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To Compare the Lipid Profile in Uncomplicated and Complicated Type Ii Diabetes Mellitus (Niddm)

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ABSTRACT

Introduction - The incidence of diabetes mellitus (DM) in human population has reached to epidemic proportions worldwide. In long standing diabetes there are various complications such as microvascular, macrovascular and neuropathic. This has been attributed to the hyperlipemia and hypercholesterolemia of chronic diabetes state .The present study was undertaken to assess the correlation between disordered lipid profile (i.e. dyslipdemia) and progression of disease (i.e. type II DM).

Aims and objectives –1. To estimate the serum lipid profile in control, uncomplicated type 2 DM group and complicated type 2 DM group.and. to compare the serum lipid profile amongst control, uncomplicated type 2 DM group and complicated type 2 DM group.

Materials and methods – Total 90 subjects (both male & female) of age group 35-60 yrs. were selected for study. Lipid profile was estimated by CE-CO-PAP method (for total cholesterol & HDL-c estimation) & by GPO-PAP End pt. method (for TG estimation).

Observations and results –It was found that average serum values of lipid profile were significantly increased (except HDL) in complicated type 2 DM as compared to uncomplicated group. Also, as compared to control group, all the values of lipid profile (except HDL) were significantly increased & HDL-c was significantly decreased in complicated group.

Conclusion – The study indicated a definite positive correlation between dyslipidemia and development of chronic complications. (especially macroangiopathic).

INTRODUCTION –

The incidence of diabetes mellitus (DM) in human population has reached to epidemic proportions worldwide and it is increasing at the rapid rate. 90% of the present cases are type II Diabetes & most of the increase will be in type II paralleling the increase in incidence in obesity. It has been called ' more a disease of lipid than of carbohydrate metabolism.' In long standing diabetes there are various complications such as microvascular, macrovascular and neuropathic.(1)

This has been attributed to the hyperlipemia and hypercholesterolemia of chronic diabetes state (2) and this increase is progressive with seriousness of the condition.(3)

Each of the lipid abnormalities (i.e. ↑ cholesterol, ↓ HDL-c, ↑ VLDL-c, ↑ LDL-c, ↑ TG etc) is an independent risk factor for coronary heart disease and hence insulin resistance states should be identified as early as possible in patients and these lipid abnormalities should be assessed and treated .(4)

The present study was undertaken in order to assess the correlation between disordered lipid profile (i.e. dyslipdemia) and progression of disease (i.e. type II DM & its complications).

AIMS AND OBJECTIVES -

1. To estimate the serum lipid profile in control, uncomplicated type 2 DM group and complicated type 2 DM group.
2. To compare the serum lipid profile amongst control, uncomplicated type 2 DM group and complicated type 2 DM group.

MATERIALS AND METHODS -

Selection of subjects:-

Total 90 subjects were selected of age group (35-60 yrs) , including both sexes and divided into 3 equal groups as -

Gr. I - Control group. including normal, healthy subjects.
Gr. II - Patients with uncomplicated type II DM
Gr. III - Patients with complicated type II DM, having complications like diabetic retinopathy, nephropathy, coronary heart disease , hypertension etc.Type II DM patients were selected from the diabetic clinic, sasoon General Hospital, pune.

All the patients were maintained on antidiabetic treatment..

To all the groups following exclusion criterion was applied :-

Cigarette smoking; alcoholism; obesity based on body mass index (BMI) and waist/hip ratio; past H/o hypertension; patients on antilipid treatment .

The study was approved by the ethical committee of B.J.Medical college,pune .

Blood samples were collected after overnight fasting for separation of sera.

Methods :

1) Total cholesterol and HDL-c were estimated by cholesterol esterase-cholesterol oxidase-peroxidase (CE-CO-PAP) colorimetric method.
2) Triglycerides were estimated by Glycerol -3- phosphate oxidase-peroxidase (GPO-PAP) end point method.
3) VLDL & LDL were estimated as (a) VLDL (mg%) =Triglycerides / 5
   (b) LDL (mg%) =Total cholesterol – [HDL+VLDL]

All the values of serum lipid profile were arranged in tabular form and statistically analysed by applying unpaired 't' test.

Observations and Results -

(I) Comparison between average values of serum total cholesterol, TG, HDL-c, LDL -c, and VLDL-c in control group (i.e.group I) and uncomplicated type II DM group(i.e.group II) :-

	Total cholesterol (mg%)	TG (mg%)	HDL-c (mg%)	LDL-c (mg%)	VLDL-c (mg%)
Group I Mean SD	172.9 ± 30.1	125.2 ± 27.8	49.4 ± 11.01	98.6 ± 32.4	24.14 ± 7.2
Group II Mean SD	242.7 ± 55.4	146.1 ± 63.5	44.5 ± 10.77	168.5 ± 53.9	29 ± 12.9
Difference between means	69.8 *	20.9	4.4	69.9 *	5.86

* P < 0.05 (Significant)

In table

(I), it was observed that in group II , average values of total cholesterol and low density lipoproteins were significantly increased as compared to group I.

(II) Comparison between average values of serum total cholesterol, TG, HDL-c, LDL -c, and VLDL-c in control group (i.e.group I) and complicated type II DM group(i.e.group III) :-

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	Total cholesterol (mg.%)	TG (mg.%)	HDL-c (mg.%)	LDL-c (mg.%)	VLDL-c (mg.%)
Group I Mean SD	172.9 ± 30.1	125.2 ± 27.8	49.4 ± 11.01	98.6 ± 32.4	24.14 ± 7.2
Group III Mean SD	290.7 ± 57.2	192.8 ± 93.5	42.9 ± 7.8	209.3 ± 55.8	38.53 ± 18.72
Difference between means	117.8 *	67.6 *	6.5 *	110.7 *	14.39 *

* P < 0.05 (Significant)

In table

(II), it was observed that in Group III , average values of total cholesterol. Triglycerides, HDL-c, LDL-c and VLDL-c were significantly increased as compared to group I .

(III) Comparison between average values of serum total cholesterol, TG, HDL-c, LDL -c, and VLDL-c in uncomplicated type II DM group (i.e.group II) and complicated type II DM group (i.e.group III)

	Total cholesterol (mg.%)	TG (mg.%)	HDL-c (mg.%)	LDL-c (mg.%)	VLDL-c (mg.%)
Group II Mean SD	242.7 ± 55.4	146.1 ± 63.5	44.5 ± 10.77	168.5 ± 53.9	29 ± 12.9
Group III. Mean SD	290.7 ± 57.2	192.8 ± 93.5	42.9 ± 7.8	209.3 ± 55.8	38.53 ± 18.72
Difference between means	48 *	46.7 *	1.6	40.8 *	9.53 *

* P < 0.05 (Significant)

In table III, it was observed that in Group III , average values of total cholesterol, TG, LDL-c and VLDL-c were significantly increased as compared to Group II.

DISCUSSION -

Average duration of illness in complicated type II DM group was found to be 7.4 ± 5 yrs. as compared to that in uncomplicated group where it was only 2.8 ± 2 yrs. The findings in our study are supported by study done by John D. Bagdade et.al. in 1967 who stated that Lipaemic Syndrome usually occur in those whose diabetes is poorly controlled, who has chronic insulin insufficiency and who are symptomatic for long periods (5) , West K.M. et.al. found in 1978, a direct relationship between duration of diabetes and macrovascular disease (6)

Insulin plays important role in inhibiting intracellular hormone sensitive lipase of adipose tissue and activating lipoprotein lipase (1) . Because of lack of insulin action in type II DM, the activity of hormone sensitive lipase increases which causes increased lipolysis leading to increased FFA which are then catabolised to acetyle CoA in liver and other tissues. Excess acetyle – CoA gets converted to more and more cholesterol and its concentration in blood increases . VLDL-c and LDL-c increases either because of increased hepatic production of VLDL-c or decreased removal of VLDL-c and LDL-c from circulation .Serum concentration of TG also increases because of decreased removal from circulation (1).

Serum HDL-c concentrationd decreases due to excess catabolism and also there is negative relationship between HDL-c & LDL-c (7).

In 1970, Pell S and D'Alonzo found that macroangiopathy is accelerated by severity of type 2 DM (8).

UGDP studies in 1970, suggested that there was not reduction in cardio-vascular mortality or morbidity in NIDDM when treated with oral hypoglycemic drugs (9).In present studies, it can be stated that in complicated type II DM group; dyslipedimia could be due to continued progression of carbohydrate disorder due to prolonged state of illness with inadequate control of disease, and absence of specific antilipid therapy.

SUMMARY AND CONCLUSION -

The present study strongly suggest that timely intervention with appropriate antilipid drugs is necessary in diabetic dyslipidemia to bring back the serum. lipid profile to near normal levels in order to prevent or decrease future long term complications related to it.

Further studies are required to know the influence of various other factors on lipid level and obtain precise correlation between dyslipidemia and DM

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