To Study the Pattern and Prevalence of Lipid Profile Abnormality in Newly Diagnosed Type 2 Diabetes Mellitus

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Abstract

Background: Diabetes is one of the commonest chronic non communicable disease affecting the society at large both in developing and developed countries. Present study aimed to study the Pattern and Prevalence of lipid profile abnormality in newly diagnosed type 2 diabetes mellitus. **Subjects and Methods:** In this study, 100 newly diagnosed cases of type 2 diabetes mellitus patients were evaluated. A cross section of both male and female diabetes patients diagnosed within the last 3 months (new onset) was taken into study. A detailed history, clinical examination and relevant investigations were performed. Collected data were analysed by using appropriate software. **Results:** In our study 60% were male and 40% were female. Majority of cases were in the age group of 46-55 years, followed by in age group 56-65 years. Dyslipidemia was present in 36.66% of male and 35 % of female. Highest prevalence of dyslipidemia was present in 56 -65 age group. Hypertriglyceridemia was present in 33.33% of cases, Hypertriglyceridemia with low HDL-C was present in 33.33 % of cases, Hypertriglyceridemia with low HDL-C and low LDL –C was present in 13.88% of cases while 19.44 % were having other mixed pattern of dyslipidemia. **Conclusion:** Endeavour should be made to control hyperglycemia and hyperlipidia tightly by appropriate therapeutic measures so that the occurrence and worsening of complications could be mitigated.

Keywords: Dyslipidemia, hyperglycemia, lipid profile.

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Introduction

Diabetes Mellitus (D.M.) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia.[1] It results from a defect in insulin secretion and/or insulin action, which results in hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism.[2]

Diabetes is one of the commonest chronic non communicable disease affecting the society at large both in developing and developed countries.

As per the 8th edition of International Diabetes Federation Atlas (2017) it is estimated that there are currently 451 million people(age 18-99) with diabetes worldwide and this number is set to increase to 693 million by the year 2045. The major proportion of this increase will occur in developing countries of the world like India.[3]

India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "Diabetes Capital of the World".

Type 2 diabetes is accompanied by a high prevalence of associated disorders like the various components of the metabolic syndrome like hypertension, dyslipidemia and obesity; micro vascular complications like retinopathy (Rt), nephropathy (Np), neuropathy (Nu) and macro vascular complications like coronary artery disease, peripheral vascular disease and cerebrovascular disease resulting in significantly high morbidity and mortality.[4-9] The chronic complications of diabetes mellitus translate into a significant economic burden on individuals and community at large.[9]

Prior to the onset of diabetes, many patients already show metabolic abnormalities, such as dyslipidemia, further contributing to the development of complications.[10]

Type2 diabetes mellitus is associated with the development of premature arteriosclerosis and a higher cardiovascular morbidity and mortality.[11-13] Diabetic dyslipidemia is believed to play an important role in the pathogenesis of accelerated atherosclerosis in this condition.[14,15] The predominant lipid abnormalities seen in diabetes mellitus are an elevated serum triglyceride (Tg) level and a low HDL-C level.[16] Several studies have found a significant association of fasting hypertriglyceridemia and coronary artery disease(CAD) in diabetes mellitus.[15,17,18] Present study aimed to study the Pattern and Prevalence of lipid profile abnormality in newly diagnosed type 2 diabetes mellitus.

Subjects and Methods

In this study, 100 newly diagnosed cases of type 2 diabetes mellitus patients were evaluated. A cross section of both male and female diabetes patients diagnosed within the last 3 months (new onset) attending the general medicine indoor

and outpatient department and other clinical departments of Katihar Medical College, Katihar was taken into study.

A detailed history, clinical examination and relevant investigations were performed as follows:-

History

Age, sex and duration of diabetes were recorded. Family history of diabetes and personal medical history was enquired. History of symptoms suggestive of diabetic complications like visual problems, abnormal sensory and motor complaints, decreased urine output and bowel and bladder abnormalities was taken.

Inclusion Criteria
Patients with:
- Newly diagnosed case of type 2 diabetes mellitus
- Cases within 3 months of diagnosis

Exclusion Criteria
Patients with:
- Type 1 diabetes mellitus
- Diagnosed type 2 diabetes of more than 3 months duration
- Previous history of any vascular disease
- End stage renal disease
- Preexisting neurological disease including stroke, dementia
- History of nephrotoxic, neurotoxic or oculotoxic drug use

Biochemical Analysis
Biochemical analysis of the following were done in the department of Biochemistry

American Diabetes Association Guidelines
Fasting and/or 2 hr post 75 oral anhydrous glucose plasma glucose level was estimated by enzymatic glucose oxidation method. A basal FPG>126 mg/dl, and a plasma glucose >200 mg/dl at 2hr post 75 glucose confirmed on a second occasion was diagnostic of diabetes.

Glycosylated haemoglobin (HbA1c) was estimated by ion exchange chromatography. In diabetes mellitus the value is ≥ 6.5. It gives an idea of the plasma glucose control on the preceding 3 months.

Lipid Profile: Blood sample was taken after 12 hours fast and the estimation of following was done – total cholesterol level, triglyceride level, HDL (high density lipoprotein) cholesterol level, LDL (low density lipoprotein) cholesterol level, VLDL (very low density lipoprotein) cholesterol level.

Statistical Analysis
Data was tabulated into a master chart and mean value and standard deviation was calculated for each variable, p value was calculated using t-test and fischer exact test with the help of standard statistical software. Pearson correlation coefficient was seen to see correlation between variables.

Results

Hypertriglyceridemia was present in 33.33% of cases, Hypertriglyceridemia with low HDL-C was present in 33.33 % of cases, Hypertriglyceridemia with low HDL-C and low LDL –C was present in 13.88% of cases while 19.44 % were having other mixed pattern of dyslipidemia.

Table 1: Sex Wise Distribution of Population

Sex	Number	%Age
Male	60	60
Female	40	40

In our study 60% were male and 40% were female

Table 2: Showing Distribution of Population in Different Age Group

Age Groups (In Yrs)	Number	% AGE
36-45	14	14
46-55	51	51
56-65	35	35

Majority of cases were in the age group of 46-55 years, followed by in age group 56-65 years.

Table 3: Showing Male and Female Distribution in Different Age Groups

Age Groups (In Yrs)	Male	Female
36-45	7	7
46-55	31	20
56-65	22	13

Table 4: Showing Prevalence of Dyslipidemia in Male and Female

SEX	↑TG	↑TG+ ↓HDL	↑TG +↓HDL+ ↑LDL	MIXED	TOTAL	PERCENT DYSLIPIDEMIA
Male (N=60)	6	9	3	4	22	36.66%
Female (N=40)	6	3	2	3	14	35 %

Dyslipidemia was present in 36.66% of male and 35 % of female

Table 5: Showing Prevalence of Dyslipidemia in Different Age Group

AGE GROUPS (in yrs)	↑TG	↑TG+ ↓HDL	↑TG +↓HDL +↑LDL	MIXED	TOTAL	PERCENTAGE
36-45 (N=14)	1	2	0	1	4	28.57
46-55 (N=51)	8	5	2	3	18	35.29
56-65 (N=35)	3	5	3	3	14	40

Highest prevalence of dyslipidemia was present in 56 -65 age group.

Table 6: Showing Pattern of Dyslipidemia among Dyslipidemics

Pattern Of Dyslipidemia	Number Of Patients (N=36)	Percentage Of Total Dyslipidemia
↑TG	12	33.33
↑TG+↓HDL	12	33.33
↑TG+↓HDL+↑LDL	5	13.88
OTHERS	7	19.44

Discussion

The present cross sectional study was carried out on 100 consecutive patients of type 2 diabetes who were diagnosed recently (duration less than 3 months). The mean age at diagnosis was found to be 53.7 years. This signifies that in our hospital, diabetic patients are presenting late. Among the newly diagnosed patients 60 were male and 40 patients were female.

Age wise analysis of the patients reveals that most of the patient were in age group 46-55 yrs n =51 (51%) , followed by in age group 56 – 65 n =35 (35%) and least number in 35 – 45 n= 14 (14%) .This corroborates with the work done by RAMACHANDRA et al,[19] which shows that in developing countries, the majority of diabetes patients are in the age range of 45-64 years whereas in the developed countries are aged >65 years .In our study 86 % of population was in age group 46 – 65yrs.

36 % of newly diagnosed diabetics were having one or other type of dyslipidemia. This agrees well with the work of GUPTA et al.[20] which reported the prevalence of dyslipidemia above 30%, and CINDI (complication in newly diagnosed diabetes in India) 21 study which reported prevalence of dyslipidemia around 34%. Dyslipidemia was seen in 22 (36.66%) of male and 14 (35%) of female at the time of diagnosis.

The classical diabetic dyslipidemia that is increased TG with reduced HDL with or without elevated LDL was present in 17 (47.22%) of patients and is the commonest pattern identified in our study, this is followed by isolated increased TG seen in 12 (33.33%) of patients, 7 (19.44%) were having other mixed pattern of dyslipidemia.

Conclusion

The study was carried out with the intent to assess the prevalence of diabetic complications in the newly diagnosed type 2 diabetics and also to study the prevalence of lipid profile abnormalities in these patients and to assess the pattern of dyslipidemia in them.

Dyslipidemia was present in 36 % of newly diagnosed type 2 diabetics ,and the most common pattern of dyslipidemia was increased TG with reduced HDL –C   with or without elevated LDL-C   present in 47.22 %of patients, however isolated hypertriglyceridemia was also fairly common seen in 33.33% of patients. Dyslipidemia was found to be significantly associated with nephropathy.

Endeavour should be made to control hyperglycemia and hyperlipidia tightly by appropriate therapeutic measures so that the occurrence and worsening of complications could be mitigated.

There is an urgent need for concerted efforts by Government and Non-governmental sectors to implement national programmes aimed at prevention, management and surveillance of the disease.

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