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To Compare the Pattern of Serum Non HDL, HDL Levels in Type 2 Diabetes Subjects With and Without Ischemic Heart Disease

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Abstract **Original Research Article**

Individuals with DM may have several forms of dyslipidemia. Because of the additive cardiovascular risk of hyperglycemia and hyperlipidemia, lipid abnormalities should be assessed aggressively and treated as part of comprehensive diabetes care. The most common pattern of dyslipidemia is hypertriglyceridemia and reduced HDL cholesterol levels. DM itself does not increase levels of LDL, but the small dense LDL particles found in type 2 DM are more atherogenic because they are more easily glycated and susceptible to oxidation. Low HDL cholesterol as an independent risk factor for CHD Strong epidemiological evidence links low levels of serum HDL cholesterol to increased CHD morbidity and mortality. High HDL-cholesterol levels conversely convey reduced risk. Epidemiological data taken as a whole signify that a 1 percent decrease in HDL cholesterol is associated with a 2–3 percent increase in CHD risk. Epidemiological studies consistently show low HDL cholesterol to be an independent risk factor for CHD. ***Objective*:** To compare the pattern of serum non HDL, HDL levels in type 2 diabetes subjects with and without Ischemic Heart Disease. A descriptive study was carried out. ***Source of Data*:** Primary observed data of subjects with type 2 diabetes admitted to Medicine wards for ischemic heart disease. Control group of Type 2DM without IHD. ***Statistical Tests*:** Chi square test, students T test Bar and Pie chart. Related statistical techniques using SPSS version 21.0. ***Results*:** Among the 100 subjects chosen for the study, 59 subjects were males (59%) and remaining 41 subjects were females (41%). Majority of the subjects were in the age group of 50-69 years (60%). Mean non HDL value among non IHD was 67.1±14.6 and among IHD cases were at higher level i.e 176.4±18.7. p value showed statistical significance. ***Conclusion*:** UACR is statistically different among subjects with IHD compared to subjects without IHD. Hence subjects with Type 2 DM with IHD have been found to have higher total cholesterol, higher Non HDL levels, higher UACR levels with lower HDL levels compared to subjects without IHD.

Keywords: HDL, Non HDL, type 2 DM, ischemic heart disease.

INTRODUCTION

Ischemic heart disease (IHD) is among the most frequent causes of morbidity and mortality worldwide [1, 2]. In the presence of this alarming epidemic, the case for identifying and targeting patients with IHD for aggressive treatment to reduce cardiovascular risk is well established. Risk factors for the development of IHD include age, alcohol, smoking, diabetes, hypertension, sedentary life style, obesity and dyslipidemia [3-5]. Unlike in the West, where older people are most affected, diabetes in Asian countries is disproportionately high in young to middle-aged adults. Non HDL cholesterol is defined as the difference between total and HDL cholesterol and thus represents cholesterol carried on all of the potentially atherogenic Apo-B containing particles (primarily VLDL, IDL and LDL as well as chylomicron remnants and lipoprotein a) [6].

Objective: To compare the pattern of serum non HDL, HDL levels in type 2 diabetes subjects with and without Ischemic Heart Disease.

MATERIAL AND METHODS

A descriptive study was carried out.

Source of data: Primary observed data of subjects with type 2 diabetes admitted to Medicine wards for ischemic heart disease. Control group of Type 2DM without IHD.

Methods of estimation: Total Cholesterol- Cholesterol is measured enzymatically in serum or plasma in a series of coupled reactions that hydrolyze cholesteryl esters and oxidize the 3-OH group of cholesterol. One of the reaction byproducts, H2O2 is measured quantitatively in a peroxidase catalyzed reaction that produces a colour. Absorbance is measured at 500 nm. The colour intensity is proportional to cholesterol concentration.

Statistical tests: Chi square test, students T test Bar and Pie chart. Related statistical techniques using SPSS version 21.0.

RESULTS

Among the 100 subjects chosen for the study, 59 subjects were males (59%) and remaining 41 subjects were females (41%). Majority of the subjects were in the age group of 50-69 years (60%).

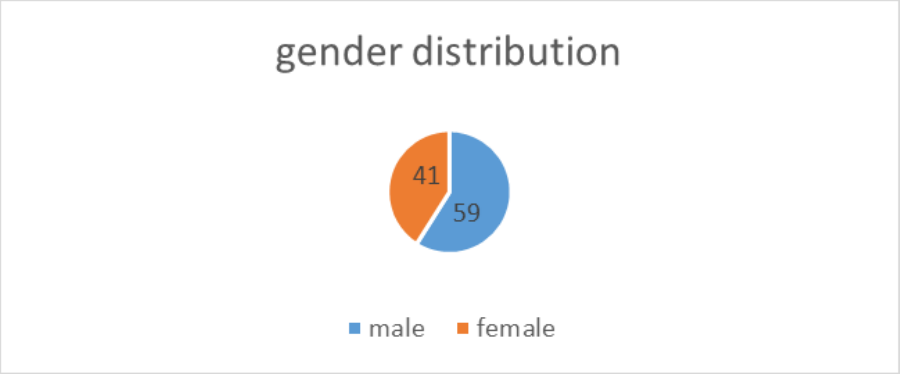

Figure 1: Gender distribution

Table 1: Distribution of Non HDL levels

Non HDL		Mean	SD	P value
IHD	Without	67.1	14.6	<0.0001
	With	176.4	18.7	

Mean non HDL value among non IHD was 67.1+14.6 and among IHD cases were at higher level i.e 176.4+18.7. p value showed statistical significance.

Table 2: Distribution of HDL levels

HDL		Mean	SD	P value
IHD	Without	44.7	5.5	<0.0001
	With	36.7	5.3	

Mean HDL value among non IHD was 44.7+5.5 and among IHD cases were at lower level i.e 36.7+5.3. p value showed statistical significance.

Table 3: Distribution of UACR levels

UACR		Mean	SD	P value
IHD	Without	25.9	5.3	<0.0001
	With	68.7	38.7	

Mean UACR value among non IHD was 25.9+5.3 and among IHD cases were at higher level i.e 68.7+38.7. p value showed statistical significance.

DISCUSSION

In present study, among the 100 subjects chosen for the study, 59 subjects were males (59%) and remaining 41 subjects were females (41%). Majority of the subjects were in the age group of 50-69 years (60%). Mean non HDL value among non IHD was 67.1+14.6 and among IHD cases were at higher level i.e 176.4+18.7. p value showed statistical significance.

Mean HDL value among non IHD was 44.7+5.5 and among IHD cases were at lower level i.e 36.7+5.3. p value showed statistical significance. Mean UACR value among non IHD was 25.9+5.3 and among IHD cases were at higher level i.e 68.7+38.7. p value showed statistical significance.

Association between diabetes and heart disease was described more than a century ago which initially was presumed to be caused by atherosclerosis. Diabetes

as a cardiovascular risk equivalent was confirmed by Framingham study and other landmark studies [7]. Characteristics of diabetic dyslipidemia include elevated triglyceride, elevated low density lipoprotein cholesterol (LDL-C) and low high density lipoprotein cholesterol (HDL-C) levels [8].

However, recently it has been also recommended to target non-HDL cholesterol for reducing cardiovascular morbidity and mortality. Before the recognition of low HDL-C as a risk factor, in 1963 Albrink already demonstrated that triglyceride was equally important with cholesterol in determining atherosclerotic risk in diabetes [9]. However, HDL-C is a strong inverse covariate of triglyceride. In the Fenofibrate Intervention and Event Lowering in Diabetes (FIELD) study, triglyceride was reduced almost to 30%, but the primary endpoint of major coronary events was not reduced significantly [10].

CONCLUSION

There was significant difference in the mean UACR among patients with and without IHD. Statistically significance was seen with p-value of <0.001 at 5% significance level. UACR is statistically different among subjects with IHD compared to subjects without IHD. Hence subjects with Type 2 DM with IHD have been found to have higher total cholesterol, higher Non HDL levels, higher UACR levels with lower HDL levels compared to subjects without IHD.

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