HYPERLIPIDEMIA PATTERNS IN NEWLY DIAGNOSED YOUNG DIABETIC SOLDIERS: A DESCRIPTIVE CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: To report the patterns of hyperlipidemia in newly diagnosed young diabetic soldiers.
Study Design: A descriptive cross-sectional study.
Place and Duration of Study: Combined Military Hospital Multan, from Jan to Sep 2017.
Material and Methods: All newly diagnosed hospitalized type-II diabetic male soldiers, were included in the study after having their informed consent. All the data was collected protectively through consecutive sampling. Data collection tool was developed regarding patient demographics, co-morbids, previous medical history and laboratory findings.
Results: A Total of 55 patients were recruited for the study. The mean age of the patients was 41.1 ± 5.5 years and the range was 25 years to 50 years. All patients were males. Eight (14.5%) patients had diabetic nephropathy while diabetic retinopathy was present in 7 patients (12.7%). Family history was positive in 22 (40%) soldiers. Six (10.9%) patients were hypertensive while thirty nine patients (70.1%) were having type-II diabetes and 16 (29.1%) had type-I diabetes mellitus. About 46 (83.6%) patients had trace proteinuria, out of which 3 patients had +1proteinuria and 4 patients had +2 proteinuria. Mean LDL was 1.1 ± 4.1 mmol/L. Mean cholesterol was 4.5 ± 0.9 mmol/L while mean triglycerides was 2.4 ± 1.7 mmol/L andmean HDL 0.9 ± 2.0 mmol/L.
Conclusion: The study has clearly demonstrated statistically that high triglyceride levels are more prevalent than high LDL cholesterol levels in this patient group. Keeping the fact in view that hypertriglyceridaemia is a serious risk factor for the development of coronary artery disease it is therefore of paramount importance that this abnormality should be sought out at the outset of diabetes mellitus and addressed accordingly.

Keywords: Hyperlipidemia, Diabetic Nephropathy, Diabetic Retinopathy.

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INTRODUCTION

Diabetes mellitus is one of the leading causes of chronic morbidity and mortality. Diabetes mellitus prevalence is increasing many folds in South Asian population. Many factors like high body mass index, high susceptibility to environmental insulin, high degree of genetic predisposition and high level of insulin resistance are involved in this metabolic disorder[1]. It is characterized by absolute deficiency in insulin secretion and insulin action associated with hyperglycemia, metabolism of protein, carbohydrate and lipids are disturbed[2]. Different research studies show that body composition components like lipid profile and body fat are responsible for the increased prevalence of this disease[3]. In diabetes mellitus the lipid abnormalities are more prevalent because major key enzymes and lipid metabolism pathways are affected due to deficiency of insulin production and secretion[3]. Dyslipidemia is one of the major risk factors for cardiovascular disease in hyperglycemic patients. High triglycerides, low High Density Lipoprotein cholesterol, and increased Low Density Lipoprotein cholesterol are the characteristic feature of diabetic dyslipidemia. Type-II diabetes affects an estimated 21 million people in the United States[4]. About 70-80% of diabetic patients will die of cardiovascular disease[5]. The prevalence of hypercholesterolemia is not increased in patients with diabetes mellitus but mortality from coronary heart disease increases. American Diabetes Association

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guidelines recommend maintaining serum levels of TG below 150 mg/dl, LDL cholesterol below 100 mg/dl and HDL cholesterol of more than 40 mg/dl in males and 50 mg/dl in females[6].

The life style changes of the modern era have complicated the situation further. One has to keep in mind that the metabolic derangements so produced are to a significant extent preventable and reversible[7]. In the whole world about 382 million people are the victim of hyperglycemia. The regions of high prevalence are North America and Caribbean about 11%[8]. According to International Diabetes Federation estimates in 2013, 35 countries out of 219 countries have about 12% prevalence of diabetes. 10-19% of Asian population is currently affected due to diabetes[10,16]. In Pakistan 7.1 million people suffer due to diabetes[17]. The data from Pakistan showed a prevalence rate of 18-46% while 46-75% Pakistani patients with diabetes had metabolic syndrome[9,10].

One very important scenario is the triad of hyperlipidemia, type-II diabetes and coronary artery disease whereby the severity of coronary artery disease is more pronounced[10]. This study was conducted to analyse and document the frequency of hypertriglycridaemia and hyper-lipidemia in a cohort of young male soldiers of productive age group with newly diagnosed type-II diabetes mellitus.

MATERIAL AND METHODS

This study was conducted at CMH, Multan from January to September 2017. All newly diagnosed hospitalized type-II diabetic male soldiers were included in the study after having their informed consent. These patients were from Armed Forces who clustered in a few months' time.

Data Analysis

All the data was collected protectively through consecutive sampling. Data collection tool was developed regarding patient demo-graphics, co-morbids, previous medical history and laboratory findings. Fasting samples were collected and analyzed for LDL cholesterol, total cholesterol and triglyceride levels. The fasting period was at least 9 hours and the maximum 12 hours. Exclusion criteria were patients on lipid lowering drugs as well as those patients who already were on dietary restriction. Patients who were obese were not included in the study. Also excluded were patients on who were alcoholic, on diuretics and beta blockers. High triglyceride levels were considered as readings above 1.7 mmol/L and high LDL cholesterol levels were considered readings above 2.59 mmol/L. Data was entered and analyzed in SPSS version 23.

RESULTS

A Total of 55 patients were recruited for the study. The mean age of the patients was 41.1 ± 5.5 years and the range was 25 years to 50 years. All patients were males. Eight (14.5%) patients had diabetic nephropathy while diabetic retinopathy was present in 7 patients (12.7%). Macrovascular complications were seen in 2 (3.6%) patients. Family history was positive in 22 (40%) soldiers. Six (10.9%) patients were hypertensive while thirty nine patients (70.1%) were having type-II diabetes and 16 (29.1%) had type-I diabetes mellitus. About 46 (83.6%) patients had trace proteinuria, out of which 3 patients had +1proteinuria and 4 patients had +2 proteinuria.

Mean LDL was 1.1 ± 4.1 mmol/L. Mean cholesterol was 4.5 ± 0.9 mmol/L while mean triglycerides was 2.4 ± 1.7 mmol/L and mean HDL 0.9 ± 2.0 mmol/L. Mean HBA1c was found to be 8.4 ± 1.1 as shown in table.

DISCUSSION

The risk of cardiovascular heart diseases in hyperglycemic patients is two to four times more as compare to normal. Lipid abnormalities (increased level of LDL, VLDL and triglycerides; and low levels of HDL) are an important cause of atherogenesis and known as atherogenic dyslipidemia[10]. Lipid abnormalities may be the result of unbalanced metabolic state of diabetes and improved control of hyperglycemia does moderate diabetes-associated dyslipidemia[11]. Fifty five patients were recruited for this study. Majority (78.5%) of the hyperglycemic patients

were aged above 40 years. The age of diabetic patients was observed to be above 40 years confirmed by earlier literature, previous studies reported that age plays a major role in the risk of developing type-II diabetes especially after 40 years[12]. The results showed in the present study that in hyperglycemic patients the lipid level are higher and the similar results were shown by Agrawal et al 2014 and Huang et al 2014.

In our study prevalence of dyslipidemia was 29.7% in hyperglycemic patients. Two different studies conducted in India showed the prevalence of dyslipidemia in hyperglycemic patients was 89.0% and 92.4% (Udawat et al., 2001, Jayarama et al., 2012)[13]. In this study high prevalence of dyslipidemia could be credited to urbanization in the population from villages. Modernized life style associated with increasing urbanization, characterized by less physical activity and change of diet plan causes obesity leads to development of diabetes type-II.

The most common pattern of dyslipidemia was combined dyslipidemia with high LDL and low HDL this pattern of combined dyslipidemia was also studied in another study conducted in Southern India by Jayarama[14]. It was found that the prevalence of dyslipidemia in type-II diabetes mellitus as a whole was 86.75% with 29.7% single parameter of dyslipidemia, hypertriglycerides was found in about 56.46% and low HDL was found in about 72.92%[15]. The most prevalent lipid abnormality in our study was high LDL 24.3%

Table: Clinical characteristics of the patients.

Variables	n (%)
Age	(Mean ± SD) 41.15 ± 5.5 years (Range) 25-50 years
Diabetic nephropathy	8 (14.5%)
Diabetic retinopathy	7 (12.7%)
Macrovascular Complications	2 (3.6%)
Hyperglycemic Hyperosmolar Non-ketotic Coma history	1 (1.8%)
Family History	22 (40.0%)
Hypertension	6 (10.9%)
Diabetes Type	
Type I	16 (29.1%)
Type II	39 (70.9%)
Proteinuria	
Trace	46 (83.6%)
+1	3 (5.5%)
+2	4 (7.5%)
Hyperlipidemia	(Mean ± SD) 4.5 ± 0.9 mmol/L
Hypertriglyceridemia	(Mean ± SD) 2.4 ± 1.7mmol/L
LDL	(Mean ± SD)1.1 ± 4.1mmol/L
HDL	(Mean ± SD) 0.9 ± 2.0mmol/L
Urea	(Mean ± SD) 3.0 ± 24.0mmol/L
Creatinine	(Mean ± SD) 96.7 ± 67.4µmol/L
HbA1C	(Mean ± SD) 8.4 ± 1.1mmol/L
ALT	(Mean ± SD) 49.8 ± 4.8 units/L
BSF	(Mean ± SD) 198.5 ± 63.8mg/dL
BSR	(Mean ± SD) 311.7 ± 97.5mg/dL

followed by low HDL 27.6% whereas in another study conducted in Kuwait isolated dyslipidemia is the second most common pattern with increased LDL-cholesterol, observed in 21% of the patients[4]. Kandula et al conducted a study in Hyderabad (India) showing that prevalence of dyslipidemia was 86%, while high total cholesterol was 41%, LDL was 64%, triglycerides was 47% and low HDL was 71%[14]. This prevalence of dyslipidemia was relevant to our study. A study conducted in Nishtar Hospital Multan showed that 21% patients with diabetes had raised serum cholesterol and 34.2% had raised serum triglyceride level[3,16], while in another study conducted in 2011, 14% diabetic patients had raised cholesterol level while 31% patients had raised TG level[17,18]. In our study high cholesterol level was found in 29.7% patients and high serum TG found in 49.0% hyperglycemic patients. Different values of serum cholesterol may be due to different dietary habits of people in different cities of the country.

According to different previous studies diabetes mellitus has been one of the most prevailing diseases. Its complications may cause death directly and indirectly[19,20]. According to a study of 100 patients, 31% hyperglycemic patients had vision problem, 81% were hypertensive, 40% had neuropathy and 26% had nephropathy[21]. But in our study most prevalent complication associated with hypertension, nephropathy and retinopathy was about 6%, 8% and 7% respectively. The complications can be reduced by management of diabetes. Further research would be done to determine the management of dyslipidemia and other complications. Adequate knowledge about the different factors controlling diabetes and its complications are important. Improper diet, treatment and life style may be the leading cause of dyslipidemia and other complications.

CONCLUSION

The study has clearly demonstrated that high triglyceride levels are more prevalent than high LDL cholesterol levels in our patient group. Keeping the fact in view that hypertriglyceridaemia is a serious risk factor for the development of coronary artery disease it is therefore of paramount importance that this abnormality should be sought out at the outset of diabetes mellitus and addressed accordingly.

CONFLICT OF INTEREST

This study has no conflict of interest to be declare by any author.

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