WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH
www.wjpmr.com

DYSLIPDEMIA IN SUDANESE TYPE 2 DIABETIC PATIENTS AT DIABETIC MEDICAL CENTRE- MEDANI- GEZIRA STATE JULY - MARCH– 2016- 2017

Dr. Yasir Abdalla Hussein Hakim*[1], Kanan Sanorhi[1], Asad Adam Abass[2], faiez Yousif[3], Abubaker Talha[4], Adil Khalil[4]

[1]Department of Basic Medical Basic Sciences, College of Medicine, Dar Uloom University, KSA.
[2]College of Medicine, Department of Pathology, Sennar, University, Sudan.
[3,4]College of Medicine, Department of Pathology, Gezira University, Sudan.

*Corresponding Author: Dr. Yasir Abdalla Hussein Hakim

Department of Basic Medical Basic Sciences, College of Medicine, Dar Uloom University, KSA.

ABSTRACT

Background: Dyslipidemia is one of the major risk factors for cardiovascular disease in diabetes mellitus. The characteristic features of diabetic dyslipidemia are a high plasma triglyceride concentration, low high density lipoprotein cholesterol concentration and increased concentration of small dense low density lipoprotein-cholesterol particles. **Objective:** The purpose of this study is was to determine the lipid Profiles in Sudanese patients with type 2 diabetes mellitus. **Materials and Methods:** The subjects of study were the adult type 2 diabetic patients (80) of both cases and control attending the Centre. The study included 80 Sudanese patients; half of them with type 2 diabetes mellitus (cases) and the rest are non-diabetics (control group). Venous blood samples were taken from all after at least 10 hours fasting for determination of serum level of cholesterol, triglycerides, high density lipoprotein and low density lipoprotein. Glucose level was also measured. Cases and controls were compared in all measures above looking for the differences. **Result:** in cases fasting blood glucose, high density lipoprotein, low density lipoprotein, triglyceride, total cholesterol, were found to be 87.5% (35 cases), 64.5% (28 cases), 77.5% (31 cases), 50% (20 cases), 32.5% (17 cases) respectively. In control group, fasting blood glucose, high density lipoprotein, low density lipoprotein, triglyceride, total cholesterol were found to be 100% (40 cases), 100% (40 cases), 100% (40 cases), 100% (40 cases), 100% (40 cases) respectively. **Conclusion**s: The study revealed that the prevalence of dyslipidemia among Sudanese type 2 diabetic patients is remarkably increasing compared to non-diabetic control group.

KEYWORDS: Dyslipdemia, Diabetes Mellitus type 2, Blood Glucose, Selection criteria.

INTRODUCTION AND LITERATURE REVIEW

Type 2 diabetes is associated with a cluster of interrelated plasma lipid and lipoprotein abnormalities, including reduced HDL cholesterol, a predominance of small dense LDL particles, and elevated triglycerides.[1] These abnormalities occur in many patients despite normal LDL cholesterol levels. These changes are also a feature of the insulin resistance syndrome (also known as the metabolic syndrome), which underlies many cases of type 2 diabetes. In fact, pre-diabetic individuals often exhibit an atherogenic pattern of risk factors that includes higher levels of total cholesterol, LDL cholesterol, and triglycerides and lower levels of HDL cholesterol than individuals who do not develop diabetes.[2,3] Insulin resistance has striking effects on lipoprotein size and subclass particle concentrations for VLDL, LDL, and HDL.[4,5]

There is evidence that each of these dyslipidemia features is associated with increased risk of cardiovascular disease, the leading cause of death in patients with type 2 diabetes. Numerous studies have demonstrated an association between LDL size or density and coronary artery disease (CAD)[6,13] Moreover, recent reports have indicated that LDL particle concentrations, and specifically levels of small dense LDL, are predictive of coronary events and that this is independent of other coronary disease risk factors.[14,16]

Although lowering LDL cholesterol is important in decreasing cardiovascular disease morbidity and mortality, there are a number of other factors contributing to the disease process that can be favorably affected by drug therapy. Among these factors are subspecies of the major lipoprotein classes, such as triglyceride-rich lipoprotein remnants and small dense LDL, that are not detected by standard lipid testing. It is

therefore possible that at least part of the CAD benefits observed in CAD prevention trials can be attributed to pharmacological effects on specific types of lipoprotein particles. This article will review the pathophysiology of diabetic dyslipidemia and the relationship between reduced HDL levels, increased small dense LDL particles, elevated triglycerides, and cardiovascular risk. Current therapeutic options for the management of diabetic dyslipidemia and clinical trials that provide evidence of the benefits of treating this atherogenic dyslipidemia also will be discussed.

MATERIALS AND METHODS

The study was carried out at Medical Diabetic Centre in Medani- Gezira Sate in the periods of 7 July to 25 February 2015. Diabetic patients constitute a large proportion of the clinic's patients. They used to come regularly to monitor their blood glucose level and to manage any intercurrent illness. The population of study was all the adult type 2 diabetic patients attending the Internal Medicine Clinic. The following groups of patients were excluded: a) Patients with other diseases that may affect blood lipids such as renal, thyroid and liver diseases. b) Patients with familial Hypercholesterolemia c) Patients taking lipid lowering drugs d) Patients taking drugs or other materials that may affect blood lipids such as alcohol, diuretics, beta blockers and contraceptive pills. e) Patients with major amputations because their body mass index could not be calculated accurately. The consent of the patient was obtained. A full explanation of the purposes, nature and procedures of the study was conveyed to them. The potential participants were clearly assured that their participation in this study is voluntary and that they could withdraw at any stage and that any data obtained would be treated confidentially and for the purpose of the research only. Forty patients were found to be eligible and were included after diagnoses of type 2 diabetes by a clinician with forty cases were included as control group. The data for this study was collected at three stages. Relevant data regarding personnel information (age, sex, duration of diabetes, family history and management) in addition to demographic information were collected using a questionnaire. The second stage was the anthropometric measurements and chemical analysis for blood glucose and lipid levels was carried out.

RESULT

The study included 80 subjects of both ill cases and control group was enrolled in the study. 43(107.5%) were females of both ill and control group and 37(92.5%) were males, their ages ranged from 40 to 60 years. The most common chemical analysis findings in the study group was elevated fasting blood glucose (FBG) in pts 87.5% above 126 mg /dl, compared to normal control of group 100% within the normal blood glucose level fig . And low high density lipoprotein (HDL) in ill patient was in 21 pts females 52.5% was poor in less than 50 mg/dl and in (7)12% patients was

poor in males in less than 40 mg/dl, compared to normal control group of (40)100% pts were normal in more than 60 mg/dl fig (1).

The majority of low density lipoprotein (LDL-C) fig (2) ratio was increased in ill patient 77.5% for more than 160 mg/dl compared to normal group. Which categorized in normal reference in less than 100 mg/dl equal 40 (100%) of cases.

The distributing of triglyceride fig (3) in ill patients was (13) 32.5% pts were high, (7) 17.5 % also borderline high, (20) 50% patients was normal compared to (40) 100% of patients were normal values.

The total cholesterol level was increased in ill-patients 5 patients (12.5%) for more than 240 mg/dl followed by 12 patients (30%) was border line high in between 200 to 239 mg/dl and 57.5% of patients were normal for less than 200 mg/dl compared to normal group with 95% for less than 200 mg/dl which was normal reference.
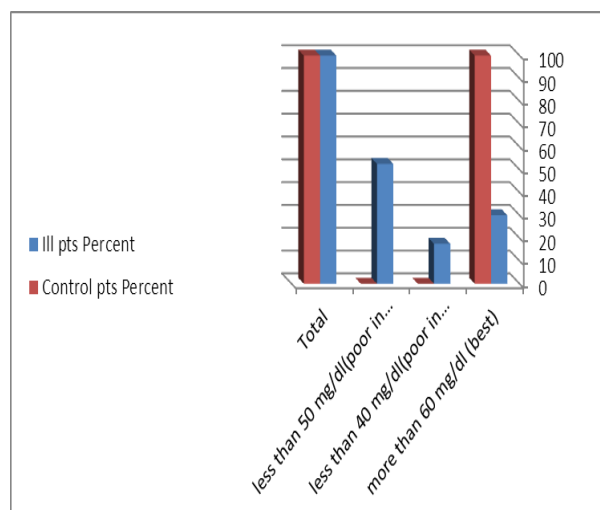

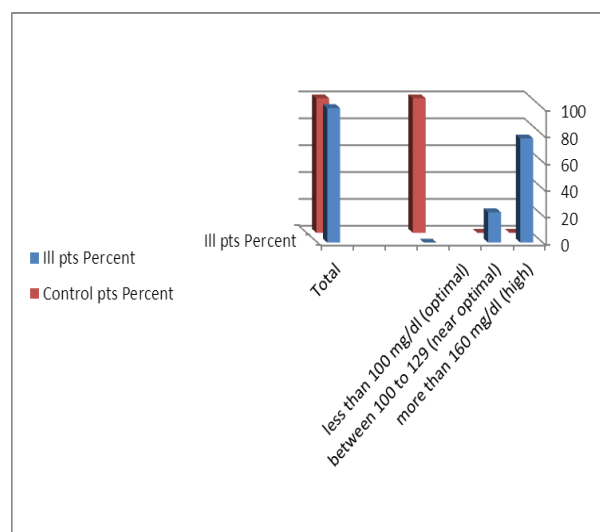**Fig 1: Prevalence of HDL-C in study group.**

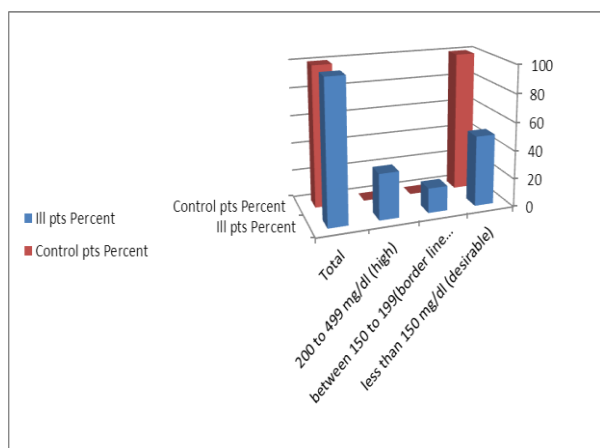**Fig 2: Frequency of LDL-C in study group.**

Fig 3: Distribution of triglycerides in study group.

DISCUSSION

The majority of ill patient between 40 -60 years of (23) patients 57%, followed by 60-80 years of 15 patients (37.5), from 80 - 100 of 1 patient (2.5), followed by 1 patients (2.5) between 20-40 years of 40 patients compared to control group the majority of them in between 40-60 years of 20 patients(50%), 14(35%) patients from 20-20 year, 4(10%) patients between 60-80year, 2(5%) patients between 80-100 years. The ratio of ill patient was 27 (67.5%) of female patients and 13 (32.5%) of male patients, Compared to normal control, the ratio of females to males 16(40%) and males 24 60%. Duration of DM in patients was 5-10 years in(16) patients 40%,(13) patients 32.5%, from 10 to 15 year in (7) patients17.5%, from 1 to 5 years in 2 patients 5%, Compared to control group 26 pts 65% from 1-5 year, 12 pts 30% from 5-10 years and 2 pts 5% from 10-15 year. The distribution of treatment in ill cases was (34) 85% on diet and oral hypoglycemic agents, and the rest on insulin (6)pts 15% compared to normal control without treatment 40 patients (100%). Fasting blood glucose (FBG) in 35 pts 87.5% above 126 mg were diabetes, 4 (10%) pts 101-126 mg/dl were prediabetesand 1 patient (2.5%) was in normal.

Reference compared to normal control (40) of patients 100% within the normal blood glucose level. The total cholesterol level was increased in ill-patients 5 patients (12.5%) for more than 240 mg/dl followed by 12 patients (30%) was border line high in between 200 to 239 mg/dl and 57.5% of patients were normal for less than 200 mg/dl compared to normal group with 95% for less than 200 mg/dl which was normal reference. The majority of low density lipoprotein ratio was increased in ill patient 77.5% for more than 160 mg/dl compared to normal group which categorized in normal reference in less than 100 mg/dl equal 40 (100%) of cases. The high density lipoprotein (HDL) in ill patient was in 21 pts females 52.5% was poor, in (7)12% patients was poor in males and (12) 30% were normal compared to normal control of (40)100% pts were normal. The distributing of triglyceride in ill patients was (13) 32.5% pts were high, (7) 17.5 % also borderline high, (20) 50% patients was

normal compared to (40) 100% of patients were normal values.

CONCLUSION

The study revealed that the prevalence of dyslipidemia among Sudanese type 2 diabetic patients is remarkably increasing compared to those of non-diabetic control subjects.

REFERENCES

1. American Diabetes Association: Management of dyslipidemia in adults with diabetes (Position Statement). Diabetes Care, 2003; 26(Suppl. 1): S83–S86.
2. Haffner SM, Mykkanen L, Festa A, Burke JP, Stern MP: Insulin-resistant prediabetic subjects have more atherogenic risk factors than insulin-sensitive prediabetic subjects: implications for preventing coronary heart disease during the prediabetic state. Circulation, 2000; 101: 975–980.
3. Haffner SM, Stern MP, Hazuda HP, Mitchell BD, Patterson JK: Cardiovascular risk factors in confirmed prediabetic individuals: does the clock for coronary heart disease start ticking before the onset of clinical diabetes? JAMA, 1990; 263: 2893–2898.
4. Garvey WT, Kwon S, Zheng D, Shaughnessy S, Wallace P, Hutto A, Pugh K, Jenkins AJ, Klein RL, Liao Y: Effects of insulin resistance and type 2 diabetes on lipoprotein subclass particle size and concentration determined by nuclear magnetic resonance. Diabetes, 2003; 52: 453–462.
5. Reaven GM, Chen YD, Jeppesen J, Maheux P, Krauss RM: Insulin resistance and hyperinsulinemia in individuals with small, dense low density lipoprotein particles. J Clin Invest, 1993; 92: 141–146.
6. Austin MA, King MC, Vranizan KM, Krauss RM: Atherogenic lipoprotein phenotype: a proposed genetic marker for coronary heart disease risk. Circulation, 1990; 82: 495–506.
7. Austin MA, Breslow JL, Hennekens CH, Buring JE, Willet WC, Krauss RM: Low-density lipoprotein subclass patterns and risk of myocardial infarction. JAMA, 1988; 260: 1917–1921.
8. Campos H, Genest JJ Jr, Blijlevens E, McNamara JR, Jenner JL, Ordovas JM, Wilson PWF, Schaefer EJ: Low density lipoprotein particle size and coronary artery disease. Arterioscler Thromb Vasc Biol, 1992; 12: 187–195.
9. Coresh J, Kwiterovich PO Jr, Smith HH, Bachorik PS: Association of plasma triglyceride concentration and LDL particle diameter, density, and chemical composition with premature coronary artery disease in men and women. J Lipid Res, 1993; 34: 1687–1697.
10. Crouse JR, Parks JS, Schey HM, Kahl FR: Studies of low density lipoprotein molecular weight in human beings with coronary artery disease. J Lipid Res, 1985; 26: 566–574.

11. Gardner CD, Fortmann SP, Krauss RM: Association of small low-density lipoprotein particles with the incidence of coronary artery disease in men and women. JAMA, 1996; 276: 875–881.

12. Griffin BA, Freeman DJ, Tait GW, Thompson J, Caslake MJ, Packard CJ, Shepherd J: Role of plasma triglyceride in the regulation of plasma low density lipoprotein (LDL) subfractions: relative contribution of small, dense LDL to coronary heart disease risk. Atherosclerosis, 1994; 106: 214–253.

13. Lamarche B, Tchernof A, Moorjani S, Cantin B, Dagenais GR, Lupien PJ, Després J-P: Small, dense low-density lipoprotein particles as a predictor of the risk of ischemic heart disease in men: prospective results from the Quebec Cardiovascular Study. Circulation, 1997; 95: 69–75.

14. Blake GJ, Otvos JD, Rifai N, Ridker PM: Low-density lipoprotein particle concentration and size as determined by nuclear magnetic resonance spectroscopy as predictors of cardiovascular disease in women. Circulation, 2002; 106: 1930–1937.

15. Rosenson RS, Otvos JD, Freedman DS: Relations of lipoprotein subclass levels and low-density lipoprotein size to progression of coronary artery disease in the Pravastatin Limitation of Atherosclerosis in the Coronary Arteries (PLAC-I) trial. Am J Cardiol, 2002; 90: 89–94.

16. St-Pierre AC, Bergeron J, Pirro M, Cantin B, Dagenais GR, Despres JP, Lamarche B, Quebec Cardiovascular Study: Effect of plasma C-reactive protein levels in modulating the risk of coronary heart disease associated with small, dense, low-density lipoproteins in men (the Quebec Cardiovascular Study). Am J Cardiol, 2003; 91: 555–558,