FREQUENCY OF DYSLIPIDEMIAS IN DIABETIC PATIENTS AT COMBINED MILITARY HOSPITAL MULTAN

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ABSTRACT

Objective: To determine the frequency of dyslipdemias in diabetic patients at Combined Military Hospital Multan.

Study Design: Cross sectional observational

Place and Duration of Study: Department of Medicine, Combined Military Hospital Multan from February 2007 to August 2007.

Patients and Methods: Diabetic patients aged between 30-70 years of either gender and having diabeties for >5years were included in the study. Patients with co-existant hypothyroidism, chronic renal failure, nephrotic syndrome, familial hypercholesteremic syndromes, already on lipid lowering drugs, anti-hypertensive drugs, using beta blockers or thiazide diuretics, obese patients with BMI > 30 and those using alcohol were excluded. Blood samples after overnight 10 hours fasting were taken for plasma glucose, serum total cholesterol, HDL-cholesterol, LDL-cholesterol and triglycerides. Frequency of dylipideamias was analysed using Statistical Package for Social Sciences (SPSS) version 10.

Results: Mean age of 200 diabetic patients included in the study was 51±9.47 years (range 34-70 years) and male to female ratio of 1.2:1. Mean fasting plasma glucose levels of the diabetic patients was 8.2 ±2.2 mmol/L. Out of 200 patients, dyslipideamia was present in 163(81.5%) patients. Hypertriglyceridemia was present in 150(75%) patients, raised LDL-cholesterol in 126 (63%) patients, decreased HDL-cholesterol in 119 (59.5%) patients, and raised levels of total cholesterol in 89 (44.5%) of the patients.

Conclusion: Diabetic patients have a high frequency of dyslipidemias especially raised triglycerides, therefore lipid profile is to be checked routinely and its management be given equal importance in addition to glycemic control.

Keywords: Diabetes mellitus, Dyslipideamia, Glucose

INTRODUCTION

Diabetes mellitus (DM) is the most common endocrine disorder and a major cause of mortality and morbidity worldwide. It is estimated that about forty million people worldwide are suffering from this disease. DM has strong association with dyslipidemias in relation to glycemic control and duration of the disease[1,2]. Dyslipidemias make diabetic patients 2-4 times more susceptible to coronary artery disease (CAD) which is the major cause of increased mortality and morbidity in these patients[3]. Among various dyslipidemias in diabetics the most common is hypertriglyceridemia followed by decrease levels of serum HDL-cholesterol, raised serum LDL-cholesterol and lastly increased serum cholesterol levels[4]. Impaired action of insulin in diabetic patients increases the rate of intracellular hydrolysis of triglyceride(TG) with the release of nonesterified fatty acids (NEFA) which act as substrate for liver. Impaired insulin action and relative insulin deficiency causes complex alterations in plasma lipids resulting in raised plasma very low density lipoprotein (VLDL) levels and decreased serum HDL-cholesterol levels both causing increased rate of atherosclerosis and hence contributing to CAD.[5] Early diagnosis, good glycemic control and dietary modifications are primary prevention to avoid hypertriglyceridemia in DM. Exercise not only reduces the serum lipid levels but also potentiates the effects of diet and drug therapy of glucose metabolism in diabetic patients[6]. Fibric acid derivatives, such as fenofibrate, bezafibrate and gemfibrozil, are preferred in the treatment of dyslipidemias

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associated with DM and metabolic syndrome than HMG-CoA reductase inhibitors as they are usually more effective for normalizing serum levels of HDL-Cholesterol and TG[7].

Pakistan with a population of approximately 150 million has a high prevalence of diabetes as 12% in people above 25 years of age, 10% having impaired glucose tolerance with institutions specializing in diabetes care limited in number[8]. Considering DM as a common disease in our population and associated dyslipidemias an important risk factor for coronary artery disease, which can be overlooked and resultantly under treated, this study was undertaken to determine the frequency of dyslipideamias in diabetic patients so as to prime the treating clinicians of this important risk factor and to formulate treatment guidelines for the prevention of CAD in diabetic patients.

PATIENTS AND METHODS:

This cross sectional study was carried out at the Department of Medicine, Combined Military Hospital Multan from February 2007 to Aug 2007. Patients coming to the medical outpatient department were included in the study according to the inclusion criteria. Diabetic patient aged between 30-70 years of either gender and having diabetes for >5years were included after obtaining informed consent. However patients with co-existant hypothyroidism, chronic renal failure, nephritic syndrome, familial hypercholesteremic syndromes, already on lipid lowering drugs, anti-hypertensive drugs using beta blockers or thiazide diuretics, obese patients with BMI > 30 and those using alcohol were excluded from the study. Non-probability consecutive convenience sampling was done after taking history and clinical examination. Patients were advised to give a blood sample after overnight 10 hours fasting at the pathology laboratory of the hospital on the next day. Venous blood sampling was done and 3ml of blood was collected in Na+ fluoride bottle for plasma glucose and another 3ml of blood was collected in plain tubes for serum lipids. Both the samples were centrifuged. The samples were then analysed for fasting plasma glucose and serum lipid profile including HDL- cholesterol, LDL-cholesterol, serum TG and serum total cholesterol. The patient information and the serum levels were endorsed in a pre-designed clinical proforma.

The data was entered and analysed using SPSS 11.0. Descriptive statistics were used for the data i.e qualitative variables like gender and dislipidemias were presented with frequencies and percentages while quantitative variables like age, weight, height, lipid profile and plasma glucose levels were presented with means and standard deviations (SD).

RESULTS

Total 200 patients were included in the study with a mean age of 51±9.47 years, age range of 34-70years and male to female ratio of 1.2:1. Mean weight of diabetic patients was 60.9 ±5.8 kg with a mean height of 164.6 ±7.7 centimeters. The mean fasting plasma glucose levels of the diabetic patients was 8.2 ±2.2 mmol/L.

Out of 200 diabetic patients dyslipidemia was seen in 163(81.5%). Mean serum TG levels were 2.8 ±0.7mmol/L while it was raised in 150(75%) patients (reference range 0.4-2.3mmol/L). Similarly mean serum LDL-cholesterol was 3.6±0.5mmol/L and was raised in 126(63%) patients (reference range <3.4mmol/L). However, mean serum HDL-cholesterol was 0.9 ±0.1 mmol/L and was below the normal reference range (>0.9mmol/L) in 119(59.5%) patients. Mean serum total cholesterol was 5.2±0.8mmol/l and was above the reference range (<5.2mmol/L) in 89(44.5%) patients (table).

DISCUSSION

DM is the commonest endocrine syndrome which is characterized by hyperglycemia due to relative or absolute deficiency of insulin. Diabetes has got a worldwide distribution and over the time there is increase in its incidence which is expected to reach by around 340 million by year 2030. The

diagnosis of DM is established with fasting plasma glucose ≥ 7.0 mmol/l (126 mg/dl) or random plasma glucose ≥ 11.1 mmol/l (200 mg/dl). In asymptomatic patients two samples are required to confirm diagnosis[9].

Diabetes is associated with both short and long term complications which are the cause of increased mortality and morbidity among which diabetic dyslipidemias are very important[9]. DM is a coronary heart disease equivalent because diabetic dyslipidemias make these patients 2-4 times more prone to CAD as compared to normal population[3]. However, the various dyslipidemias prevalent in diabetics differ in their frequency.

A lot of work has been done internationally on diabetic dyslipidemias. Elnasri et al compared the frequency of various dyslipidemias in diabetics and age, sex matched healthy controls in Sudan and found an increased incidence of various dyslipimedias in diabetics as compared to controls with particularly statistically significant increase in triglyceride levels and a decrease in HDL-cholesterol levels[10]. Other studies also showed a high prevalence of dyslipidemias in diabetics[11,12].

Ahmed et al did a comparative cross sectional study on 50 type-1 and 50 type-2 diabetics and found a high frequency of dyslipidemias in both groups .Other local studies have also shown that dyslipidemias are very common in diabetic population[13,14].

International studies done show that among the diabetic dyslipidemias, hypertriglyceridemia is the commonest[4,10]. Mathura et al found increased serum triglyceride levels around 73.3% as the most common lipid abnormality in DM followed by decreased serum HDL-cholesterol and increased serum LDL-cholesterol seen in 66.7% patients each. A raised serum total cholesterol level is seen in 46.7% patients[4]. This frequency is comparable to that seen in our study as well.

Studies done in local population although have shown increased incidence of dyslipidemias but there are conflicting results regarding the relative frequency of various dyslipidemimas[15,16] Khalil et al[14] found that hypertriglyceridemia was the predominant type of dyslipidemia present in 56.66% patients followed by low HDL-cholesterol in 52.50% patients, while Firdous et al[17] showed low HDL- cholesterol as the commonest dyslipidaemia followed by high LDL-cholesterol, serum cholesterol and TG levels respectively.

This study was done to determine the frequency of dyslipidemias in local population belonging to Multan and surroundings. The results showed a high prevalence of dyslipidemia (81.5%) with hypertriglyceridemia (75%) as the commonest followed by raised LDL-cholesterol levels (63%), decreased HDL-cholesterol levels (59.5%) and raised serum total cholesterol levels (44.5%). These findings were in consonance with other studies done internationally[4,10] and locally[14-16] while few local studies[17] have shown the relative frequency of dyslipidemias different from this study.

The high frequency of dyslipidemias in our study are related probably to poor glycemic control in our patients as dyslipidemias are proportional to the glycemic control as is shown in few international studies.[12]

The present study had its own limitations. Firstly, it was carried out on a small proportion of selected patients belonging specifically to Multan and patients were either serving or retired armed forces personnel. Moreover, glyceamic index was not determined in our study population to correlate the association of glyceamic control with dyslipideamias. However, despite its shortcomings, the strength of the study is that there was significant proportion of diabetic patients who had dyslipidemias with hypertriglyceridemia being the commonest. Therefore, timely diagnosis and treatment of dyslipidemias is crucial in managing diabetic patients and for subsequent development of atheroscelrosis leading to CAD.

CONCLUSIONS

Frequency of dyslipidemias in diabetics is reasonably high with hypertriglyceridemia

being the most common. Appropriate therapeutic interventions should be carried out in diabetics to treat dyslipidemias to avoid risk of cardiovascular complications thereby reducing mortality and morbidity in these patients.

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Table: Description of normal lipid profile with dyslipideamia in diabetic patients (n=200).

Serum lipid profile	Mean	Lipid profile in diabetic patients (n=200)	
		Normal	Abnormal
Serum Triglyceride (0.4-2.3mmol/L)	2.8 ±0.7mmol/L	50	150
Serum LDL-Cholesterol (<3.4mmol/L)	3.6±0.5mmol/L	74	126
Serum HDL-Cholesterol (>0.9mmol/L)	0.9 ±0.1 mmol/L	81	119
Serum Cholesterol (<5.2mmol/L)	5.2±0.8mmol/L	111	89

LDL: Low density lipoprotein

HDL: High density lipo-protein