Lipid Profile in Diabetic and Non-Diabetics and its Effects

SYED MUHAMMAD AHSAN RAZA[1], RAKHSHANDA JABEEN[2], FAKHAR UN NISA[3]

ABSTRACT

In this study the risk factors like lipoproteins including HDL, LDL, VLDL and cholesterol have to be determined in diabetic and non-diabetics. In this the ratio of cholesterol to HDL and ratio of LDL to HDL has to be determined in diabetic and non-diabetic patients to know the risk of heart diseases. If ratios of these factors increased beyond the normal extent then the risk of heart disease also increases. A lipid profile test level taken from 300 patients reports to check the effect of them on diabetic and non-diabetic patients. And risk of heart diseases occurrence in them.

Keywords: Lipid profile, diabetes, HDL, LDL, VLDL

INTRODUCTION

Coronary heart disease is due to accumulation of lipoproteins in veins and cholesterol deposition. Coronary heart disease is a strong risk factor with the presence of different factors like HDL,VLDL, LDL,GOPT and blood pressure with their ages of patients[1]. The lipoproteins accumulation during coronary heart attack is greater than the diabetes. "Diabetes mellitus is a metabolic complaint/disorder that mainly caused by the defect in insulin receptors, causing the thirst and uric acid secretion in excess from the body. In type 2 diabetes insulin is present, but body become resistance against it[2-3]. The effects of diabetes mellitus cause damage, dysfunction and failure of different organs. Diabetic complications may be related to the vascular or macro vascular complications which causes atherosclerosis, stroke, and peripheral artery disease. Microvascular complications in diabetic leading to end stage renal disease and blindness[1,2]. Plasma triglyceride and LDL cholesterol levels are increased in the case of hyperinsulinemia and also increases very low density lipoprotein (VLDL) synthesis in the liver[3-4]. Lipoprotein lipase resistance in peripheral tissues towards insulin also increases triglyceride and LDL cholesterol levels. The fatty acid coming from adipose tissue in the liver, causing formation of acetyl Co A which converts into VLDL[3]. Functions of the coronary artery atherosclerosis are also disturbed by the diabetes. Plasma proteins cross the endothelial obstacle. At this they are reversed by the collagen and proteoglycans that are like the subendothelial matrix. The matrix molecules are generated by the smooth muscle cells (SMCs) and

----

1Associate Professor Biochemistry, Lahore Medical & Dental College, Lahore
2Associate Professor Anatomy, Sahara Medical College, Narowal
3Associate Professor Physiology, Azra Naheed Medical College, Lahore
Correspondence to Dr. Syed Muhammad Ahsan Raza
Email: muhammadahsan572@gmail.com Cell:

ECs[5-6]. Due to this good cholesterol level decreases and causes the plaque formation in the arteries. Lipids accumulation occur due to increase uptake of lipproteins by scavenger receptors on the smooth muscle cells nad macrophages. The resulting lesions are called the fatty streaks. Plasma lipoproteins deliver the cholesterol to peripheral tissues from the liver, particularly by the apolipoprotein B that are VLDL, LDL and LDL[6]. While HDL moves the cholesterol from the tissues back into the liver and act as good cholesterol. Homeostasis in the body are maintained by both of these well-organized mechanisms and liver is the house of the major metabolic processes like the production and excretion of cholesterol[7,8].

METHOD

For the data collections, arrange the team that went to different labs where test of diabetic patients are taken. We applied there for the reports collection. 1st of all we went to the Malik Haider Hospital lab and get the data of heart patients and diabetics. Then we take the data from the City Hospital, Gujrat and Doctors Hospital, Gujrat. Our main focus was on the different values of blood glucose level, LDL, vLDL, HDL and these values are influenced by the glucose level in the body. Normal value of glucose in the body is between the 90-120mg percent in the body and when it exceeds from it, indicates that person is suffering from the diabetes. Also take the blood pressure of the patients for the comparison to check that what its effect on the heart and diabetes is. How diabetes leads towards the heart diseases.

Variables: Different variables taken and arrange them on the SPSS. And these variables have the universal/standard values. The standard values for the LDL that is used in the lab is up to 130mg%, HDL values for male is40 while for the females is 43, cholesterol normal value for the healthy person should upto 200, triglyceride level must be less than

200, vLDL level is between the 5-50mg%. Total 315 patients were taken for the study

Statistical analysis: Data were analyzed through the SPSS. The mean values of the lipid profile LDL, HDL, vLDL were determined through the descriptive analysis. Mean and their maximum, minimum values of the each variable determined.We perform the independent T test to check what the relation between the diabetes and lipid profile test and what are the chances of heart diseases in the diabetics and non-diabetics. Here take the ρ value of 0.05 or 95 % CI taken as statistically significant value.

RESULTS AND DISCUSSION

About 300 patients data obtained and analyzed to check the effect of different variables on the diabetes and non-diabetes condition and different factors ratios that can lead towards the heart diseases. SPSS a statistical tool is used to analyze the link of diabetes with LDL, HDL, cholesterol, triglyceride cholesterol. Data has been collected for around 300 patients from city hospital, Malik Haider hospital, Aziz Bhatti Shaheed hospital and Doctor's hospital Gujrat. According to the reference values set by WHO for normal fasting blood glucose level that is 90 to 110. 37 males were non diabetic and 134 males were diabetic and 29 females were non diabetic and 100 females were diabetic according to the results analyzed by the SPSS (Table 1). It means that the prevalence of diabetic in females is more than in males. With the increase of age the chances of type II diabetic also increases.

Statistics: The average age mean of 300 individuals for non-diabetic patient is 47.77 and average mean age for diabetic is 52.1966. The p value of age is 0.017 which shows that with the increase in age the chances of diabetics also increase. The lipid profile of these diabetic and non-diabetic individuals were checked and compared. According to statistical analysis made from the SPSS the average mean of SGOT in non-diabetic is 3.55 and diabetic are 2.4. The average mean level of LDL, VLDL, HDL, cholesterol, triglycerides and other factors for diabetic and non-diabetic patients were mentioned in the table 2.

The p value of for LDL, cholesterol to HDL and ratio of LDL to HDL were less than 0.05 which shows that with the increase in blood glucose level there is an increase in the level of LDL while cholesterol and HDL decreases.

The p values of different variables are shown in the table 3.

Table 1:

Gender Diabetes Status	Gander	Diabetes Status
Male Non Diabetic N valid Missing	37 0	37 0
Non Diabetic N valid Missing	134 0	134 0
Female Non Diabetic N valid Missing	29 0	29 0
Non Diabetic N valid Missing	100 0	100 0

Table 2

	Diabetes Status	N	Mean	Std. Deviation	Std. Error Mean
Age	Non Diabetic Diabetic	66 234	47.7727 52.1966	12.82881 13.29283	1.57912 .86898
FBG	Non Diabetic Diabetic	66 234	89.3788 2.0652E2	24.15639 60.72235	2.97345 3.96954
LDL	Non Diabetic Diabetic	66 234	2.2224E2 2.9913E2	99.64121 202.54662	12.26499 13.24089
VLDL	Non Diabetic Diabetic	66 234	1.2621E2 1.4629E2	117.54953 187.71927	14.46935 12.27159
HDL	Non Diabetic Diabetic	66 234	31.7424 28.3675	17.36337 16.78447	2.13728 1.09724
Cholesterol	Non Diabetic Diabetic	66 234	6.7850E2 7.7394E2	245.34442 762.95875	30.19981 49.87617
Triglycerides	Non Diabetic Diabetic	66 234	2.9541E2 2.8743E2	151.06901 154.44995	18.59531 10.09671
Ratio Of Cholesterol to HDL	Non Diabetic Diabetic	66 234	29.1012 40.7669	25.24563 56.55551	3.10752 3.69715
Ratio of LDL to HDL	Non Diabetic Diabetic	66 234	9.8080	10.57792	1.30205

Table 3: Independent samples test

		Levene's test for equality of variances					T-test for equality
		F	Sig.	T	Df	Sig.(2-talled)	Mean Difference
Age	Equal variances Assumed	.342	.559	-2.406	298	.017	-4.42385
	Equal Variances not Assumed			-2.454	107.576	.016	-4.42385
FBG	Equal variances Assumed	40.334	.000	-15.319	298	.000	-117.14258
	Equal Variances not Assumed			-23.619	266.767	.000	-117.14258
LDL	Equal variances Assumed	32.593	.000	-2.981	298	.003	-76.88578
	Equal Variances not Assumed			-4.260	221.042	.000	-76.88578
VLDL	Equal variances Assumed	4.918	.027	-.824	298	.411	-20.07848
	Equal Variances not Assumed			-1.058	167.903	.291	-20.07848
HDL	Equal variances Assumed	.641	.424	1.432	298	.153	3.37490
	Equal Variances not Assumed			1.405	101.805	.163	3.37490
Cholesterol	Equal variances Assumed	2.379	.124	-1.001	298	.318	-95.44017
	Equal Variances not Assumed			-1.637	293.669	.103	-95.44017
Triglycerides	Equal variances Assumed	.015	.904	.373	298	.710	7.98174
	Equal Variances not Assumed			.377	106.396	.707	7.98174
Ratio of cholesterol to HDL	Equal variances Assumed	4.979	.026	-1.629	298	.104	-11.66568
	Equal Variances not Assumed			-2.415	243.272	.016	-11.66568
Ratio Of LDL To HDL	Equal variances Assumed	9.483	.002	-2.394	298	.017	-7.07122
	Equal Variances not Assumed			-3.528	239.572	.001	-7.07122

CONCLUSION

Our study has shown that the prevalence of heart diseases and liver damage increases with the increase in fasting glucose level. The data collected from different hospital analyzed by SPSS showed the correlation of diabetes type II with different variables. The results have shown that diabetes type II is a multifactorial disease which damage different organs. In type II diabetes there is an increase in risk of cardiovascular disease and liver damage as most heart and liver enzymes show abnormalities.

REFERENCES

1. Dungan, KM, Buse, JB, Largay, J, Kelly, MM, Button, EA, Kato, S (2006) 1,5-anhydroglucitol and postprandial hyperglycemia as measured by continuous glucose monitoring system in moderately controlled patients with diabetes. Diabetes Care 29: pp. 1214-9
2. Standards of medical care in diabetes– 2010. Diabetes Care 33 Suppl 1: pp. S11-61
3. Vague, J, Vague, P, Tramoni, M, Vialettes, B, Mercier, P (1980) Obesity and Diabetes. Acta Diabetol Lat 17: pp. 87-99
4. Puigserver, P, Rhee, J, Donovan, J, Walkey, CJ, Yoon, JC, Oriente, F (2003) Insulin-regulated hepatic gluconeogenesis through FOXO1-PGC-1alpha interaction. Nature 423: pp. 550-5
5. Kendall, DM, Sobel, BE, Coulston, AM, Peters Harmel, AL, McLean, BK, Peragallo-Dittko, V (2003) The insulin resistance syndrome and coronary artery disease. Coron Artery Dis 14: pp. 335-48
6. Haffner, SM (2006) Relationship of metabolic risk factors and development of cardiovascular disease and Diabetes Obesity 14: pp. 121S-7
7. Fonseca, VA (2000) Risk factors for coronary heart disease in diabetes. Ann Intern Med 133: pp. 154-6
8. Suzuki, T, Katz, R, Jenny, NS, Zakai, NA, LeWinter, MM, Barzilay, JI (2008) Metabolic syndrome, inflammation, and incident heart failure in the elderly: the cardiovascular health study. Circ Heart Fail 1: pp. 242-8