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RESEARCH ARTICLE

DYSLIPIDEMIA – TYPE 2 DIABETES AND NON DIABETES POPULATION IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Patients with diabetes mellitus are at high risk of cardiovascular events because of abnormal lipid status. Dyslipidemia is common in diabetes mellitus and is associated with cardiovascular complications. Early diagnosis and treatment is the main cornerstone in the prevention of its multiple complications. The aim of the study was to determine the prevalence of abnormal lipid profit levels. Already diagnosed type 2 diabetic patients and Ninety-two (92) The study population was made up of Eighty- five (85) with an age range of 28 to 70 years, who come from routine health, follow up at various tertiary hospitals in Erode. The samples were analyzed using the chemical analyzer COBAS INTEGRA 400. Dyslipidemia was found in 63.52% in type2 diabetes patients and 43.47% in non-diabetic patients. High TG, high LDL-C, high TC and low HDL-C exhibited an increasing trend in the proportion of patients with dyslipidemia. The following risk factors namely female sex, age above 50- years, BMI (overweight and obese), poor glycemic control, central obesity and physical inactivity were associated with diabetic dyslipidemia. This study presents some interesting and novel findings which may be very important in the care and management of patients with type-2 diabetes.

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INTRODUCTION

Diabetes is a serious, long-term condition with a major impact on the lives and well-being of individuals, families, and societies worldwide. It is among the top 10 causes of death in adults, and was estimated to have caused four million deaths globally in 2017 (IDF Diabetes Atlas., 2017). Diabetes mellitus (DM) is a multifactorial disease that occurs in genetically susceptible individuals under the in□uence of environmental factors (WHO. 2016). Type2 Diabetes mellitus (T2DM) is one of the most causative important factors of mortality in the developing countries where it affects more than 170 million persons all over the world (complication (VinodMahato *et al*., 2011; Jaiswal *et al*., 2014) Regular exercise has been shown to give many benefits in controlling diabetes as well as a positive effect on lowering the lipid. Dietary modification and lipid-lowering medications can reduce serum lipid levels and lower the occurrence of CVD events (Jonsson et a., 1999).

PATHOPHYSIOLOGY OF DIABETIC DYSLIPIDEMIA:
Dyslipidemia is common in DM, as both insulin deficiency and resistance affects enzymes and pathways of lipid metabolism (Gibbons *et al*., 2002). Dyslipidemia and hypertension are major modifiable risk factors for T2DM and related CAD, which account for more than 87% of disability in low- and middle-income countries (Chahil., 2006). The precise pathogenesis of diabetic dyslipidemia is not known; nevertheless, a large body of evidence suggests that insulin resistance has a central role in the development of this condition (Taskinen., 2002; Krauss and Siri., 2004; Solano and Goldberg., 2005). Dyslipidemia affects approximately 70% to 97% of people with diabetes. World Health Organization (WHO) in Chamba *et al*., 2017 2002 reported that dyslipidemia accounted for 18% of ischemic heart disease, 56% of stroke and over 4million deaths per year globally (World Health Organization, 2002).

Lipids play a very important role in the physiologic functions of the body. Lipid abnormalities in patients with diabetes, often termed "diabetic dyslipidemia", are typically characterized by high total cholesterol (T-Chol), high triglycerides (Tg), low high density lipoprotein cholesterol (HDL-C) and increased levels of small dense LDL particles. Low density lipoprotein cholesterol (LDL-C) levels may be moderately increased or normal. Lipid abnormalities are common in people with T2DM and prediabetes. Regular exercise has been shown to give many benefits in controlling diabetes as well as a positive effect on lowering the lipid. Dietary modification and lipid-lowering medications can reduce serum lipid levels and lower the occurrence of CVD events (Jonsson *et al*., 1999).

MATERIALS AND METHODS

The study population was made up of Eighty five (85) already diagnosed type 2 diabetic patients and Ninety two (92) with an age range of 28 to 70 years, who come from routine health, follow up at various tertiary care hospital in Uttar Pradesh. The purpose of the study was explained to the participants, all participants gave their written consent prior to inclusion in the study. Information concerning age, gender, family history of diabetes, level of education and occupational was collected by questionnaire. All study subjects were asked to fill out the questionnaire. After an overnight fast, blood samples were collected for Lipid profile. Total cholesterol and triglyceride was determined using the enzymatic method, HDL-C was determined using the homogenous enzymatic colorimetric method (Sampson, M. L., Aubry, A., Csako) Cholesterol (LDL-C) was determined from the Freidwald's formula: LDL-C=TC-(HDL-C+TG/5). The samples were analyzed using the chemical analyzer COBAS INTEGRA 400.

RESULTS

A total of 177 samples, with Eighty-five diabetes mellitus type 2 and Ninety-two non-diabetes patients with an age 28 to 70 were included in the study. Eighty-two (46.32%) patients were males. Ninety-five (53.67%) patients were females. Duration of diabetes ranged from 5 months to 20 years. More than half of the patients 64 (75.29%) had diabetes for more than 5 years and 21 (24.60%) for up to 5 years. Sixty eight (80%) had poor glycemic control HbA1C >7%. Of the Eighty-five type2 diabetic patients, 48 (58.47%) were hypertensive and in Twenty-six (30.58%) patients reported to be smokers and alcohol intake was significant in Eighteen (21.17%) of the patients. About 23 (27%) of the patients had a normal BMI, 39 (45.88%) were obese. Total ninety-two non-diabetic patients, 36 (39.13%) were hypertensive and in Twenty-one (22.82 %) reported to smokers and Eighteen (19.56 %) alcohol intake non-diabetic patients. (Table 1) Dyslipidemia was found in 63.52% in type2 diabetes patients and 43.47% in non-diabetic patients. The patterns of lipid abnormalities are presented in (Table 2).

Table 1. Demography of study population

	Male	Female
Type 2 DM	**47.5%**	**52.5%**
Non Diabetic	**45.6%**	**54.3%**
Mean Age	**59**	

Table 2. Lipid profile of type 2 diabetic patients

Paremeters	Mean	Control	Mean + SD
TG	215.25 mg/dl	49 mg/dl	198.02 mg/dl
HDL	47.56 mg/dl	59 mg/dl	49.35 mg/dl
LDL	120.21 mg/dl	43 mg/dl	135.62 mg/dl

High TG, high LDL-C, high TC and lowHDL-C exhibited an increasing trend in the proportion of patients with dyslipidemia. The following risk factors namely female sex, age above 50- years, BMI (overweight and obese), poor glycemic control, central obesity and physical inactivity were associated with diabetic dyslipidemia. Other variables namely duration of diabetes mellitus, the type of diabetes mellitus, smoking habits and hypertension were not significant in the association of dyslipidemia. The various lipid parameters were analyzed against the different age groups among the Diabetic and Non-diabetic participants. It was realized that Type2 diabetic patients had the highest TC (71.8%), TG (62.4%) and LDL-C (55.3%) level compared to Non-diabetic patients had lowest TC (46.47%) and TG (38%) values. The value of HDL and LDL-C was also low in Type2 diabetic patients which compare to Non-diabetic patients respectively. (Table 2)

DISCUSSION

The outcome of the study indicates that there is significant difference in lipid parameters between Type2 diabetes and Non-diabetes patients. We saw proportional increment in LDL-C and Triglycerides in Type 2 diabetes patients as the age of participants increased. Furthermore, the coronary risk factor was higher in Type 2 diabetes than Non-diabetes and the difference was significant. There are also, both strong positive and negative correlations of lipid parameters. This study presents some interesting and novelfifindings which may be very important in the care and management of patients with type-2 diabetes.

CONCLUSION

The prevalence of dyslipidemia is high for Type2 Diabetes participants. There is an urgent need for effective strategies for primary prevention of obesity, diagnosis and treatment of dyslipidemia among diabetic patients. Type 2 DM and other diabetics must be educated on the risks they face as a result of their condition and the necessary steps they need to manage it.

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