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Prevalence and Patterns of Dyslipidemia among Type 2 Diabetes Mellitus Patients in Tripura, in 2021.

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ABSTRACT: Dyslipidemia is one of the major risk factors for cardiovascular disease in type 2 Diabetes mellitus.It plays an important role in the pathogenesis and progression of microvascular and macrovascular complication in patients.The aim of this study is to determine the prevalence and patterns of dyslipidemia in patients with T2DM in Tripura,in 2021.**Methodology:** A cross-sectional study was conducted in a randomly selected eligible patients from the diabetic OPD of AGMC & GBP Hospital during the period from January 2021 to December 2021.A well structured questionnaire and blood investigation for lipid profile and blood sugar were the tools of data collection from 480 randomly selected T2DM patients registered in the diabetic OPD.**Results:** Prevalence of dyslipidemia in T2DM patients was 85%, prevalence of dyslipidemia in males and females was 86% and 84% respectively.High serum cholesterol level seen in 52.5%, low serum HDL-C level seen in 22.5%, high serum triglyceride level seen in 39.2%.Serum LDL-C level above normal range seen in 67.5% patients.So,common patterns of dyslipidemia in this study were LDL-C ,followed by Cholesterol. **Conclusion:** Prevalance of dyslipidemia is very high among T2DM patients in Tripura which is strong risk factor for the development of cardiovascular events.So,this study emphasizes the importance of screening of lipid profile .

Keywords: Diabetes Mellitus (DM), Dyslipidemia, LDL(Low -density lipoprotein), HDL (High – density lipoprotein).

I. INTRODUCTION:

Diabetes mellitus is a chronic metabolic disorder resulting due to reduced insulin secretion,decreased glucose utilization,and increased glucose production[1].Type 2 DM alone accounts for more than 90% of all diagnosed cases of adult diabetes worldwide.Type 2 DM frequently goes undiagnosed for many years because hyperglycemia develops gradually and at earlier stage is often not severe [2].Individuals with type 2 DM are at increased risk of developing macrovascular and microvascular complications [3,4].Type 2 DM increases two to four fold risk for the development of cardiovascular disease(CVD) or stroke compared to general population [5].It is well established that dyslipidemia is a major risk factor for macrovascular complications in patients with type 2 DM [6-9].Approximately 80% of death in patients with diabetes is attributable to cardiovascular disease.Asian Indians have an increased risk of cardiovascular arterial disease(CAD) [10].The glycated hemoglobin is considered as the gold standard in the assessment and monitoring of glycemic control in patients with type 2 DM[11]. Poor glycemic control characterized by elevated glycated hemoglobin(HbA1c) level,further aggravates the risk of CVD in these patients[12].Dyslipidemia in T2DM has been attributed to insulin resistance ,characterized by atherogenic triad of low HDL-C, high triglyceride(TG) and increased LDL-C levels[13].Dyslipidemia ,an established and modifiable risk factor for CVD,is strikingly common in patients with T2DM[14].

Aim & Objectives: The aim and objectives of this study is to determine the prevalence and patterns of dyslipidemia in patients with type 2 DM in Tripura,in 2021.

Inclusion and Exclusion Criteria: All medically diagnosed T2DM patients above 40 years of age of both sex (male and female) who registered on diabetic OPD of AGMC & GBP Hospital are included in this study.Patients who already taking lipid lowering drugs and pregnant women are excluded.

Methodology: A cross-sectional study was conducted in a randomly selected eligible patients from the diabetic OPD of AGMC & GBP Hospital. A sample size of 480 eligible patients was statistically calculated based on an expected proportion of 34.29%[15-16] .A well structured questionnaire was the tool for data collection from patients.Samples of blood were collected from patients by well trained medical

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person.Appropriate statistical tests are used for data analysis.Statistical methods used are mean,median,standard deviation,range,t-test,chi-square test.A cut-off point of 0.05 was determined for significance level

Sampling Method:
Type of study: Observational study
Study design: Cross-sectional
Study setting: Study was conducted in the diabetic OPD of AGMC & GBP Hospital
Study duration: 1 year(1st Jan 2021-31st Dec 2021)
Sample size: 480
Sampling method: Simple random sampling(by lottery method)

II. RESULTS:

Characteristics	Frequency	Percentage(%)
Age- 41 to 50 years	188	39.2
-51 to 60 years	172	35.8
->60 years	120	25
Gender- Male	236	49.2
-Female	244	50.8
Occupation-Government	116	24.2
-Private work	112	23.4
-Unemployed	252	52.4
-Illiterate	144	30
-Read & Write	104	21.7
Educational status-Primary	132	27.5
-Secondary	56	11.7
BMI-Average (18-24)	202	39.2
-Over weight(25-30)	187	35.8
-Obese(>30)	135	25

Table 1: Demographic characteristics in the studied T2DM patients attending diabetic OPD of AGMC & GBP Hospital.

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Characteristics	Dyslipidemia(+)	Dyslipidemia(-)	Total (480)	Prevalance	P-value
Sex-Male	204	32	236	86%	
-Female	204	40	244	84%	0.43
-Total	408	72	480	85%	
Age-(41-54 years)	204	32	236	86%	
->54 years	204	40	244	84%	0.43
-Total	408	72	480	85%	
BMI-Average-	156	32	188	82%	
-over weight/obese	252	40	292	86%	0.532
-Total	408	72	480	85%	
Duration of DM					
-<10 YEARS	316	64	380	83%	
->10 YEARS	92	08	100	92%	0.222
-Total	408	72	480	85%	

Table 2: Prevalance of dyslipidemia among T2DM by gender in Tripura.

Lipid indicator	Mean± SD	Abnormal value	Normal(%)	Abnormal (%)
Cholesterol	204.66+49.39	≥ 200	47.5	52.5
Triglyceride	143.52±70.57	≥ 150	60.8	39.2
HDL	50.70±15.97	<40	77.5	22.5
LDL	124.77±42.64	>100	32.5	67.5
FBS	184.5O±38.18	>100	19.2	80.8

Table 3: Indicators of lipid profile among T2DM patients.

III. DISCUSSION:

Patients with DM have a high prevalence of atherosclerosis and coronary artery disease(CAD).The major risk factors in DM are hyperglycemia,dyslipidemia and hypertension. Various patterns of lipid abnormalities are seen in patients with T2DM.The overall prevalence of diabetic dyslipidemia in this study was found to be 85%.Diabetic dyslipidemia consists of elevated TGs,low HDL-C,high LDL-C. In this study commonest lipid abnormality being elevated LDL-C(67.5%) followed by low HDL-C(25%). Four independent factors were investigated in this study regardingdyslipidemia,age,sex,BMI and duration of DM;none of them appear any significant association with dyslipidemia in T2DM.The variation in the patterns of dyslipidemia in various countries may be the result of variations in the dietary habits.

IV. CONCLUSION:

High prevalence of dyslipidemia among T2DM in Tripura were observed and the common patterns of dyslipidemia is LDL-C followed by Cholesterol.So,this study emphasizes the importance of screening of lipid profile as these abnormalities may lead to development of cardiovascular diseases.Hence we recommend T2DM patient should undergo routine monitoring of blood sugar and lipid profile ,so that any abnormalities can be identified and preventive measures along with interventions can be initiated at the earliest.

Limitation: This study is restricted to patients over 40 years of age ,so patients under 40 years of age including children are not included in this study.Hope this limitation is further covered in future studies.

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