



## Assessment of Lipid Profile in Non-Diabetic and Diabetic patients with Ischemic Heart Disease.

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### Abstract:

**Objective:** The main aim of this study was to assess the lipid profile in non-diabetic and diabetic patients who were suffering from ischemic heart disease.

**Place and Duration of Study:** This study was completed in a duration of 6 months from June 2019 to November 2019 in medical units of General hospital Lahore.

**Material and Methods:** This cross sectional study consisted of 100 patients which were included in this study after informed consent. Patients of both genders were selected randomly and randomized sampling technique was used to collect the data. Diabetics and non-diabetics were classified into two groups. Among the non-diabetics and diabetics, patients who were having atherosclerotic disease were included in this study. Data was collected using carefully designed proforma and information regarding age, gender, clinical signs and symptoms and other relatable information was obtained. Necessary investigations like CBC and lipid profile were carried out. Hospital ethical committee approval was taken.

**Results:** A total of 100 patients were included in this study and then they were classified into three groups depending upon the health. 1<sup>st</sup> group was normal who had no disease, 2<sup>nd</sup> group had patients who had atherosclerosis and diabetes (DA) and 3<sup>rd</sup> group included patients who were non-diabetics and had atherosclerosis (NA). Despite the fact that patients were using statins to low cholesterol levels, their apolipoprotein Lp(a) levels were greater than 45mg/dl and a little difference was present in males and females. Average low density lipoproteins and total cholesterol levels were within normal value despite the fact that apolipoproteins were higher than 30mg/dl or 25mg/dl (recommended values).

**Conclusion:** It is concluded from our study that lipid profiles must be checked regularly in diabetic and non-diabetic patients who also have atherosclerosis to reduce the risk of cardiovascular diseases.

**Keywords:** Cardiovascular diseases, lipids,

**Introduction:** Cardio vascular disease is a major cause of death all over the world and accounts for about 40% of all the deaths in Sri Lanka. Early age higher risk of Acute Myocardial Infections are seen in peoples of South Asia as they develop high risks at a young age. Almost 50% of the deaths related to cardiovascular cause are due to sudden cardiac death and around 25% of these occur in patients who had not been diagnosed with cardiac disease previously. In 80% of the cases of sudden cardiac death, the main factor is coronary artery disease and the risk factors that lead to coronary artery disease also leads to sudden cardiac death. The main risk factors for cardiovascular diseases include diabetes, dyslipidemia, age, hypertension, sedentary lifestyle, alcohol, smoking, family history, obesity and menopause.

In addition to this, fibrinogen, homocysteine, low density lipoprotein, lipoprotein (a), C-reactive protein are provisional risk actors that can lead to cardio vascular diseases. How the management of lipid levels will proceed as a part of modifying the risk factors related to coronary artery disease depends on the lipid profile. Multiple studies have shown that increased levels of Lp(a) is directly related to the future adverse effects of coronary events.

A 3-100 times increase in the risk of coronary artery disease is seen with increase in levels of Lp(a). Variations in the concentration of Lp(a) is because of the genetic difference in individuals regulating apoprotein (a) production. Lp(a) stimulates pro-atherogenic process by different mechanisms like, blocking activation of plasminogen to plasmin, interacting with tissue matrix and fibrin components in vessel wall, blocking plasmin arbitrated activation of TGF-β resulting in increase in number of smooth muscles and promoting inflammation by activating monocyte chemotactic activity of endothelial cells.



Hence in the management of patients with coronary artery disease Lp(a) will be a better risk marker.

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

Subjects	Characteristics	Gender	Age groups		
			45–54 yrs	55–64 yrs	65–75 yrs
N group	Age	M	50.06 ± 0.56	60.28 ± 0.51	70.21 ± 0.5
		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

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

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

**Discussions:** Patients who are suffering from diabetes have higher risk of coronary vascular disease as compared to the ones who do not have diabetes and hence the higher death rate in diabetic patients. Dyslipidemia seen in diabetes is a main

risk factor leading to atherosclerosis, one of the main reason of coronary vascular disease. In our study, modifiable factors like diabetes and non-modifiable factors like gender and age in patients with atherosclerosis are analyzed. According to the



results of our study, HbA1c and fasting blood glucose levels were higher in DA patients as compared to NA. This correlates with the study conducted by Ghazanfari et al in which he showed that HbA1c and fasting blood glucose levels are used to separate the non-diabetics from diabetics. Gender and age had no effect on HbA1c and FBG levels according to our study. However it was seen that in both male and female groups of NA and DA, HbA1c value increased.

Diabetic dyslipidemia is also termed as atherogenic dyslipidemia because of the high levels of triglycerides, cholesterol and decreased levels of high density lipoproteins. Further evaluation was done by exploring the relation of diabetes (which also leads to atherosclerosis) with lipid profiles in 3 different age groups (45-54, 55-64, 65-75 years) in all groups (N,DA,NA) females and males. Our

results depicted a reasonable rise in LDL, TG, TC, and VLDL levels in both males and females of DA group as compared to N and NA groups. DA group also showed a decline in HDL levels as compared to other groups. Furthermore, among the DA group, high levels of TG, TC, VLDL and LDL levels were seen in female patients as compared to male patients along with significantly decreased levels of HDL. Our results are comparable to other studies which show deranged lipid profile in diabetics and normal patients despite the fact that cut off values are slightly different.

**Conclusion:** It is concluded from our study that lipid profiles must be checked regularly in diabetic and non-diabetic patients who also have atherosclerosis to reduce the risk of cardiovascular diseases.

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