \pm SD for whole diabetic and non diabetic population was 52.97 ± 8.95 and 49.97 ± 7.53 while the mean \pm SD for serum cholesterol, LDL, triglycerides and HDL in diabetic and non diabetic population was 230.76 ± 5.83 , 150.83 ± 5.53 , 320.82 ± 7.95 , 28.82 ± 4.52 and 160.98 ± 8.54 , 98.99 ± 7.43 , 189.75 ± 8.82 and 37.86 ± 5.96 . The dyslipidemia was observed in 43 (86%) diabetic patients and 22 (44%) non diabetic individuals.

CONCLUSION: Diabetic population is prone to be dyslipidemic as compared to non diabetics and predisposes them to premature atherosclerosis and macrovascular complications

KEYWORDS: Type 2 diabetes mellitus, Dyslipidemia, Lipid profile.

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INTRODUCTION:

Type-2 diabetes associated with insulin resistance occurs as a metabolic syndrome (also known as syndrome-X) in obese patients. Hypertension, dyslipidaemia and procoagulant state off addition to hyperglycaemia are it's main features.[1-4] All cardiovascular risk factors except smoking are more prevalent in diabetics. Cigarette smoking appears to act synergistically with hypercholesterolaemia possibly by increasing the oxidation of LDL-cholesterol and elicits insulin resistance syndrome in diabetics who are chronic smokers. [5] Combination of raised triglycerides and low HDL-C constitutes the commonest pattern of dyslipidaemia in type-2 diabetics. It's features are high triglycerides, low HDL-C and qualitative change in LDL patients producing smaller but dense LDL-C particles, whose membranes carry supranormal amount of free cholesterol. A low HDL-C is a major risk factor predisposing to macrovascular disease. [6,7] Increased oxidized LDL-C found in diabetics provides a rationale for antioxidant therapy. High plasma levels of vitamin-E reduce risk of coronary heart disease. Dietary antioxidants are strongly recommended in diabetics. [8] Current American Diabetes Association guidelines accord reducing LDL-C, the first treatment priority, followed by increasing HDL-C and lowering triglyceriders8. Statins are the first line agents for lowering LDL-C and after 4-6 weeks of treatment, statins reduce LDL and cholesterol. [9] Normalization of lipoprotein profile in diabetics has been demonstrated with good glycaemic control.[10] Therefore, this study was conducted to observe the dyslipidemia in diabetic and non diabetic population presented at tertiary care hospital Hyderabad.

PATIENTS AND METHODS:

This comparative cross sectional study of six months was conducted at tertiary care teaching hospital Hyderabad. The inclusion criteria of the study were

diagnosed type-2 diabetic population, of ≥ 35 years of age, either gender and non diabetic healthy individual, of ≥ 35 years of age, either gender, not taking any lipid lowering therapy while the exclusion criteria were type-I Diabetic individuals, patients with history of acute myocardial infarction (up to six weeks), nephrotic syndrome, chronic liver disease, taking beta-blockers or thiazide diuretics or any lipid lowering regimen. Total one hundred subjects were recruited, fifty patients of type 2 diabetes mellitus and fifty healthy individuals. The informed consent was taken and both the groups were evaluated for their lipid profile to see the existence of dyslipidemia. The clinical history was taken and relevant investigations were performed by advising 12 hours over night fasting and the blood sample was taken on the next morning for the lipid profile. The data was collected on pre-designed proforma and analyzed in SPSS 16. The frequency and percentage was calculated while the mean \pm SD was computed for numerical variables.

RESULTS:

During six months study period, total fifty diabetic and fifty non diabetic individuals were evaluated for dyslipidemia. Out of 50 diabetic patients 35 males and 15 females and of 50 non diabetic individuals 30 males and 20 females respectively. The dyslipidemia was observed in 43 type 2 diabetic patients, of which 27 were males and 16 were females. The dyslipidemia was observed in 21 healthy individuals of which 13 were males and 08 were females. The mean age \pm SD for whole diabetic and non diabetic population was 52.97 ± 8.95 and 49.97 ± 7.53 while the mean \pm SD for serum cholesterol, LDL, triglycerides and HDL in diabetic and non diabetic population was 230.76 ± 5.83 , 150.83 ± 5.53 , 320.82 ± 7.95 , 28.82 ± 4.52 and 160.98 ± 8.54 , 98.99 ± 7.43 , 189.75 ± 8.82 and 37.86 ± 5.96 . The results of the study are presented in Table 01 and 02.

TABLE 01: THE AGE DISTRIBUTION OF DIABETIC AND NON DIABETIC POPULATION

AGE (years)	DIABETIC (N=50)	NON – DIABETIC (N=50)
35-39	08 (16%)	10 (20%)
40-49	14 (28%)	15 (30%)
50-59	18 (36%)	18 (36%)
50+	10 (20%)	07 (14%)

TABLE 02: THE FREQUENCY OF DYSLIPIDEMIA IN DIABETIC AND NON DIABETIC POPULATION

DYSLIPIDEMIA	TYPE-2 DIABETICS	NON-DIABETICS
SERUM TRIGLYCERIDES		
200-400 mg/dl	12 (27.9%)	06 (27.2%)
>400 mg/dl	05 (11.6%)	03 (13.6%)
SERUM CHOLESTEROL		
200-240mg/dl	08 (18.6%)	03 (13.6%)
>240mg/dl	02 (4.6%)	02 (9%)
SERUM LDL CHOLESTEROL		
100-159mg/dl	08 (18.6%)	02 (9%)
>160mg/dl	01 (2.3%)	01 (4.5%)
SERUM HDL CHOLESTEROL		
<35mg/dl	05 (11.6%)	03 (13.6%)
MIXED DYSLIPIDEMIA	02 (4.6%)	01 (4.5%)
TOTAL	43	22

DISCUSSION:

In present study, fasting lipid profile of one hundred individuals (fifty diabetic and fifty non diabetic) was assessed. The study conducted on dyslipidemia Associated with Poor Glycemic control in type 2 Diabetes Mellitus shown that serum triglyceride was raised in 75% patients with controlled diabetes mellitus while in uncontrolled diabetes serum cholesterol was raised in 77% and serum triglycerides in 85% patients. [11] The findings of present study are also consistent. In present study, males had higher levels of LDL-C in comparison to females the finding is consistent with that of Ahmad MM, et al. [12] In current series, 11.6% diabetics had HDL-C <35mg/dl. Low HDL-C was a common associated finding with raised serum TG, serum cholesterol and LDL-C Framingham. [13] A former study conducted on diabetic population shown that serum cholesterol and LDL cholesterol were raised in 22% patients. [14] In our study serum cholesterol was raised in 23% type-2 diabetics and LDL-C (>160mg/dl) was found in 20.9% diabetic patients. This finding was consistent with the former study. [14] The reason for difference is dietary habits between two populations. Hypertriglyceridaemia is the commonest lipid abnormality in type-2 diabetics, particularly those

with uncontrolled diabetes and is a risk factor for macrovascular disorders due to reduced synthesis of hepatic insulin dependent lipoprotein lipase resulting in impaired clearance of IDL, chylomicrons and VLDL remnants. [16] Raised triglycerides are associated with decreased fibrinolysis and hypercoagulability contributing to coronary heart diseases. [17] In present study, serum TG was raised in 39.5% (the commonest dyslipidaemia seen among type-2 diabetics) and the findings is consistent with the study by Haider Z, et al. [14] Khan F, et al [18] observed hyperglyceridaemia the most prevalent lipid abnormality in diabetic population. In our study, raised serum TG was the commonest dyslipidaemia seen among type-2 diabetics. The study by Gulzar A, et al [19] shown 48% patients had hypercholesterolaemia, whereas another study shows hypercholesterolaemia in 30% patients. The reason for difference might be due to change in dietary habits of peoples. Generally it is known that good glycaemic control leads to normalization of dyslipidaemia, whereas uncontrolled diabetes is usually associated with marked derangements in lipid profile. [20] Another important component of the study was evaluation of lipid profile in non diabetic individuals because dyslipidaemia in non-

diabetics might be due to existence of underlying genetic disorder, not known previously and in present study 22 (44%) patients healthy individuals found to be dyslipidemic.

Therefore diabetic dyslipidaemia is long term complication of diabetes mellitus and predisposes to atherosclerotic complications occurring in the form of microangiopathy or macroangiopathy. Thus, early detection and management can reduce the mortality and morbidity.

CONCLUSION:

Diabetic population is prone to be dyslipidemic as compared to non diabetics and predisposes them to premature atherosclerosis and macrovascular complications while the non diabetics population should also be screened for existence of dyslipidemia. The good glycaemic control can prevent development and progression of lipid abnormalities among type 2 diabetes mellitus.

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