

DIABETES MELLITUS TYPE 2;

Pattern of dyslipidemias

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ABSTRACT.....Objective: The objective of this study is to determine the pattern dyslipidemia in patients of Type 2 diabetes mellitus. **Study Design:** Cross-sectional study. **Place and Duration:** This study was carried out in General Medicine department of Peoples Medical University & Hospital Nawabshah and Civil Hospital Karachi, from June 2011 to July 2012. **Methodology:** This study consisted of seventy patients. Detailed history was taken from all the patients with special regard to increased thirst and frequent urination, increased hunger, weight loss, fatigue, blurred vision, slow-healing sores or frequent infections and an areas of darkened skin. Inclusion criteria were that all patients after counseling for study and taking written consent were included in this study >35 years of age with either sex admitted in general medicine ward through outpatient department and diagnosed as case of DM type 2 on the basis of history , clinical examination and investigations. Exclusion criteria included patients on dialysis, patients on lipid lowering agents, patients with acute complication of diabetes mellitus such as diabetic keto-acidosis, patients suffering from hypothyroidism, nephritic syndrome, type 1 DM and HTN, lactic-acidosis and hypoglycemia. Results were prepared with the help of tables and graphs. Data was analyzed through SPSS software. **Results:** Out of 70 patients included in this study 46 were men (65.8%) and 24 patients were female (34.2%); with male to female ratio of 1.9:1. There was wide variation of age ranging from a minimum of 35 year to 75 year. The mean age was 48.65 ± 7.8 years. Mean total serum cholesterol was 196.04 ± 44.02 mg/dl, mean serum triglycerides was 193.04 ± 108.64 mg/dl , mean high density lipoprotein 29.28 ± 8.48 mg/dl, mean low density lipoprotein 125.24 ± 39.68 mg/dl and mean very low density lipoprotein was 31.28 ± 8.48 mg/dl. Total cholesterol was abnormal (>200mg/dl) in 56(80%) patients out of 70[21(87.5%) were females and 35 (76.1%) were males], Triglycerides was abnormal (>150mg/dl) in 62(88.5%) patients [22 (91.66 %) were females and 40 (86.95%) were males], high density lipoprotein was abnormal (< 35 mg/dl) in 51(72.8%) patients[18(75%) were females and 33(71.73%) were males], LDL was abnormal (>130 mg/dl) in 40(57.1%) patients [17 (70.83%) were females and 23(50%) were males] and VLDL was abnormal (> 30 mg/dl) in 47(67.14%) patients [19(79.16%) were females and 28(60.86%) were males]. **Conclusions:** We conclude that dyslipidemia is common among type 2 diabetic patients. Males are more prone to suffer from this complication. Patterns of dyslipidemia found more commonly were decreased HDL levels, increased LDL and Triglycerides levels. There is a need for early detection and treatment of this problem to prevent type 2 diabetic complications .

Key words: Dyslipidimia ,Type 2 diabetes mellitus.

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INTRODUCTION

Diabetes mellitus type 2 is heterogeneous condition characterized by presence of both impaired insulin secretion and insulin resistance, It has unfortunately reached epidemic proportion now-a-days¹. Diabetes mellitus type 2 is a leading cause of death and disability in both developed and developing countries². A study conducted in 2000 and reported that worldwide Diabetes mellitus type 2 estimated prevalence of 2.8% will rise to 4.4% by 2030³. In Pakistan there are 5.2 million cases in the year of 2000 and it is estimated to be 13.9 million in 2030⁴.

Diabetic mellitus is independent risk factor for vascular disease, abnormalities in insulin and glucose do not seems to account entirely for high frequency of microvascular or macrovascular disease in patients with Diabetes mellitus type 2. In UK prospective Diabetic study (UKPDS) the typical lipid pattern in the population with DM compared with non DM showed a pattern of hypertiglyceridemia, low HDL-C, relatively unaltered total cholesterol and an increase LDL-C⁵.

Athrogenic Dyslipidimia also known as Diabetic dyslipidimia is characterized by elevated very-low-density lipoprotein (VLDL), small dense LDL particle

and low high density lipoprotein (HDL) cholesterol. Increased concentration of LDL cholesterol may be more pathogenic. In patients with Diabetes mellitus type 2 than in non DM, because of presence of small dense low density lipoprotein cholesterol particle oxidation glycated LDL-C. It was found that prevalence of dyslipidemia in DM subject has high risk of total cholesterol 56.6, triglyceride 23.6, LDL-C 77.1 and HDL-C 48.9% respectively⁶. HDL has protective role against atherosclerosis because of its role in reverse cholesterol transport, metabolism of TG and lipoprotein. Since it is reservoir of apoprotein C-2 which is the activator of lipoprotein lipase the enzyme responsible for the metabolism of chylomicron and VLDL in peripheral tissue⁷. Diabetic related changes in plasma lipid level are among the key factors that are amenable to intervention⁸.

MATERIAL AND METHODS

This study consisted of seventy patients was carried out in General Medicine department of Peoples Medical University & Hospital Nawabshah and Civil hospital Karachi from June 2011 to July 2012. Detailed History was taken from all the patients with special regard to increased thirst and frequent urination, increased hunger, weight loss, fatigue, blurred vision, slow-healing sores or frequent infections and an areas of darkened skin. All patients underwent for base line and specific investigations especially fasting blood sugar and fasting lipid profile. Inclusion criteria were that all patients after counseling for study and taking written consent were included in this study > 35 years of age with either sex admitted in general medicine ward through outpatient department and diagnosed as case of DM type 2 on the basis of history, clinical examination and investigations. Exclusion criteria included patients on dialysis, patients on lipid lowering agents, patients with acute complication of diabetes mellitus such as diabetic keto-acidosis, patients suffering from hypothyroidism, nephritic syndrome, type 1 DM and HTN, lactic-acidosis and hypoglycemia.

RESULTS

Out of 70 patients included in this study 46 were men (65.8%) and 24 patients were female (34.2%); with male to female ratio of 1.9:1. There was wide variation of age ranging from a minimum of 35 year to 75 year. The mean age was 48.65 ± 7.8 years. Patient's lipid profile mean total serum cholesterol was 196.04 ± 44.02mg/dl, mean serum triglycerides was 193.04 ± 108.64 mg/dl, mean high density lipoprotein 29.28 ± 8.48mg/dl, mean low density lipoprotein 125.24 ± 39.68mg/dl and mean very low density lipoprotein was 31.28 ± 8.48 mg/dl (Table-I).

Pattern of dyslipidemias in gender. Total cholesterol was abnormal (>200mg/dl) in 56(80%) patients out of 70[21(87.5%) were females and 35 (76.1%) were males], Triglycerides was abnormal (>150mg/dl) in 62(88.5%) patients [22 (91.66 %) were females and 40 (86.95%) were males], high density lipoprotein was abnormal (<35 mg/dl) in 51(72.8%) patients[18(75%) were females and 33(71.73%) were males], LDL was abnormal (>130 mg/dl) in 40(57.1%) patients [17 (70.83%) were females and 23(50%) were males] and VLDL was abnormal (>30 mg/dl) in 47(67.14%) patients [19(79.16%) were females and 28(60.86%) were males] (Table-II).

Lipid profile	Mean ± SD
S-Cholesterol	196.04 ± 44.02 mg/dl
S-Triglycerides	193.04 ± 108.64 mg/dl
HDL-Cholesterol	29.28 ± 8.48 mg/dl
LDL-Cholesterol	125.24 ± 39.68 mg/dl
VLDL-Cholesterol	31.28 ± 8.48 mg/dl

Table-I. Lipid profile

DISCUSSION

Worldwide large number of people affect type 2 diabetes mellitus and its prevalence is increasing

Pattern of fasting lipid profile	Test results	Sex			
		Male (n=46)		Female (n=24)	
		35-55 years	56-75 years	35-55 years	56-75 years
S-Cholesterol	>200mg/dl	24 patients	11 patients	17 patients	4 patients
S-Triglycerides	>150mg/dl	32 patients	8 patients	11 patients	11 patients
HDL-Cholesterol	<35mg/dl	20 patients	13 patients	8 patients	10 patients
LDL-Cholesterol	>130mg/dl	19 patients	4 patients	9 patients	8 patients
VLDL-Cholesterol	>30mg/dl	21patients	7 patients	6 patients	13 patients

Table-II. Distribution & pattern of fasting lipid profile according to sex (n=70)

quickly⁹. In Pakistan; 6.9 million people are suffering from diabetes, with the International Diabetes Federation estimating that this number will grow to 11.5 million by 2025. In 2007, 246 million people worldwide suffered from diabetes making the disease one of the most common non communicable global diseases and the 4th leading cause of death in the world¹⁰. In diabetic patients mainly women, increased cardiovascular mortality has been observed. Epidemiological data reported that 70% of patients with type 2 diabetes will die of some form of cardiovascular problems¹¹.

In our study overall male patients were more dyslipidemic as compared to female. Out of 70 patients 46 were men (65.8%) and 24 patients were female (34.2%); with male to female ratio of 1.9:1. However in the study of Jali MV¹² reported the prevalence of dyslipidemia was higher among males (58.6%) compared to females (41.4%). However the male to female ratio given by Ogbe PJ¹³ was 1.6:1.

The age ranged from 35 to 75 years with mean age of 48.65±7.8 years. The peak age group in our study were 4th and 5th decade of life which is comparable to other study where peak incidence was in the 5th decade of life and also reported prevalence of dyslipidemia increases as the age advances among

males¹². The prevalence was 80% among > 50 years which was significantly higher compared to other age groups¹².

In our study the lipid profile, mean total serum cholesterol was 196.04 ± 44.02mg/dl, mean serum triglycerides was 193.04 ± 108.64 mg/dl, mean high density lipoprotein 29.28 ± 8.48mg/dl, mean low density lipoprotein 125.24 ± 39.68mg/dl and mean very low density lipoprotein was 31.28 ± 8.48 mg/d. This is also favored by other local and international studies^{14,15}.

Pattern of dyslipidemias are due to resistance to insulin and hyperglycemia which are decreased high density lipoprotein and elevated triglycerides¹⁶. In the study of Shera A¹⁷ was observed that uncontrolled diabetes will lead to higher vascular (macro and micro) complications and was related to longer duration of diabetes, poor control, increased weight and high blood pressure. The vascular complications were ischemic heart disease, myocardial infarction and cerebrovascular accident. In our study revealed that pattern of dyslipidemias were total cholesterol abnormal (>200mg/dl) in 56(80%) patients out of 70, triglycerides abnormal (>150mg/dl) in 62(88.5%) patients, high density lipoprotein abnormal (<35mg/dl) in 51(72.8%) patients, LDL abnormal (>

130 mg/dl) in 40(57.1%) patients and VLDL abnormal (> 30 mg/dl) in 47(67.14%) patients. While in study of Jali MV reported the prevalence of isolated hypercholesterolaemia; males (63.4%), females (36.6%), isolated hypertriglyceridaemia; males (58.9%), females (41.1%), isolated high LDL; males (56.7%), females (43.3%) and isolated low HDL; males (52.7%), females (47.3%) was found. Prevalence of fasting isolated abnormal lipid parameters was significantly higher among males with diabetes.

In our study observed the evidence for the presence of high prevalence of dyslipidemia in type 2 diabetic patients. Although our patients received oral hypoglycemic agents for hyperglycemia and in some cases were treated with lipid lowering agents, a significant proportion of them had abnormal lipid profile. The most frequent was hypertriglyceridemia 62(88.5%) patients and frequent was elevated total cholesterol 56(80%) patients.

Fontbonne et al. in a prospective cohort study showed that elevated plasma levels of TG in diabetic patients was positively and significantly correlated with CAD events and CAD mortality¹⁸. Hypertriglyceridemia may be the best lipid predictor of CVD in type 2 diabetic patients¹⁸. Recent studies have demonstrated that in diabetic patients TG levels is a risk factor for CVD independent of HDL-C level and despite glycemic control^{19,20}.

CONCLUSIONS

Dyslipidemia is common among type 2 diabetic patients. Males are more prone to suffer from this complication. Patterns of dyslipidemia found more commonly were decreased HDL levels, increased LDL and Triglycerides levels. These problems need attention and take efforts for screening, treatment and life style modification would facilitate in decreased complications, CVD morbidity and mortality in type 2 diabetes dyslipidemic pattern patients.

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