SPECTRUM OF LIPID CHANGES IN OBESE AND NON-OBESE DIABETICS IN PESHAWAR

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ABSTRACT

Background: All lipid fractions were found to be deranged in obese and non-obese diabetics . It was concluded that dyslipidemia are common in all diabetics. The abnormal lipids can improve with good glycaemic control, but do not reach the normal state.

Research Methodology: This study was carried out on 160 subjects comprising 120 obese and 40 non-obese diabetics from Peshawar district. All patients had their lipid profiles checked after over night fast.

Results: The serum total cholesterol in obese diabetic was found to be non significant as compared to non-obese diabetics. While the serum triglyceride in obese diabetics found to be significantly increased as compared to non obese. The serum HDL-C in obese diabetics was found to be decreased and finally LDL-C was increased in both the groups.

Conclusions: Good glycaemic control, weight reduction, periodic checkups of lipids and blood glucose are recommended for all diabetics in order to avoid complications.

Key words: Lipids, obese, non-obese, type 2 diabetics.

INTRODUCTION

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia. The underlying metabolic disturbances involve not only carbohydrates but also lipids and proteins as well. Diabetes is one of the five leading causes of death in developed countries and is expected to reach epidemic proportions in developing countries by year 2025. Dyslipidemia is very common in type 2 diabetes and it is characterized by hypertriglyceridemia and low levels of high density lipoprotein cholesterol (HDL-C), an important cause of morbidity.[1]Diabetes has emerged as a major health problem in Pakistan. Atherosclerosis is the most important complication that ultimately leads to cardiac and other vascular events responsible for increased morbidity and mortality in diabetes. Dyslipidemia are basic causative factor for increased incidence of atherosclerosis in diabetes[2]. Diabetes mellitus is usually associated with dyslipidemia and obesity as well.[3] The statistical unit used for obesity measurement is the body mass index.(BMI) Body mass index equals to a person's weight in kilograms divided by height in meter squared (BMI=kg/m2).[4]

In our diabetic population, lipid control is usually poor due to various reasons like ignorance, socio-economic and false beliefs of treatment, hence it is noted that in our population complications of diabetes are more pronounced and higher as compared to the west. There fore this study was designed to assess hyperlipidemia in obese and non-obese diabetics and to understand the relationship of hyperlipidemia with severity of obesity in diabetics in our community.

RESEARCH METHODOLOGY

Patients were randomly selected from department of Pathology, Khyber Medical College, Peshawar. One hundred and sixty (160) subjects were included in this study aged 40-80 years, diabetic patients included 120 obese and 40 non-obese (according to the BMI criteria). All Patients included in this study were established type 2 diabetics, of both sexes. Patients with primary hyperlipidemia, hypertension, cushing syndrome, thyroid diseases, liver diseases, nephrotic syndrome, acromegaly and chronic pancreatitis following pancreatic surgery were excluded because they effect lipid status. So also were excluded the patients using drugs which may affect lipid metabolism e.g betablockers, steroids, statins etc.

Lipid profile evaluation included serum cholesterol, triglyceride, HDL-C, LDL-C levels. The sample were taken after 14 hour fast. Data obtained was subjected to statistical package SPSS V13 (Special package for social sciences), arithmetic mean, standard deviation, degree of freedom, chi square distribution and ultimately p-value were calculated.[5]

RESULTS

All patients had their total cholesterol (TC), triglycerides (TG), low density lipoprotein choles-

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terol (LDL-C) and high density lipoprotein cholesterol (HDL-C) analyzed. The results are as under.

The serum total cholesterol (TC) in obese diabetic was found to be non significant as compared to non-obese diabetic. Both the groups showed almost the same serum cholesterol concentration. The p value was non- significant for both groups i.e.0.682. The serum triglyceride (TG) in obese diabetics was found to be significant as compared to non-obese diabetics.

Hypertriglyceridemia in diabetics is the most prominent abnormality. The p value was found to be significant 0 .007.The serum HDL-C in obese diabetics was found to be significant when compared with non-obese diabetics. The level was observed normal in non- obese group while lowered level in obese group. The p value was 0 .023. The serum LDL-C in obese diabetics was found to be non significant as compared to non-obese diabetics, they showed slightly elevated level of LDL-C. The p value was 0.071

Table 1: Serum total cholesterol (Chi-square 0.764, p-value =.682) (P>0.05)

Subgroups		Values	Obese diabetics (%)	Non bese diabetics(%)
A	Total Cholesterol	<160	23 (19.17)	5 (12.5)
B		160-200	39 (32.5)	17 (42.5)
C		200+	50(41.66)	19 (47.5)
	Total		120	40

Table 2: Serum triglycerides (Chi-square 9.963, p-value =.007) (P<0.05)

Subgroups			Obese diabetics (%)	Non obese diabetics(%)
A	NTG	<100-	8 (6.67)	5 (12.5)
B		100-200	47 (39.16)	16 (40)
C		200+	73 (60.83)	18 (45)
	Total		120	40

Table 3.: Serum HDL-C (Chi-square 3.7, p-value =.023) (P<0.05)

Subgroups	HDL	Obese Diabetics (%)	Non obese Diabetics (%)
A	<30	48 (40)	7 (17.5)
B	30-70	64 (53.3)	27 (67.5)
C	70+	8 (6.66)	6 (15)
	Total	120	40

Table 4: Serum LDL-C (Chi-square 3.812, p-value =.071) (P>0.05)

Subgroups			Obese(%)	Non-obese(%)	Total(%)
A	LDL	<100	55 (45.8)	9(22.5)	64(40)
B		100-150	52 (43.3)	25(62.5)	77(48.1)
C		150+	13 (10.8)	6(15)	19(11.8)
	Total		120	40	160

DISCUSSION

Dyslipidemia in diabetes have been described many time in numerous studies with consistent findings and few differences[2]. A major confounding factor in interpretation of lipid levels in studies carried out on type 2 diabetics is the presence of obesity; the latter is not only more frequent in type 2 diabetes, but is also associated with raised triglycerides and low HDL-C.[6]

The American Diabetes Association has reported that well controlled type 1 diabetics have a lipid disorder similar to the rest of the population, while type 2 diabetics have mixed hyperlipidemia with high cholesterol, high triglyceride, low HDL-C and high LDL-C levels. The dyslipidemic effect of type 2 diabetics persists even after a glycemic control has been achieved[7].The raised LDL-C was reported in another study in the country.[8]

Amongst dyslipidemia the hypertriglyceridemia is the most predominant abnormality, it is more common in type 2 diabetics than type 1.[9] It is more common in diabetics as compared to non-diabetics due to four fold increase in VLDL triglyceride.[10]It predisposes the patients to life threatening complications like diabetic ketoacidosis, coronary artery disease and lipaemia retanalis.

In a study conducted in Russia dyslipidemia was detected in 84.3% diabetic patients, the frequency of hypertriglyceridemia was 31.4% in that study.[11]

In another study hypertriglyceridemia has been found in 42.4% of diabetic patients, out of which 30 % had hypertriglycerdemia.[12]

These observations have marked resemblance to the results of present study, which also showed elevated cholesterol, triglycerides and LDL-C in both the groups and low HDL-C in obese diabetics while normal HDL-C in non-obese group.

Lately UK propective diabetes story (UKPDS).[13] diabetes control and complication trial (DCCT) and decode study[14] group have all concluded that intensive blood glucose control in diabetes significantly reduces micro vascular and macro vascular complications.

CONCLUSION

Good glycaemic control, weight reduction, periodic checkups of lipids and blood glucose are recommended for all diabetics in order to avoid complications like atherosclerotic changes, retinopathies, nephropathies and cardiac complications. Early diagnosis and diet modifications are usually enough for preventing and treating hypertriglyceridemia in diabetes mellitus. Exercise is strongly recommended as it not only reduces the serum lipids level but also potentates the effect of diet or drug therapy of glucose metabolism in diabetic patients. Strict diet modification, control of blood pressure, avoidance of smoking and control of over weight and obesity. we strongly recommend "Lipid and diabetes awareness programme" for our population.

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