

## **7 STUDY OF DYSLIPIDEMIA AND ABNORMAL LIPID PROFILE IN DIABETES MELLITUS PATIENTS AND ITS ASSOCIATION WITH INCREASED MORBIDITY. Authors Dr Ajay Rathod, DrTejas Shah**

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### **ABSTRACT:**

**Introduction:** Diabetes Mellitus is a heterogeneous group of metabolic disorder characterized by chronic hyperglycemia with disturbance of carbohydrate, fat and protein metabolism resulting from defect in insulin secretion, insulin action or both. The two broad categories of DM are Type 1 & Type 2. Due to paucity of dramatic symptoms, poor health awareness & the prevailing socio-economic condition type 2 diabetes frequently goes undiagnosed for many years and such patients are at increased risk of developing macro-vascular and micro-vascular complications(1). This was clearly seen in UK Prospective Diabetes Study where 50% of patients had diabetic complications at presentation (3). Lipid abnormalities play an important role in causation of diabetic atherosclerosis (4, 5) and contribute significantly to complication of diabetes.

**Materials & Methods:** A prospective analytical study of 200 patients was undertaken at Department of Internal Medicine, AMC MET MMC Ahmedabad. Prior approval by IRB of AMC MET MMC was taken. Patients presenting to OPD were analyzed in terms of Age, Sex & Obesity related to dyslipidemia & data analyzed using Paired T test with reference study.

**Observations:** Mean age of study population was 54 yrs. Male patients were 54.55 yrs & females were 54.80 yrs mean age. Abnormal HDL 80%, LDL 57%, VLCL 56%, Cholesterol in 37% were found. 66% of pts had BMI > 25 & were classified as obese.

**Conclusions:** Majority of patients were 40-60 yrs age group which is a high risk age group for development of atherosclerosis & cerebrovascular events & of them >50% of pts were having altered lipid profile which is a significant risk factor for morbidities related to diabetes. Hence control of dyslipidemia in diabetics with lipid lowering agents should be given due consideration when planning a treatment regimen.

**KEYWORDS:** Dyslipidemia, Diabetes Mellitus, Lipoproteins, Abnormal Lipid Profile.

**INTRODUCTION:** Diabetes is a growing health problem throughout the world. Diabetes is now among the five leading causes of death due to disease in most countries (2). It was estimated that 194 million people were likely to have diabetes globally in 2003 i.e. about 5.1 % of the world population. By the year 2025, the total number of people with diabetes is projected to reach 330 million worldwide. The region most likely to experience the main burst of epidemic is Asia (2). Diabetes has emerged as a major healthcare problem in India. According to Diabetes Atlas published by the International Diabetes Federation (IDF), there were an estimated 40 million persons with diabetes in India in 2007 and this number is predicted to rise to almost 70 million people by 2025. Patients with type 2 diabetes usually

have insulin resistance and relative rather than absolute insulin deficiency. At the time of diagnosis and often throughout their lifetime these patients don't need insulin treatment to survive, although ultimately it may be required for glycemic control. This form of diabetes is associated with progressive  $\beta$  cell failure with increasing duration of diabetes. In India it seems to occur a decade earlier as compared to the West. Due to paucity of dramatic symptoms, poor health awareness & the prevailing socio-economic condition type 2 diabetes frequently goes undiagnosed for many years and such patients are at increased risk of developing macro-vascular and micro-vascular complications(1). This was clearly seen in UK Prospective Diabetes Study where 50% of patients had diabetic complications at presentation (3). Lipid abnormalities play an important role in causation of diabetic atherosclerosis (4, 5) and contribute significantly to complication of diabetes. Lipid abnormalities in patients with diabetes are likely to play important role in the development of atherogenesis. A study was undertaken at AMC MET MMC Ahmedabad from Sept 2016 to March 2017 to assess the incidence of dyslipidemia in diabetes mellitus patients presenting to Dept of internal medicine and whether age and sex of the patient affect the extent of dyslipidemia and its effects on morbidity due to diabetes mellitus.

**AIMS & OBJECTIVES:** A study of 200 patients was conducted at Department of Internal Medicine, AMC MET MMC Ahmedabad from Sept 2016 to March 2017 with following objectives.

To study the prevalence of lipid abnormalities in diabetic patients.

To identify and characterize lipid and lipoprotein abnormalities associated with diabetic patients.

To compare dyslipidemia in male and female diabetics.

To compare dyslipidemia in obese and non-obese diabetics.

**MATERIALS & METHODS:** A total of 200 patients presenting to OPD of Dept of Internal Medicine during period Sept 2016 to March 2017 were included in the study. Study was presented at biennial meeting of Institutional Review Board and approved.

**INCLUSION CRITERIA FOR STUDY:**

1. Patients with established diabetes mellitus diagnosed as per WHO criteria.(76)
  - Symptoms of diabetes: RBS  $\geq$  200 mg/dl or
  - FBS  $\geq$  126 mg/dl or
  - Two hour plasma glucose  $\geq$  200 mg/dl during oral GTT.
2. Age of patients was 12 years onward.

Systemic disease like hypertension, chronic renal failure, nephritic syndrome, myxoedema, systemic lupus erythematosus were excluded from the study on the basis of history, clinical examination and relevant previous investigations. Pregnant females and patients with various endocrinal disorders were excluded. Patients were screened for obesity by BMI. BMI  $\geq$  25 was considered as obese.

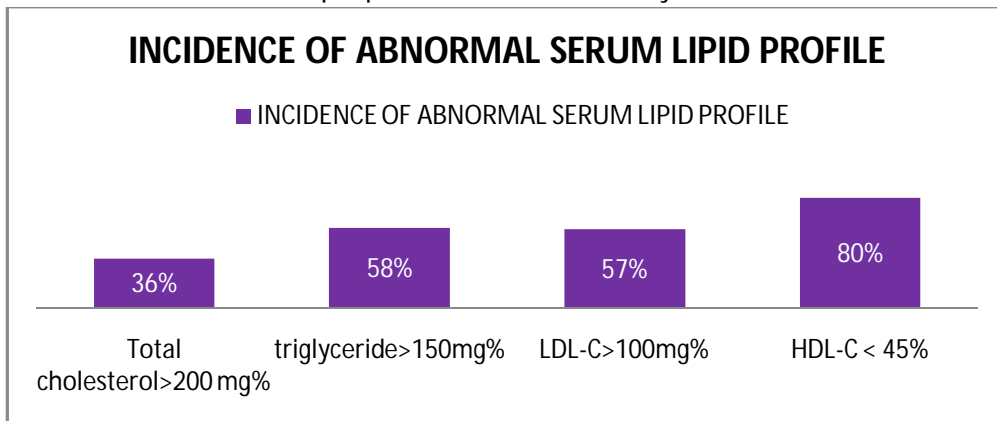
All patients were subjected to following laboratory investigation-

- a) Fasting lipid profile
- b) Fasting and postprandial blood sugar levels.
- c) S. Cholesterol
- d) S. Triglyceride
- e) S. HDL
- f) VLDL- C
- e) S. LDL

Cut off values for abnormal lipid levels were taken as Adult treatment panel-3 guidelines. Data was compiled and analyzed using multi variate and bi variate analysis percentages.

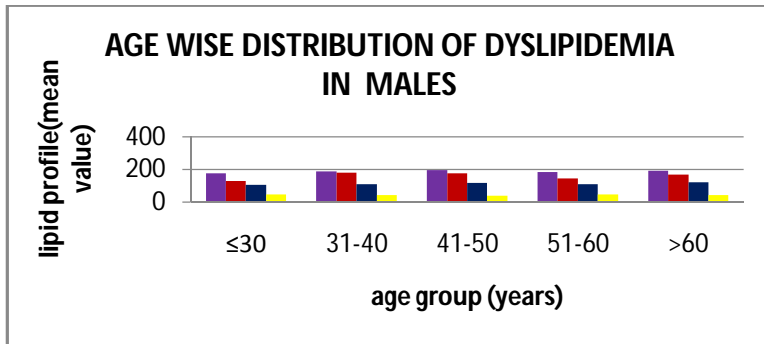
**OBSERVATIONS:**

1. Mean age of study population was 54 yrs. Mean age of male patients was 54.55 yrs& females was 54.80 yrs. Incidence increased from 5th decade(19%) and become maximum in 6th and 7th decade(26% each). As compared to males, incidence of diabetes in female is low(17.64%) in 5th decade but rises to 29.41% in 6th decade and 26.41% in 7th decade similar to male incidence, as female hormonal advantage over males is gone in this age group due to menopausal state. Menopause promotes the development of android pattern obesity which increases insulin resistance and subsequent increase in incidence of diabetes. Incidence in individuals 70 years or older did not increase further, most likely as a result of higher mortality in this age group diabetes than in those without diabetes.
2. Distribution of abnormal lipid profile values in our study:

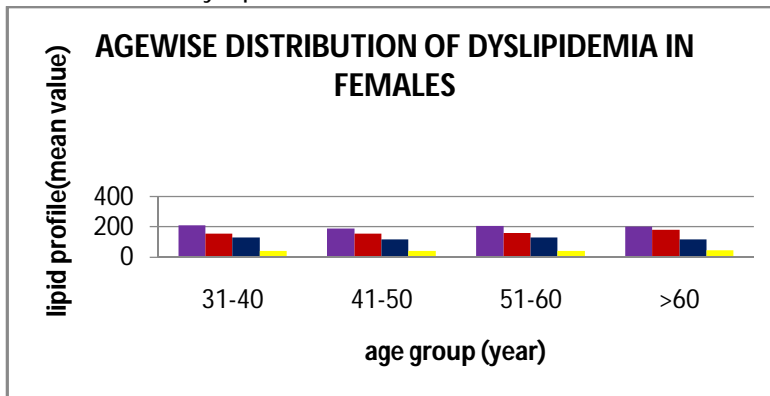


Most common dyslipidemia observed in present study was low HDL cholesterol followed by hypertriglyceridemia and increased LDL cholesterol which is comparable with reference studies. 28 patients (14% of study population) had normal levels of four lipid components which shows that dyslipidemia is significant finding in present study (86% of study population).

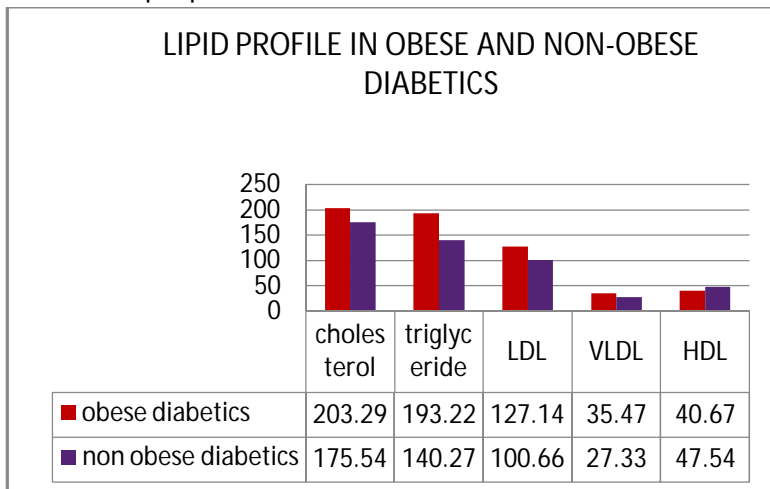
3. Distribution of Dyslipidemia in Males:



4. Distribution of Dyslipidemia in Females:



5. Abnormal lipid profile in Obese & Non-Obese individuals:



**CONCLUSIONS:** The present study attempts to study the abnormality in lipid profile in diabetes mellitus patients. The majority (87%) of patients were in the age group 40-70 years. Mean age of patient was 54 years. The male to female ratio was 1.94:1. Incidence of diabetes in females is lower than males due to various reasons like hormonal make-up, absence of smoking, fat conscious habits and less incidence of insulin resistance in premenopausal women. Incidence of diabetes in females is low in 5th decade. It is equivalent to male in 6th and 7th decade as female hormonal advantage over males is gone in this age group due to menopausal state. BMI  $\geq 25$  was in 66% of patients. Obese diabetics when compared to non-obese diabetics, showed significant increase in the level of serum total cholesterol, serum triglycerides, serum LDL-cholesterol and

decreased in the level of serum HDL cholesterol. All lipid component levels except HDL were significantly higher in obese diabetics than non-obese. Thus obesity is a major risk factor for diabetic dyslipidemia.

Abnormal lipid profile was the major focus of study. 86% of patients were having abnormal lipid levels.

High total cholesterol was found in 34% of patients.

High triglyceride level was found in 58% of patients.

High LDL cholesterol was found in 57% of patients.

Low HDL cholesterol was found in 80% of patients.

Thus to conclude, dyslipidemia is significant finding in diabetic patients. Realizing the most of the diabetics have a high probability of developing cardiovascular and cerebrovascular disease, it is essential that lipid abnormality in diabetics especially increased triglycerides, low HDL-C and abnormal LDL cholesterol should be properly taken care of, with good glycemic control, lifestyle modification and pharmacotherapy, to decrease morbidity and mortality in diabetes.

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