Pattern of Dyslipidemia in Type 2 Diabetes Mellitus in Jammu Region

ABSTRACT

Aim The most common complications of diabetes mellitus are peripheral neuropathy, nephropathy, retinopathy, coronary artery disease and cerebrovascular disease. Diabetic dyslipidemia usually includes elevated triglycerides (TG), elevated low-density lipoproteins (LDL) and decreased high-density lipoproteins (HDL) levels. The objective of the study was to investigate the pattern of dyslipidemia patients of type 2 diabetes mellitus (T2DM) attending Sub District Hospital Hiranagar, District Kathua, Jammu & Kashmir State.

Materials and Methods A cross-sectional study was conducted during 3 months period from September 2017 to November 2017, with the patients of type 1 diabetes mellitus, coronary heart disease and those on lipid-lowering drugs excluded from the study. The demographic parameters (age, gender) of the patients were recorded. Fasting blood samples of the patients were taken to measure serum lipid profile parameters.

Results Out of 500 patients of T2DM, 209 were males and 291 were females. The mean age of the study population was 53.5 ± 12.0 years, with the mean duration of diabetes since diagnosis being 5.2 ± 3.34 years. Out of the total, 55.6% (278) were having high serum triglyceride and an even higher no of patients 60.4% (302) were having raised LDL-cholesterol levels.

Conclusion There is an increasing trend of diabetes and dyslipidemia in rural population with a relatively high prevalence amongst rural women and distributed equally amongst all age groups. It is advisable to go for aggressive lifestyle changes followed by medication with lipid-lowering drug. The optimal care of diabetic patients should include regular monitoring of blood sugar and full range serum lipid profile.

KEYWORDS type 2 diabetes mellitus, lipid profile, dyslipidemia

INTRODUCTION

Dyslipidemia is one of the major risk factors for cardiovascular disease in diabetes mellitus. Early detection and treatment of dyslipidemia in type 2 diabetes mellitus (T2DM) can prevent risk for atherogenic cardiovascular disorder. All forms of diabetes are characterized by absolute or relative deficiencies in insulin secretion and/or insulin action associated with chronic hyperglycemia and disturbances of carbohydrate, lipid and protein metabolism. The lipid abnormalities are prevalent in diabetes mellitus because insulin resistance or deficiency affects key enzymes and pathways in lipid metabolism. In particular, the following processes are affected: apoprotein production, regulation of lipoprotein lipase, action of cholesterol ester, transfer proteins and hepatic and peripheral actions of insulin. Even more, it has been proposed that the composition of lipid particles in diabetic dyslipidemia is more atherogenic than other types of dyslipidemia.

The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels. Diabetes has evolved into an epidemic in India. The estimated number of patients in India with diabetes was 62.4 million in 2011, which is protected to a rise in staggering 101.2 million by 2030. Diabetes mellitus a heterogeneous group of metabolic disorder and it is characterized by hyperglycemia resulting from defect in insulin secretion, insulin action or both. Insulin resistance, relative insulin deficiency and obesity are found to be associated with hypertriglyceridemia. Low serum HDL cholesterol and occasionally high serum LDL cholesterol is associated with T2DM. Dyslipidemia is commonly seen in diabetes and it manifests as raised cholesterol and at times triglycerides and HDL levels.
low-density lipoprotein cholesterol (LDL-C), decreased high-density lipoprotein cholesterol (HDL-C) levels, or elevated triglyceride (TG) levels. Hypertriglyceridemia is an independent risk factor for coronary heart disease. It is well established that dyslipidemia is a major risk factor for macrovascular complications in patients of T2DM and affects 10–73% of this population. The third report of the expert panel on detection, evaluation and treatment of high blood cholesterol in adults (adult treatment panel III or ATP III) has reported diabetes mellitus as the equivalent of coronary heart disease (CHD), elevating it to be the highest category. There are very few data available for prevalence of dyslipidemia in diabetes from Indian continent, which are mainly from south Indian population and few from north Indian population.

MATERIALS AND METHODS

This cross-sectional study was carried on the patients attending the Medicine OPD of Sub-District Hospital, Hiranagar, Jammu during 3 months period from September 2017 to November 2017. The patients of T2DM visiting consecutively in the OPD medical were considered for this study. The patients included in this study were already diagnosed with T2DM taking treatment and newly diagnosed T2DM patients. The patients of Type 1 DM, those who are suffering from coronary heart disease or had history of cerebrovascular accident and those patients already taking statins or lipid-lowering drugs were excluded from this study. Detailed history was taken and clinical examination was done in the patients included in this study. The demographic parameters (age, gender) of the patients were recorded and their weight and height were recorded using standard methods. Fasting blood sample of the patients was taken after at least 8-h overnight fast to measure serum lipid profile parameter of total cholesterol (TC), TG, LDL-C and HDL-C. The cut-off normal values for individual lipid levels were taken as per guidelines of the National Cholesterol Education Program Expert panel on detection evaluation and treatment of high blood cholesterol in adults. The body mass index (BMI) was calculated by the Quetelet index, BMI = weight (kg)/height (m²) from weight and height measurement.

RESULTS

Out of 500 patients of T2DM eligible for this study, 209 were males and 291 were females. The mean age of the study population was 53.5 ± 12.0 years, with male being 52.5 years and females being 53.9 years. The mean duration of diabetes since diagnosis amongst all was 5.2 ± 3.34 years. About 38.8% (194) of patients were diagnosed with diabetes for last 2–5 years and 29.6% (148) patients were diagnosed to be diabetic for the last 5–10 years, 24.4% were diagnosed to be diabetic in the last 2 years, while only 7.2% patients were diabetic for >10 years. The mean BMI of the patients studied was 27.1 (males: 26.2 and females: 28.6). The BMI was ≥25 in 67.6% patients and <25 in 33.4% patients. Dyslipidemia among patients aged <45 years was 80.8%, for age group 45–60 years, it was 80.1% and for >60 years, it was 82.7%, differences not being statistically significant (P = 0.977). Out of the total 500 diabetic patients studied, 181 (36.2%) were having high serum CT, 278 (55.6%) were having high serum TG, even higher no of patients (302) were having raised LDL-C levels 302(60.4%) and 175 (35%) patients had deranged HDL-C levels.

The characteristics of the patients and the prevalence of dyslipidemia are shown in Table 1.

Overall 81% of diabetic patients were having dyslipidemia and amongst them, the mean serum lipid values are shown in Table 2.

DISCUSSION

Dyslipidemia in diabetics commonly manifests as raised LDL-C and decreased level of HDL-C or an elevated
TG levels. The present study shows a high prevalence of dyslipidemia (81%) in diabetics with most of the patients showing more than one lipid abnormality. Mixed dyslipidemia observed was mainly: raised LDL levels (60.4%) and TG levels (55.6%). These two abnormalities pose great risk for CAD in T2DM. Furthermore, data from the United Kingdom prospective diabetes study suggest that both decreased LDL-C and elevated LDL-C predict coronary heart disease (CHD) in diabetics. The burden of diabetes and dyslipidemia is mainly borne by the urban population in India, but as shown through the present study, there is an increasing trend of diabetes and dyslipidemia in rural population also, which is very alarming. Besides, a relatively high prevalence amongst rural women 291 (58.2%) is also a significant revelation, which shows the recent trend of this disease which is basically considered a lifestyle disease. Another important finding is about the prevalence of dyslipidemia amongst the various age groups. Their rates are quite similar for all age groups, scaling more than 80% for diabetics for all ages. Dyslipidemia management in people with diabetes mellitus, just like in any other individual, starts with a thorough evaluation that aims to identify secondary causes that might contribute to the abnormal lipid profile.

Dyslipidemia is a hugely studied problem amongst all populations of the world. It is a high-risk abnormality, but modifiable with the change of life style. Its increasing prevalence among diabetics is raising the challenge bar. It is now almost mandatory to monitor the complete lipid profile of a diabetic patient for an aggressive cardiovascular preventive management. It is advisable to go for complete lipid profile of diabetic patients than an individual lipid fraction level test and a lipid-lowering treatment should be initiated early in the treatment.

CONCLUSION
This study shows the high prevalence of dyslipidemia in diabetic patients. The patients have a higher prevalence of high serum cholesterol, high TGs, LDL-C and low HDL cholesterol. The optimal care of diabetic patients should include routine monitoring of blood sugar and serum lipid profile. Aggressive lifestyle changes, such as weight reduction and physical exercise should be initiated first followed by medication with lipid-lowering drug. Sometimes one or another lipid level is found to be abnormal, suggesting that whole lipid profile must be evaluated at regular intervals.

REFERENCES