ORIGINAL ARTICLE

Lipid Profile and Mortality Risk in Elderly Type 2 Diabetic Patients

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ABSTRACT:

Background: To evaluate the lipid profile and mortality risk in type 2 diabetes elder patients. **Materials & methods:** A total of 150 subjects were enrolled. The subjects were taken in two groups according to age as 55-70 years and above 70 years. The cholesterol-HDL ratio and LDL-cholesterol were positively related to both all-cause and cardiovascular mortality in the low age group. The triglyceride levels were calculated. The chi-square test was done. The results were analysed using SPSS software. **Results:** Diastolic blood pressure, BMI, total cholesterol and level of triglycerides were lower in the high age group, whilst HDL-cholesterol and serum creatinine were higher. The BMI calculated for above 70 years was 28.2 kg/m^2. The 8% in group II received lipid- lowering treatment. **Conclusion:** High lipid levels were related to increased cardiovascular mortality with diabetes.

Keywords: type 2 diabetes, lipid profile, elder.

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INTRODUCTION

Type 2 diabetes mellitus (T2DM) and dyslipidemia are important risk factors for cardiovascular disease.[1,2] Randomized controlled trials have clearly demonstrated the positive effects of lipid-lowering treatment (LLT) in T2DM, as shown in two recent meta-analyses.[3,4] Therefore, treatment with lipid-lowering drugs is recommended for virtually all patients with T2DM in the various guidelines. [5,6] Although part of these studies included patients older than 75 years, no separate analyses were performed for this age group. The only randomized controlled trial specifically designed for the elderly (70–82 years) showed a reduction in cardiovascular disease risk.[7] This reduction was largely attributable to positive effects in the secondary prevention group, as shown in a post-hoc analysis. The risk of cardiovascular disease was not reduced in patients with a history of diabetes, although the number of patients with diabetes was probably too small to permit accurate interpretation of the treatment effect. [7] The risk factors for CAD include hypertension, dyslipidemia, obesity, and smoking. [8,9] Therefore, prioritizing and managing diabetic patients with CVD risk factors is extremely important. In dyslipidemia, serum low-density lipoprotein cholesterol (LDL-C) appears to have the greatest role in premature and early atherosclerosis and CAD development and must therefore be treated as aggressively as hyperglycemia to reduce CAD risk. In fact, improved control of LDL-C can reduce cardiovascular complications by 20% to 50%. [10]

Type 2 diabetic patients have markedly increased risk of coronary heart disease than similarly dyslipidaemic non diabetic subjects.[11] Low HDL and HDL2

cholesterol, high VLDL cholesterol, and high total and VLDL triglycerides are powerful risk indicators for coronary heart disease events in patients with type 2 diabetes mellitus.[12,13] Most recently, results of the Strong Heart Study indicate that LDL cholesterol is an independent predictor of cardiovascular disease in patients with diabetes, along with age, albuminuria, fibrinogen, HDL cholesterol (inverse predictor), and percent body fat (inverse predictor).[14] Atherogenic dyslipidaemia (diabetic dyslipidaemia) is characterized by 3 lipoprotein abnormalities: elevated very-low-density lipoproteins (VLDL), small LDL particles, and low high-density-lipoprotein (HDL) cholesterol (the lipid triad). [15] Hence, this study was conducted to evaluate the lipid profile and mortality risk in type 2 diabetes elder patients.

MATERIALS & METHODS

A total of 150 subjects were enrolled. The subjects were taken in two groups according to age as 55-70 years and above 70 years. The data was collected. All lipid profile indices were calculated after a median follow-up of 10 years. The cholesterol-HDL ratio and LDL-cholesterol were positively related to both all-cause and cardiovascular mortality in the low age group. The triglyceride levels were calculated. The chi-square test was done. The results were analysed using SPSS software.

RESULTS

A total of 150 subjects were enrolled. Diastolic blood pressure, BMI, total cholesterol and level of triglycerides were lower in the high age group, whilst HDL-cholesterol and serum creatinine were higher. Also, diabetes duration was longer and complications

were more prevalent. The mortality risk decreased by 15% for each 1 mmol/L higher serum level of triglycerides.The BMI calculated for above 70 years was 28.2 kg/m^2. The 8% in group II received lipid-lowering treatment.

Table 1: basic parameters

Parameters	55-70 years (n= 100)	>70 years (n= 50)	P - value
Age (years)	66	80	-
Duration of T2DM	5	10	0.001
BMI (kg/m^2)	30	28.2	<0.001
Systolic blood pressure (mm Hg)	160.2	156.4	0.3
Diastolic blood pressure (mm Hg)	86.2	80.4	<0.001
Cholesterol- HDL ratio	5.2	4.9	0.001
Triglycerides (mmol/L)	2.8	2.2	<0.001
Receiving lipid-lowering treatment	18 (18)	4 (8)	<0.001
Serum creatinine (umol/L)	90	98	<0.001

DISCUSSION

Diabetic dyslipidemia is characterized by elevated triglycerides, decreased high-density lipoprotein cholesterol (HDL-C), and elevated LDL-C in comparison with patients without diabetes. HDL-C is responsible for removing excess cholesterol from the peripheral tissues. [16,17] Therefore, when HDL-C is decreased, triglycerides, very low-density lipoprotein cholesterol (VLDL-C), and LDL-C levels will all be elevated. Hence, this study was conducted to evaluate the lipid profile and mortality risk in type 2 diabetes elder patients.

In the present study, a total of 150 subjects were enrolled. Diastolic blood pressure, BMI, total cholesterol and level of triglycerides were lower in the high age group, whilst HDL-cholesterol and serum creatinine were higher. A study by van Hateren KJ et al, studied 881 primary care patients with T2DM aged 60 years and older participated in the ZODIAC study. The cohort was divided into two age categories: 60–75 years and older than 75 years. Updated means of all lipid profile indices were calculated after a median follow-up time of 9.8 years. The cholesterol-HDL ratio and LDL-cholesterol were positively related to both all-cause and cardiovascular mortality in the low age group. In contrast, except for the triglyceride level, none of the other lipid profile indices were related to all-cause mortality in patients aged over 75 years. The mortality risk decreased by 17% (95%CI: 5% to 27%) for each 1 mmol/L higher serum level of triglycerides. The relationships between the various lipid profile indices and cardiovascular mortality were not significant. Although the lipid profile was not predictive in the overall group of elderly patients, higher lipids were related to increased cardiovascular mortality in patients with diabetes of long duration.[18]

In the present study, the mortality risk decreased by 15% for each 1 mmol/L higher serum level of triglycerides. The BMI calculated for above 70 years was 28.2 kg/m^2. The 8% in group II received lipid-lowering treatment. Another study by Mohamed E et al, studied Type 2 diabetic patients with high, borderline, and low risk LDL cholesterol level were 62 %, 25 %, and 10 %, respectively. There were 26 % patients in the high risk HDL cholesterol group, 31 % were in the borderline risk group, and 43 % were in the low risk group. Only 3 % and 25 % of patients had triglycerides concentration in the high and borderline risk categories, respectively, but 72 % had low risk triglycerides levels. More female and younger subjects than men and older subjects had HDL cholesterol in high and borderline risk categories. The percentages of patients with triglycerides values at high and borderline high risk category were higher in poor and acceptable glycaemic control groups than good glycaemic control group. The most prevalent dyslipidaemia pattern was an isolated LDL cholesterol increase, which was observed in 35 % of the patients. The second most common pattern of dyslipidaemia was a combination of LDL cholesterol above goal with HDL cholesterol below target, which was observed in 30 % patients. Patients with established dyslipidaemia will require advice regarding diet, exercise and improvement in glycaemic control. [19]Despite the high and widespread prevalence of dyslipidaemia among people with and without diabetes, only 2.2 % of adults without diabetes and 32 % of diabetic patients were receiving treatment with diet, exercise, or drugs to reduce lipid levels and less than one third of patients with established cardiovascular disease received such treatment.[20,21] The optimal goal for LDL cholesterol is 2.6 mmol/L (100 mg/dl). When using this clinical end point, a substantial percentage (91 %) of patients in this study would require intervention and ongoing monitoring to ensure that the recommended LDL cholesterol goal is reached and maintained. The optimal goal for HDL cholesterol is > 1.15 mmol/L (45 mg/dl). When using this clinical end point, 57 % of patients in this study were found to require intervention and ongoing monitoring. Triglycerides concentration of 28 % patients were in the high and borderline risk categories ($\geq$ 2.28 mmol/L). Similar results were found among urban African-Americans with type 2 diabetes. [22]

CONCLUSION

The relationships between the various lipid profiles and cardiovascular mortality were not significant. Whereas, high lipid levels were related to increased cardiovascular mortality with diabetes.

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