Original Article

DYSLIPIDEMIAS IN TYPE II DIABETES MELLITUS PATIENTS IN A TEACHING HOSPITAL OF LAHORE, PAKISTAN

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ABSTRACT:
Objectives: To know the pattern of dyslipidemias amongst type II diabetic patients.
Design: Observational study.
Setting: Hospital based study on type II diabetic patients, who were either admitted or reported to outpatient department/diabetic clinic on take days of Unit-I of Sir Ganga Ram Hospital, Lahore, Pakistan.
Subjects: One hundred consecutive type II diabetics between the age of 40-70 years. Those who had hyperlipidemia due to other causes e.g. nephrotic syndrome, hypothyroidism and type-I diabetes mellitus were excluded.
Main Outcome Measures: Dyslipidemias
Results: One hundred patients suffering from type II diabetes mellitus were included in the study. Out of these 64% were females and 36% were males. The age range was 41-70 years with mean of 56.1±9.38. Out of these 100 patients, duration of diabetes mellitus of less than 10 years was noted in 43% of patients and more than 10 years in 57%. Random blood sugar was 229.34±6.23 and fasting blood sugar was 153.5±4.45 when it was seen in the total study subjects, random blood sugar 210.51±7.68 and fasting blood sugar 143.83±5.35 in sub group whose duration of illness was less than 10 years. In sub group whose DM was for more than 10 years random blood sugar was 257.91±12.81 and fasting blood sugar was 171.21±8.14. Serum cholesterol was 226.88±18.48 in the patients as one group, in illness of less than 10 years, it was 191.72±5.72 and in illness of more than 10 years duration it was 213.11±6.70. Serum triglyceride in illness of less than 10 years duration was 191.83 ± 8.05 and where it was more than 10 years, it was 210.04±8.90. Serum HDL–C was 36.25±0.45 in patients illness of less than 10 years and 35.57±0.60 in more than 10 years. Serum LDL – C was 127.1±3.99 in patients with less than 10 years of diabetes mellitus and 147.5±5.20 in patients with more than 10 years of illness. Fifty-eight patients were hypertensive, 43% of the male patients were smokers.
Conclusions: Diabetic dyslipidemia is an important cause of morbidity. Duration of diabetes is associated with higher incidence of dyslipidemia. Type II DM is associated with a marked increase in the risk of CHD. Dyslipidemia is believed to be a major cause of increased risk. In this study we found elevated total serum cholesterol, LDL-C but normal HDL-C. Patients should be educated to get checked regularly for lipid abnormalities and if found to be abnormal, should control blood sugar and lipids very effectively.

KEY WORDS: Diabetes Mellitus (DM), Dyslipidemias, HDL-C, LDL-C, triglycerides, cholesterol, Coronary Heart Disease (CHD).

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INTRODUCTION

Dyslipidemia is an important component of the metabolic syndrome observed in type-II diabetes patients and is characterized by moderate hypertriglyceridemia and low levels of High Density Lipoprotein-cholesterol (HDL-C)[1]. Type-II diabetes mellitus is associated with various patterns of dyslipidemias that predispose patients to macrovascular complications like coronary heart disease. Once

clinical disease develops the patients have a poorer prognosis than normoglycaemic individuals with normal lipids. Similarly hypertriglyceridemia, low HDL-C and high Low Density Lipoprotein-cholesterol (LDL-C) represent a high risk group for CHD morbidity and mortality in type-II diabetes mellitus[2]. Hypertriglyceridemia itself is an independent risk factor for CHD[3].

Elevated serum triglycerides are commonly associated with insulin resistance and represent a valuable clinical marker of metabolic syndrome i.e. atherogenic dyslipidemia, hypertension, elevated plasma glucose and prothrombotic state further increases the risk of CHD[3]. Worsening of glycaemic control deteriorates lipid and lipoprotein abnormalities and particularly total and LDL-C is elevated with poor control of diabetes mellitus (DM).[4]

PATIENTS AND METHODS

This study was conducted in medical unit-I of Sir Ganga Ram Hospital, Lahore, Pakistan. This was hospital based, observational study in which an attempt was made to know the dyslipidemias in Type-II diabetic patients. One hundred consecutive adult Type-II diabetics patients who were between the age of 40-70 years who presented in outpatient/ inpatient department or diabetic clinic were studied. Consent of patient was taken on the first examination, blood sample was drawn for estimation of random glucose, cholesterol, triglyceride and HDL-C. Later a standard questionnaire was filled. One week later another blood sample was drawn for random blood sugar and LDL-C. All those patients who were Type-I diabetes mellitus or below the age of 40 or above 70 years were excluded. Similarly dyslipidemia due to other diseases like nephrotic syndrome, hypothyroidism were excluded from the study. Different parameters i.e. age, sex, duration of diabetes mellitus, blood sugar, lipid profile were studied and compared between two groups who had diabetes of less than ten years of duration and more. All this data was analyzed by a statiscian, Chi-square test and student "t" test at 5% level of significance were applied.

RESULTS

Out of 100 patients the duration of diabetes mellitus of less than 10 years were noted in 43% of patients and more than 10 years in 57%. Random blood sugar was 229.34 $\pm$ 6.23 and fasting blood sugar were 153.5 $\pm$ 4.45 when it was seen in total population of study whereas it was random blood sugar 210.51 $\pm$ 7.68 and fasting blood sugar 143.83 $\pm$ 5.35 in patients whose duration of illness was less than 10 years. In patients who suffered from diabetes mellitus for more than 10 years random blood sugar was 257.91 $\pm$ 12.81 and fasting blood sugar was 171.21 $\pm$ 8.14 and this was statistically significant ($p=<0.01$).

Serum cholesterol, when studied in sub group illness of less than 10 years, it was 191.72 $\pm$ 5.72 and in sub group who had diabetes mellitus for more than 10 years duration it was 213.11 $\pm$ 6.70 which is statistically significant ($p=<0.05$).

Serum triglyceride in those where illness was less than of 10 years duration it was 210.04 $\pm$ 8.90 (p value = < 0.05) which is statistically significant. Serum HDL – C was 36.25 $\pm$ 0.45 in patients who were ill for less than 10 years and 35.57 $\pm$ 0.60 in more than 10 years, (p = > 0.05) and this is not statistically significant. Serum LDL – C was 127.1 $\pm$ 3.99 in patients with less than 10 years of diabetes mellitus and 147.5 $\pm$ 5.20 in patients with more than 10 years of illness.

Fifty-eight patients were hypertensive and 42 were normotensive, 43% of the male patients were smokers whereas rest were non-smokers. None of the female patients were smokers.

DISCUSSION

This study showed that Type-II diabetes mellitus was more prevalent in females (64%) as compared to males (36%) and mean age was 56.1 $\pm$ 9.38. These findings were in contrast to a local study carried out in Rawalpindi region

which showed that it was more in males whereas age was comparable[5]. Since this hospital is affiliated with a female medical college, it may have attracted more female patients as compared to other general hospitals. Another reason could be that females usually do not go to hospitals unless they are too unwell. Gender based difference in prevalence, presentation and treatment of CHD remains an important area of controversy and research. The American Heart Association in 1998 reported CHD was leading cause of death amongst women[6]. UKPDS with the aim to compare fasting lipids amongst type II DM also showed that lipid concentrations increased with age but reached the plateau at the age of 50 years. It also observed that plasma lipids were higher in women than men, this may explain why CHD is higher in diabetic females[7,8]. Lewis et al[9] strongly recommends the primary prevention by reducing cholesterol in women. Similarly King et al[10] in their study report that risk of CHD in diabetic females are related with age, reproductive and hormonal status as well as HDL-C, triglycerides. Despite the obvious predominance of CHD in middle-aged men, CHD is currently major cause of death in diabetic women. Brochier et al. are of the opinion that after menopause women may develop coronary atherosclerosis much faster, that is why men with type-II diabetes mellitus have a two fold increased risk whereas women have fourfold increased risk of CHD[11]. It is also postulated one of reasons of higher incidence of CHD, that there may be many other risk factors amongst women prior to onset of diabetes mellitus[12], so this study was in concordance with all these studies reported earlier. Hypertension with diabetes mellitus was noted in 58% and smoking was noted in 43% of diabetic male patients. These risk factors along with obesity also enhance the atherosclerosis because of raised serum cholesterol, triglyceride and LDL- levels, low HDL-C has also been reported to be contributory factor[10]. Smoking is thought to disturb lipoprotein metabolism and cause harmful effects on blood vessels. Smoking stimulates oxidation of LDL particles which results in significant increase in triglyceride and fall in HDL-C and is thought to be due to insulin resistance[13].

In this study random blood sugar was 229.34 $\pm$ 6.23 and fasting blood sugar was 153.5 $\pm$ 45 and it was higher in those patients in whom illness was of more than 10 years. Similarly dyslipidemias were also more pronounced in patients who had a longer history of diabetes mellitus. Aboola-Abu CF et al[14] in Nigeria also had similar findings. They also reported that better glycaemic control helped improve dyslipidemia. It has also been reported that controlling dyslipidemia and good glycaemic control delays, atherosclerosis and prevent CHD[15,16].

In our population diabetic and lipid control is usually poor due to various reasons like ignorance, socio-economic and false beliefs of treatments, hence it is noted that in our population complications of diabetes are more pronounced and higher as compared to the West[5,17].

CONCLUSIONS

Diabetic dyslipidemia is an important cause of morbidity. Duration of diabetes is associated with higher incidence of dyslipidemias. It is believed to be a major cause of increased risk for CHD. In this study we found elevated total serum cholesterol, LDL-C but normal HDL-C. We conclude that patients should be educated to get regular check-up for lipid abnormalities. If it is abnormal they should ensure effective blood sugar and lipid control.

REFERENCES

1. Betteridge DJ. Diabetic dyslipidemia. Diabetes Obes Metab 2000; 2 Suppl 1: S31-6.
2. Henkel E, Hanefeld M. Hyperlipidemia and fibrates with special reference to diabetes. Herz 2001; 26(8): 523-30.
3. Ginsberg HN. Identification and treatment of hypertriglyceridemia as a risk factor for coronary heart disease. Curr Cardiol Rep 1999; 1(3): 233-7.
4. Grundy SM. Hypertriglyceridemia, insulin resistance, and the metabolic syndrome. Am J Cardiol 1999; 83(9B): 25F-29F.

5. Hashim R, Khan FA, Khan DA, Shaukat A. Prevalence of macrovascular complications in diabetics of Wah, District Rawalpindi. J Pak Med Assoc 1999; 49(1): 8-11.

6. Laakso M. Dyslipidemia, morbidity, and mortality in non-insulin dependant diabetes mellitus. Lipoproteins and coronary heart disease in non-insulin dependant diabetes mellitus. J Diabetes Complications 1997; 11(2): 137-41.

7. Berra K. Women, coronary heart disease, and dyslipidemia: dose gender alter detection, evaluation, or therapy? J Cardiovasc Nurs 2000; 14(2):59-78.

8. U.K. Prospective Diabetes Study 27. Plasma Lipids and lipoproteins at diagnosis of NIDDM by age and sex. Diabetes Care 1997; 20(11):1683-7.

9. Lewis SJ. Cholesterol and coronary heart disease in women. Cardiol Clin 1998; 16(1): 9-15.

10. King KB, Mosca L. Prevention of heart disease in women: recommendations for management of risk factors. Prog Cardiovasc Nurs 2000; 15(2): 36-42.

11. Brochier ML, Arwidson P. Coronary heart disease risk factors in women. Eur Heart J 1998; 19 Suppl A: A45-52.

12. Haffner SM, Miettinen H, Stern MP. Relatively more atherogenic coronary heart disease risk factors in pre-diabetic women than in pre-diabetic men. Diabetologia 1997; 40(6): 711-7.

13. Oh HS, Seo WS. Inter-relationships between arterisclerotic risk factors: a metab-analysis. Yonsei Med J 2000; 41(4): 450-8.

14. Lepsanovic L, Brkljac O, Lepsanovic L. Effect of smoking on lipoprotein metabolism. Med Preg 2001; 54(9-10): 453-8.

15. Aboola-Abu CF, Ohwovoriole AE, Akinlade KS. The effect of glycaemic control on the prevalence and pattern of dyslipidemia in Nigerian patients with newly diagnosed non-insulin dependent diabetes mellitus. West Afr J Med 2000; 19(1): 27-33.

16. Alagozlu H, Gultekin F, Candan F. Lipid and lipoprotein patterns in type 2 non-obese diabetic patients Do LP(a) levels decrease with improved glycaemic control in these patients? Nutr Metab Cardiovasc Dis 2000; 10(4): 204-8.

17. Naheed T, Akbar N, Akbar N. Skin manifestation amongst diabetic patients admitted in general medical ward for various other problems. Pak J Med Sci 2002;18(4)291-296.