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COMPARISON OF LIPID PROFILE IN DIABETIC AND NON-DIABETIC PATIENTS WITH ISCHEMIC HEART DISEASE

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Abstract:
Introduction: *Cardio Vascular Disease (CVD) is a leading cause of death in the world. In Sri Lanka 40 % of proportional mortality is due to CVD. South Asians are susceptible to Acute Myocardial Infarction (AMI) at an earlier age as they tend to develop higher risk-factor levels much earlier in life.* ***Aims and objectives:*** *The basic aim of the study was to analyze the lipid profile in diabetic and non-diabetic patients with ischemic heart disease. This study was done in the local population of Pakistan.* ***Material and methods:*** *This cross-sectional study was conducted in Jinnah Hospital, Lahore during March 2019 to November 2019. The data was collected from 100 patients of both genders. The data were collected through randomly selected sampling technique. There were two groups of study one was suffering from diabetes and one was non diabetic patients. Diagnosed cases of diabetic and non-diabetic atherosclerotic patients were included after obtaining a written consent from their care takers to take part in the study. Questionnaires were duly filled in with bio-data of the patients, clinical presentation of the illness, complete blood count record, along with available additional investigative information.* ***Results:*** *The data were collected from 100 patients. The study subjects were divided: on the basis of health condition into normal, N group; non-diabetic and atherosclerotic, NA group; and diabetic and atherosclerotic, DA group. Irrespective of statin therapy the Lp(a) concentration was not significantly different among males or females and was higher than 45 mg/dL. The average TC and LDLc were within the normal range irrespective of Lp(a) being above 30 mg/dL (upper limit reagent kit) or more than 25 mg/dL as suggested cutoff.* ***Conclusion:*** *It is concluded that comparison of lipid profile in non-diabetic and diabetic atherosclerosis patients would enable us to maintain the health of patients by reducing cardiovascular risk.*

Key words: *Lipid, Human, Patients, CVD*

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INTRODUCTION:

Cardio Vascular Disease (CVD) is a leading cause of death in the world. In Sri Lanka 40 % of proportional mortality is due to CVD. South Asians are susceptible to Acute Myocardial Infarction (AMI) at an earlier age as they tend to develop higher risk-factor levels much earlier in life. Sudden cardiac death (SCD) is estimated to account for 50 % of deaths from cardiovascular causes and about half of these deaths occur in subjects who were previously undiagnosed with heart disease. Coronary artery disease is the underlying cause in 80 % of SCDs, consequently, risk factors for coronary artery disease also predispose to SCD1. Risk factors for CVD comprise dyslipidemia, diabetes, hypertension, obesity, sedentary lifestyle, smoking, alcohol, family history, menopause and advancing age. Further, homocysteine, fibrinogen, lipoprotein(a), low density lipoprotein particle size and c-reactive protein are the conditional risk factors that contribute to CVD[2].

Management of lipid levels as part of risk factor modification associated with CAD is usually based on lipid profiles. Several studies indicate elevated Lp(a) is independently and linearly predictive of future adverse coronary events. Lp(a) excess increase the risk of premature CAD 3–100 fold depending on the absence or presence of concomitant risk factor[3]. The inter-individual variability in the concentration of Lp (a) is mainly due to genetic regulation of rate of apoprotein (a) production[4]. Lp(a) promote pro-atherogenic processes by many mechanisms ie; interacting with fibrin and tissue matrix components in vessel walls, inhibiting activation of plasminogen to plasmin, inhibiting plasmin mediated activation of transforming growth factor β (TGF-β) leading to increased proliferation of smooth muscle cells and promoting inflammatory process by inducing monocyte chemotactic activity of vascular endothelial cells[5]. Thus Lp(a) would be a better risk marker for management of those with CAD and also for prediction of CAD susceptibility[6].

Aims and objectives

The basic aim of the study was to analyze the lipid profile in diabetic and non-diabetic patients with ischemic heart disease. This study was done in the local population of Pakistan.

MATERIAL AND METHODS:

This cross-sectional study was conducted in Jinnah Hospital, Lahore during March 2019 to November 2019. The data was collected from 100 patients of both genders. The data were collected through randomly selected sampling technique. There were two groups of study one was suffering from diabetes and one was non diabetic patients. Diagnosed cases of diabetic and non-diabetic atherosclerotic patients were included after obtaining a written consent from their care takers to take part in the study. Questionnaires were duly filled in with bio-data of the patients, clinical presentation of the illness, complete blood count record, along with available additional investigative information. Inclusion criteria were male and female, aged 45–75 years, with the history of diabetes and atherosclerosis. Exclusion criteria were subjects with the history of smoking, alcoholism, renal diseases, thyroid disorders, pregnancy or any disease.

Statistical Analysis

Statistical analysis (Anova Test and Post Hoc) was performed using the SPSS software program (17.0). All results were expressed as the mean ± standard deviation (SD). As P value <0.05 was considered to be statistically significant.

RESULTS:

The data were collected from 100 patients. The study subjects were divided: on the basis of health condition into normal, N group; non-diabetic and atherosclerotic, NA group; and diabetic and atherosclerotic, DA group.

Table 1: **General demographic characteristics of the study population.**

Subjects	Characteristics	Gender	**Age groups**		
			45–55 yrs	56–65 yrs	66–75 yrs
N group	Age	M	50.06 ± 0.56	60.28 ± 0.51	70.21 ± 0.52
		F	49.93 ± 0.51	53.87 ± 1.04	70.34 ± 0.54
NA group		M	50.15 ± 0.54	60.06 ± 0.52	70.21 ± 0.52
		F	53.87 ± 1.04	60.09 ± 0.49	72.21 ± 0.52
DA group		M	50.15 ± 0.53	60.06 ± 0.52	70.21 ± 0.52
		F	50.00 ± 0.55	60.09 ± 0.50	71.21 ± 0.52
N group	FBG, mmol/L	M	4.2 ± 2.9	4.3 ± 0.07	4.4 ± 0.08
		F	3.8 ± 0.06	4.5 ± 0.07	5.1 ± 0.08
NA group		M	3.9 ± 0.03	4.0 ± 0.04	5.3 ± 0.18
		F	4.2 ± 0.01	4.5 ± 0.03	5.4 ± 0.16
DA group		M	7.1 ± 0.03	8.1 ± 0.02	8.8 ± 4.8
		F	7.3 ± 0.02	7.9 ± 0.03	8.9 ± 5.2
N group	HbA1c, %	M	3.9 ± 0.56	4.0 ± 0.15	4.1 ± 0.54
		F	3.6 ± 0.51	3.7 ± 0.15	4.0 ± 0.15
NA group		M	5.6 ± 0.43	6.1 ± 0.15	6.4 ± 0.15
		F	5.7 ± 0.42	6.6 ± 0.15	6.6 ± 0.52
DA group		M	7.9 ± 0.4	8.7 ± 0.15	9.9 ± 0.51
		F	7.8 ± 0.01	8.8 ± 0.02	10.1 ± 0.55

Irrespective of statin therapy the Lp(a) concentration was not significantly different among males or females and was higher than 45 mg/dL. Variation of lipid profile values with high and low Lp(a) concentrations is stated in Table 2. The average TC and LDLc were within the normal range irrespective of Lp(a) being above 30 mg/dL (upper limit reagent kit) or more than 25 mg/dL as suggested cutoff.

Table 2: **Lipid profile results in patients with high**

Lipid test	**Lp(a) >30 mg/dL**	**Lp(a) <30 mg/dL**	**Lp(a) >25 mg/dL**	**Lp(a) <25 mg/dL**
TC (< 200 mg/dL)	154.6 ± 32.2	143.3 ± 39.6	153.7 ± 34.3	142.0 ± 39.2
LDLc (< 100 mg/dL)	95.4 ± 28.9	84.4 ± 33.5	94.3 ± 30.1	83.8 ± 32.6
HDLc (> 40 mg/dL)	34.3 ± 7.4	33.0 ± 11.9	34.7 ± 9.8	31.7 ± 8.0
TG (<150)	128.7 ± 47.0	138.5 ± 77.0	131.2 ± 48.4	135.9 ± 82.6
TC:HDLc (< 5)	4.6 ± 1.2	4.6 ± 1.4	4.6 ± 1.2	4.6 ± 1.3

DISCUSSION:

Diabetic individuals are at an increased risk of CVD compared to nondiabetic individuals, therefore diabetic subject have high mortality rate. Diabetic dyslipidemia is one of the major risk factors which contributes to atherosclerosis, one of the main forms of CVD[7]. The study analyzes the pattern of modifiable risk factor i.e., diabetes and non-modifiable risk factors like age and gender in atherosclerotic patients. Our results showed that the FBG and HbA1c levels were higher particularly in DA subjects as compared to NA. This conforms the study of Ghazanfari, *et al*. who presented that FBG and HbA1c are used as diagnostic bio-marker to separate diabetic from non-diabetic subjects[8]. The study showed that age and gender have no effect on fasting glucose level and HbA1c. However it was found that the HbA1c value increases in DA as well as in NA male and female groups.

Diabetic dyslipidemia is also known as atherogenic dyslipidemia due to presence of high level of cholesterol, triglycerides and low level of HDL. To further explore this possibility, we evaluated the relationship of diabetes (another condition associated with development of atherosclerosis), with lipid profile parameters across three age groups (45–55, 56–65 and 66–75 year of age) in all groups (N, NA, DA) male and female subjects[9]. Our results showed significant increase in TC, TG, LDL, and VLDL levels in both genders in DA as compared to NA and N groups. Whereas DA group males and females have significant lower level of HDL in comparison to NA group and N group[10]. In DA group, females have significantly higher level of TC, TG, LDL, and VLDL and significantly lower level of HDL as compared to males. This data is in agreement with other studies which show abnormal lipid pattern in diabetic and normal subjects although the cut off values slightly differed[11].

CONCLUSION:

It is concluded that comparison of lipid profile in non-diabetic and diabetic atherosclerosis patients would enable us to maintain the health of patients by reducing cardiovascular risk. By correlating the effect of age and gender on lipid profile in these

patients, it is concluded that in old age, diabetic females are more prone to dyslipidemia than diabetic males of the same age.

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