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STUDY OF SERUM TRIGLYCERIDE LEVEL IN TYPE 2 DIABETES PATIENTS ATTENDING RAIPUR INSTITUTE OF MEDICAL SCIENCES

Biochemistry

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ABSTRACT

Diabetes is the most common metabolic disease in humans that is increasing the prevalence in the world. The objective of this study is to estimate the lipid profile parameters & assess hypertriglyceridemia analyzer ERBA EM 200. The results were then maintained in MS Excel and were analyzed using test of proportion & significance. The results of serum lipid profile showed that mean values for TG, TC, HDL in diabetic patients were 273.10±116.63, 189.57±42.14, 43.70±9.66. The mean values of fasting blood glucose, total cholesterol, triglyceride for diabetes mellitus type 2 Diabetes mellitus patients were highly significant than their non diabetic counterparts. Thus increased level of triglyceride is an indicator of glycemic control. The prevalence of dyslipidaemia is high. The study has concluded that type 2 diabetic show marked hypertriglyceridemia. This study has been helpful for all community for early detection of cardiovascular disease in type-2 diabetes patients which are very cost effective.

KEYWORDS

Diabetes, triglyceride, HDL, LDL, dyslipidemia.

INTRODUCTION

Diabetes Mellitus (DM) is a hereditary chronic and endocrine metabolic disorder which causes death worldwide, which is characterized by raised triglycerides (TG), low high density lipoprotein- cholesterol (HDL-C) and high low density lipoprotein (LDL) particles. It may be present at diagnosis of type 2 Diabetes Mellitus and is a component of metabolic syndrome [1]. A long standing association exists between elevated triglyceride levels and cardiovascular disease. However, the extent to which triglyceride directly promote cardiovascular disease or represent a biomarker of risk has been debated for three decades [2]. Dyslipidaemia is commonly seen in type 2 Diabetes Mellitus is one of the most common secondary cause of dyslipidaemia and vascular complications of diabetes has long been of interest because both tend to occur with greater frequency in type 2 Diabetes Mellitus [3]. Although serum triglyceride maybe a significant risk factor for coronary heart disease in Asian diabetic patients, clinical trials evaluating whether lowering triglycerides using fibrates can reduce the risk of coronary heart disease in these patients needs to be initiated [4]. Particularly in type 2 Diabetes Mellitus, hypertriglyceridemia has been shown to cause endothelial dysfunction and predisposing to atherogenesis. Many studies have also indicated an important predictive role of increase serum triglyceride levels contributing to the risk for CVD especially in type 2 diabetics. In type 2 Diabetics high triglyceride level and low HDL-C levels frequently co-exists, which are important factor for CVD. This makes identification; critical evaluation and follow up of serum triglyceride in type 2 Diabetes Mellitus continue to be important[2,4].

MATERIALS AND METHODS

The present study was carried out in the Department of Biochemistry RIMS, Raipur. A total of 60 Samples will be collected from the Biochemistry Laboratory of Raipur Institute of Medical Sciences, Raipur during a time period of 2 months. Fasting blood samples was collected in plain vial from diagnosed cases of type 2 diabetes mellitus & Non diabetic controls. About 5 ml of blood was drawn using perfectly dry & sterile syringes & the blood will transferred to plain vial. Serum was separated within 2 hours of collection to prevent artificial changes in the concentration of lipids. The blood will be centrifuged at 2000 rpm for 10 minutes. The supernatant clean serum was then pipette out using micropipette with disposable tips & transfer to the sample cups & analyzed by fully automated chemistry analyzer ERBA EM 200. Samples were processed for estimation of Total Cholesterol, HDL-C &Triglycerides. All data was maintained in Microsoft office Excel. All the tabulated data was then analyzed using Excel and appropriate Statistical tools like tests of proportion and test of significance like Pearson's correlation & Chi Square Test.

RESULTS

The results of serum lipid profile showed that mean values for TG, TC, HDL in diabetic patients were 273.10±116.63, 189.57±42.14, 43.70±9.66. The mean values of fasting blood glucose, total cholesterol, triglyceride for diabetes mellitus type 2 Diabetes mellitus patients were highly significant than their non diabetic counterparts. The result in Table 1 show that FBS, PPBS, TG, and TC & TC: TG ratio was significantly different in type 2 diabetes patients & non-diabetic controls.

Table 1: Comparison between different studied groups regarding different parameters

Parameters	Non-diabetics (Mean±SD)	Diabetic Patients (Mean±SD)	t-Test	p-Value
Fasting Blood Sugar	95.07±7.54	174.57±43.21	9.92	<.001**
Post-Prandial Blood Sugar	133.50±4.09	251.57±60.19	10.71	<.001**
Triglycerides	103.20±27.01	273.10±116.63	7.77	<.001**
Total Cholesterol	153.97±32.67	189.57±42.14	3.65	<.001**
HDL	51.57±16.79	43.70±9.66	-2.22	.030*
LDL	79.34±30.78	89.46±38.55	1.12	.266
VLDL	20.42±5.62	52.40±21.82	7.77	<.001**
Total Cho/HDL	3.15±0.78	4.41±0.95	5.57	<.001**
LDL/HDL	1.61±0.66	2.07±0.9	2.21	.031*

** Denotes high significance at 1% significance Level.
* Denotes significance at 5% significance Level.

DISCUSSION AND CONCLUSION

In the present study 60 subjects were enrolled irrespective of sex and age group of 18-50 years. The samples were taken from both OPD and IPD patients. This study revealed the parameters of lipid profile and lipoproteins were elevated in Type-2 diabetic as compared to non-diabetic subjects. The results also revealed that there is high elevation of total cholesterol, triglyceride and total cholesterol – high density lipoprotein ratio which are highly significant at 1% significance level and low level of high density lipoprotein, high density lipoprotein – low density lipoprotein ratio are significant at 5% significance level in Type-2 diabetes which are more specific and accurate indices for assessing Coronary Artery Disease than considering total cholesterol, triglycerides, high density lipoprotein and low density lipoprotein levels. Diabetic patients have many complications with elevated cholesterol. Triglycerides, low high density lipoproteins and preponderance of abnormalities in the composition of the smaller dense particles [5]. Results of prospective studies also suggest that people with diabetes have a greater risk of Cardio Vascular Disease [6].

Generally patient with Type-2 diabetes compared to healthy ones have different triglyceride and cholesterol metabolism because they synthesize higher level of triglyceride and cholesterol [7]. Studies have shown that patients with Type-2 diabetes who does not have any familial history of Cardiovascular disease as non-diabetic patients with Cardiovascular disease are at risk. The risk of dangerous and deadly heart attack arises in diabetic patients with cardiovascular. Older age, obesity, familial history of diabetes, poor nutrition and physical inactivity are considered principal risk factor for these diseases [8]. The study was concluded from the results of the present study that type-2 diabetics were dyslipidaemia was very common and the results suggest very strongly that further investigations should relate the effects of dyslipidaemia and abnormalities of type-2 diabetics. In this study serum triglyceride level has shown persistent increase in type-2 diabetic patients which is an indicator of uncontrolled diabetes as its direct correlation is with blood glucose levels. This study has been helpful for all community for early detection of cardiovascular disease in type-2 diabetes patients which are very cost effective.

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