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EVALUATION OF LIPID PROFILE AND BIOCHEMICAL PARAMETERS IN DIABETES MELLITUS

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ABSTRACT

Aim: To evaluate the levels of lipid profile and other biochemical parameters from the patients who have came for normal routine check up at the treatment centre.

Material and Methods: BMS autoanalyiser was used to evaluate the samples.

Result and conclusion: High significant difference in the levels of Cholesterol, LDL and Neutrophils were reported between control samples and diabetic patients.

Conclusion: Concluded that during whole year of assessment; lipid profile was highly altered.

Abbreviations: Low Density Lipoproteins (LDL), Very Low Density Lipoproteins (VLDL), HDL (High Density Lipoproteins), TG (Triglyceroids), SGOT (Serum Glutamate Oxaloacetate Transaminase), SGPT (Serum Glutatmate Pyruvate Transaminase), TSH (Thyroid Stimulating Hormone)

INTRODUCTION

Diabetes mellitus is categorised by the increased glucose concentration in blood. However, not a single factor is responsible for diabetes mellitus. Disturbances in a single pathway may initiate a cascade of biochemical reactions which can cause diabetes mellitus. Diabetes is classified into three major classes, including Type 1 or IDDM (Insulin Dependent Diabetes Mellitus), Type 2 or IIDM (Insulin Independent Diabetes Mellitus) and Gestational Diabetes [1]. In India 40 % people are diabetic which may expected to raise more unless urgent preventive step are taken [2]. Many researchers have worked on Diabetes Mellitus to know about its biochemistry and molecular biology. Clinically, status of lipid profile exerted many effects on Diabetes mellitus either of any class [3].

Altered lipid profile can cause many diseases among which, cardiovascular diseases and coronary artery disease, especially myocardial infarction is more common. Diabetes Mellitus with cardiovascular disease have increased the morbidity worldwide. Many studies, shows that atherosclerosis and hyperglycaemia are associated with type 2 diabetes mellitus. Dyslipidemia imparts its pivotal role in diabetes mellitus. The altered levels of LDL, HDL and cholesterol may give a sign for early diagnosis and prognosis of diabetes mellitus. The various biochemical parameters may altered in diabetes mellitus which can give a clue for metabolic disturbances which may lead to diabetes mellitus [4,5,6].

MATERIAL AND METHODS

Sample Collection: Samples were collected form "Laharwani Diabetes Care Centre" of Dr. Laharwani, Located at ramdaspeth, Nagpur, Maharshtra , India. This work has been based on data collected in the March 2013- February 2014 form the patients who came for routine blood and biochemical investigations at the treatment centre. Signed consents were taken from diabetic as well as from the control patients.

Sample Preparation: 2 ml blood sample was collected from each patient and from each control subjects in non anticoagulant tube and allow the blood to clot. The collected blood samples were then centrifuged at 3000 rpm for 15 minutes to separate out the serum.

Analysis of the Samples: All analysis were done using fully automated Micros 60 by horiba analizer using all standard kits. Protocols were run according to the manufacturer's instructions. All results were reported in their standard units.

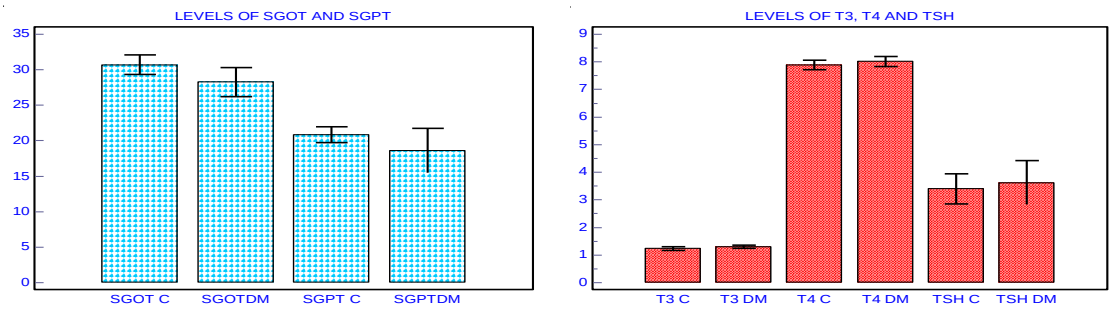
Statistical Analysis: All statistical analyses were done using Med Calc software. Student "t"test was used to differentiate between the two parameters. 0.05 was taken as a significant level.

Table 1. General data about the patients and control samples

PARAMETER	GROUP	MEAN±SEM
AGE	CONTROL	46.21±3.9
	DIABETES MELLITUS	49.64±2.9
FASTING GLUCOSE	CONTROL	64.35±2.8
	DIABETES MELLITUS	158.71±8.8
POST PRANDIAL GLUCOSE	CONTROL	112.85±2.3
	DIABETES MELLITUS	236.92±11.40

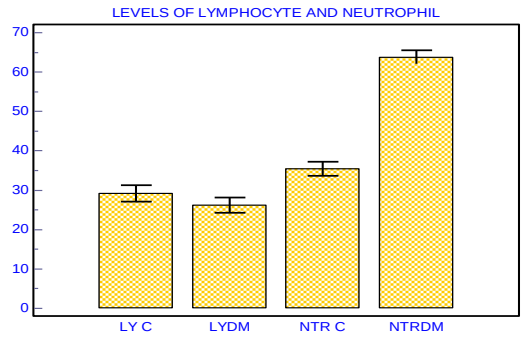
Table 2. Statistical analysis of different biochemical parameters.

PARAMETER	NORMAL RANGE	GROUP	MEAN±SEM	P VALUE
SGOT	12-37 IU / mL	CONTROL	30.71±1.3	
		DIABETES MELLITUS	28.27±2.0	0.3
SGPT	3-25 IU / mL	CONTROL	20.85±1.1	
		DIABETES MELLITUS	18.59±3.1	0.5
T3	70-132 ng/dL	CONTROL	1.23±0.07	
		DIABETES MELLITUS	1.30±0.05	0.4
T4	9-24 P mol/L	CONTROL	7.8±0.1	
		DIABETES MELLITUS	8.02±0.1	0.6
TSH	0.4-4.6 uU/ mL	CONTROL	3.40±0.54	
		DIABETES MELLITUS	3.62±0.79	0.8
NEUTROPHIL	40-75%	CONTROL	35.42±1.76	
		DIABETES MELLITUS	63.78±1.72	<0.0001
LYMPHOCYTE	20-45%	CONTROL	29.21±2.11	
		DIABETES MELLITUS	26.21±1.99	0.3
CHOLESTEROL	<200 mg/dL	CONTROL	176.50±4.5	
		DIABETES MELLITUS	152.85±5.9	0.004
HDL	40-60 mg/dL	CONTROL	38.64±2.8	
		DIABETES MELLITUS	48.28±4.7	0.09
LDL	<130 mg/ dL	CONTROL	122.71±7.6	
		DIABETES MELLITUS	82.57±5.3	0.0002
VLDL	10-40	CONTROL	25.07±1.7	
		DIABETES MELLITUS	31.85±3.2	0.07
TG	<250 mg / dL	CONTROL	159.14±9.6	
		DIABETES MELLITUS	152.00±16.0	0.7



(A)

(B)



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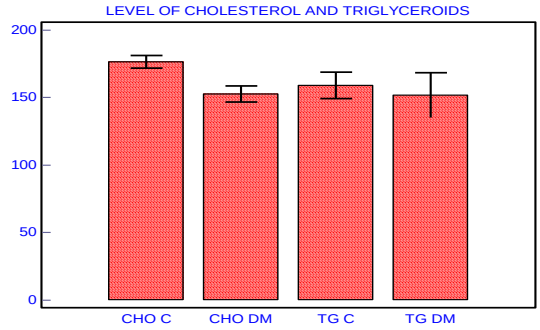

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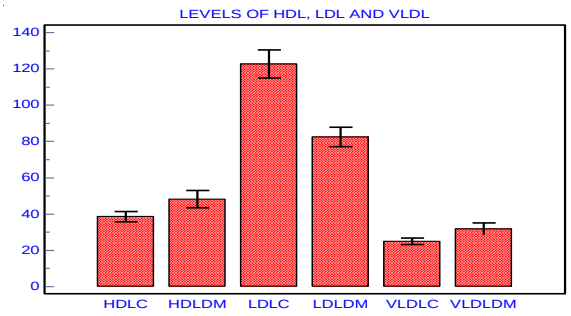

(E)

Fig 1: Figures A shows the levels of sgot and sgpt, figure B shows the levels of T3,T4 and TSH, figure C shows the levels of lymphocytes and neutrophil, figure D shows the levels of cholesterol and triglycerides and figure E shows the levels of HDL, LDL and VLDL.

RESULT AND DISCUSSION

In the present study, Table 1 indicates the general data about the patients and the control samples. Table 2 indicates the statistical analysis of different biochemical parameters. Results showed that there is no significant difference between the activity of SGOT ($p>0.05$) and SGPT ($p>0.05$) in control as well as diabetic patients [table 2, fig A]. The present study corroborates that there was no significant difference in the levels of T3 ($p>0.05$), T4 ($p>0.05$) and TSH ($p>0.05$) between control and diabetic patients [table 2, fig B]. There was no significant difference between the levels of lymohocyte in control and diabetic patients

($p>0.05$) [table 2, fig C] but the present study indicates a highly significant difference between the levels of neutrophil ($p<0.001$) [table 2, fig C].

Significant difference was observed in levels of cholesterol between control and diabetic samples ($p<0.05$) [table 2 , fig D]. But no significant difference has been reported in the concentration of triglyceroids between controls and diabetic samples [table 2, fig D]. No significant difference has been reported in the concentration of HDL between the controls and diabetic samples [table 2, fig E]. High significant defence has been reported in LDL concentration between controls and diabetic patients [table 2, fig E]. Likewise HDL, no significant difference has been reported in the levels of VLDL in control and diabetic samples [table 2, fig E].The result that we have obtained in this study is accordance to the other studies [7-12].

CONCLUSION

The present study was undertaken to evaluate the levels of lipid profile and other biochemical parameters from the patients who have came for normal routine check up during the year March 2013- February 2014. Statistical analysis shows highly significant difference in the levels of neutrohils LDL and cholesterol. No significant difference has been reported in other selected parameters. Findings of this study clearly indicate that lipid profile is highly altered during a year, which may give rise many new clues related to diabetes mellitus. There is need to do more research in this aspect.

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