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Level of Micro Albuminuria and Triglyceride in Type 2 Diabetes Mellitus

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Abstract: Experimental and clinical studies have shown a strong association between hypertriglyceridemia and diabetic nephropathy. High triglyceride variability affects the microalbuminuria
Keywords*; *microalbuminuria, Type 2 diabetes mellitus, Triglycerides, IDDM, MODY

I. INTRODUCTION

Diabetes mellitus is a chronic disease due to disorder of carbohydrate metabolism and it is a common disease of human. The disease is commonly inherited as an autosomal recessive trait. The cause of diabetes mellitus, is due to deficiency or diminished effectiveness of insulin, resulting in hypoglycaemia and glycosuria. Diabetes mellitus (DM), the most common endocrine disease. It is a metabolic syndrome, characterized by chronic hyperglycaemia and disturbances of carbohydrate, fat and protein metabolism associated with absolute or relative deficiency in insulin secretion and/or insulin action. The two main types of diabetes are type I or Insulin Dependent Diabetes Mellitus (IDDM) and type II or Non-Insulin Dependent Diabetes Mellitus (NIDDM). The various complications of diabetes mellitus are: Peripheral neuropathy; Micro vascular disease and related abnormalities, which include diabetic nephropathy and diabetic retinopathy; Macro vascular disease with the influence of lipids, which include atherosclerosis, ischemic heart disease and cerebral stroke. The major cause of vascular dysfunction is hyperglycaemia. Diabetic patients with poor glycaemic control and longer duration of disease are more prone to develop various complications.

There are two type clinical types in diabetes mellitus:

A. Juvenile' onset diabetes:Type 1,which is insulin dependent (IDDM)
B. Maturity'onset diabetes: Type 2,which is non-insulin dependent (NIDDM)

Type 1 diabetes mellitus formerly known as insulin dependent diabetes mellitus. About 5% of total diabetic patients are of type 1.It is sub classified as Immune mediated and Idiopathic . Type 2 diabetes mellitus is known as non-insulin dependent diabetes mellitus. Most of the patients belong to this type. Here circulating insulin level is normal or mildly elevated or slightly decreased. It is further classified as Obese and Non-obese.
95% of the patients belong to this group. The disease is due to the decreased biological response to insulin, otherwise called insulin resistance. So there is a relative insulin deficiency. Type 2 diabetes mellitus commonly seen in individuals above 40 years. Insulin resistance develops as a consequence of excess accumulation of fat in liver and skeletal muscle. Diabetic nephropathy is a complication of type 1 and type 2 diabetes caused by damage to the kidney's delicate filtering system. Due to damage to kidney's filtering system it is characterised by micro albuminuria. Micro albuminuria is also called minimal albuminuria. It is an early indication of nephropathy in patients with diabetes mellitus and hypertension. All patients who are known diabetes and hypertensive should be screened for micro albuminuria.It is expressed as albumin-creatinine ratio. Normal ratio being;

Males : <23mg/g of creatinine
Females :< 32mg/g of creatinine

Patients showing higher values more than one occasion is considered to have micro albuminuria. Triglycerides are fat molecule that make up most of our body fat and fat found in food. Along with cholesterol, they are one of the lipid that circulate in blood. Elevated levels of triglyceride is known as hypertriglyceridemia. In type 2 diabetes mellitus the level of triglyceride is high. About 80% of people with diabetes struggle with this problem.

II. AIM

To assess the relationship between microalbuminuria and triglyceride in type 2 diabetes mellitus

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III. REVIEW OF LITERATURE

A. *Diabetes Mellitus*

Diabetes mellitus is a disorder of carbohydrate metabolism characterised by impaired ability of the body to produce or respond to insulin and thereby maintain proper levels of sugar (glucose) in the blood. Diabetes is a major cause of morbidity or mortality, though these outcomes are not due to immediate effect of the disorder. They are instead related to the diseases that develop as a result of chronic diabetes mellitus. These include diseases of large blood vessels (macro vascular disease, including coronary heart disease and peripheral arterial disease) and small blood vessels (microvascular disease, including retinal and renal vascular disease) as well as the disease of the nerves. Insulin is a hormone secreted by beta cells, which are located within clusters of cells in the pancreas called the islets of Langerhans. Insulin's role in the body is to trigger cells to take up glucose so that the cells can use this energy-yielding sugar. Patients with diabetes may have dysfunctional beta cells, resulting in decreased insulin secretion, or their muscle and adipose cells may be resistant to the effects of insulin, resulting in a decreased ability of these cells to take up and metabolize glucose. In both cases, the levels of glucose in the blood increase, causing hyperglycaemia (high blood sugar). As glucose accumulates in the blood, excess levels of this sugar are excreted in the urine. Because of greater amounts of glucose in the urine, more water is excreted with it, causing an increase in urinary volume and frequency of urination as well as thirst. Other symptoms of diabetes include itching, hunger, weight loss, and weakness. Diabetes mellitus is mainly classified into two:Type 1 or insulin dependent diabetes mellitus (IDDM) & Type 2 or non-insulin dependent diabetes mellitus (NIDDM)

1) Type 1 diabetes mellitus (T1DM) is a chronic, lifelong disorder of glucose homeostasis characterized by autoimmune destruction of the insulin-producing pancreatic b-cell, leading progressively to insulin deficiency and resultant hyperglycaemia. Type 1 diabetes, previously called insulin-dependent diabetes mellitus (IDDM) or juvenileonset diabetes, may account for 5 percent to 10 percent of all diagnosed cases of diabetes. Risk factors are less well defined for type 1 diabetes develop in children or adolescents, but about 20 percent of new patients are adults. The frequency of type 1 diabetes varies widely in different Type 1 diabetes than for Type 2 diabetes, but autoimmune, genetic, and environmental factors are involved in the development of this type of diabetes.Type 1 diabetes accounts for about 5 to 10 percent of cases of diabetes. Type 1 diabetes is usually caused by autoimmune destruction of the islets of Langerhans of the pancreas. Patients with type 1 diabetes have serum antibodies to several components of the islets of Langerhans, including antibodies to insulin itself. The antibodies are often present for several years before the onset of diabetes, and their presence may be associated with a decrease in insulin secretion. Some patients with type 1 diabetes have genetic variations associated with the human leukocyte antigen (HLA) complex, which is involved in presenting antigens to immune cells and initiating the production of antibodies that attack the body's own cells (autoantibodies). However, the actual destruction of the islets of Langerhans is thought to be caused by immune cells sensitized in some way to components of islet tissue rather than to the production of autoantibodies. In general, 2 to 5 percent of children whose mother or father has type 1 diabetes will also develop type 1 diabetes

2) Type 2 diabetes, although less common in very young children, can occur when not enough insulin is produced or it is not working properly. As a result, glucose can accumulate in the bloodstream. The condition can often be managed through a change in diet, increasing exercise and maintaining a healthy weight, although some patients may require diabetes medication - such as metformin - or insulin therapy. Type 2 diabetes prevention is possible by adopting some healthy lifestyle habits and paying attention to specific preventable diabetes complications associated with this disease. Maintaining a healthy diet is important for everyone, but it is especially important for people with diabetes.

It is characterized by insulin insensitivity as a result of insulin resistance, declining insulin production, and eventual pancreatic beta-cell failure. This leads to a decrease in glucose transport into the liver, muscle cells, and fat cells. There is an increase in the breakdown of fat with hyperglycaemia. The involvement of impaired alpha-cell function has recently been recognized in the pathophysiology of type 2 DM

IV. MATERIALS AND METHOD

1) Inclusion Criteria

Known cases of type 2 diabetes mellitus.
Age between 40-70 year.

2) Exclusion Criteria

Patient with type 1 diabetes mellitus.
Patient with insulin therapy.
Pregnancy.

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3) Blood Collection: Venipuncture is the accepted method for blood collection.

4) Automated Machine: COBAS*6000 ANALYZER SERIES

It is a fully automated clinical biochemistry analyser based on the principle of photometry, it measures light transmittance of varying lengths. When a beam of monochromatic light passes through a coloured solution, the coloured substance of the solution absorb a part of the incident light hence the intensity of the transmitted light is always less than the incident light.

Fasting blood sugar estimation by God-Pod method

ESTIMATION OF TRIGLYCERIDE

The Cobas 6000 analyzer is optimized for workloads using a combination of photometric and ion-selective electrode (ISE) determinations (c501 module), and electro chemiluminescence (ECL) technology in the immunoassay analysis module (e601 module)

V. RESULT

A total of 50 samples collected from diabetic patients, from that a significant rise of microalbuminuria and triglyceride level were observed.

PARAMETERS	ABNORMAL	NORMAL
MICROALBUMINURIA	45	5
TRIGLYCERIDE	45	5

VI. CONCLUSION

I conclude , significant rise in the levels of micro albuminuria and triglyceride was observed in type -2 diabetes mellitus cases

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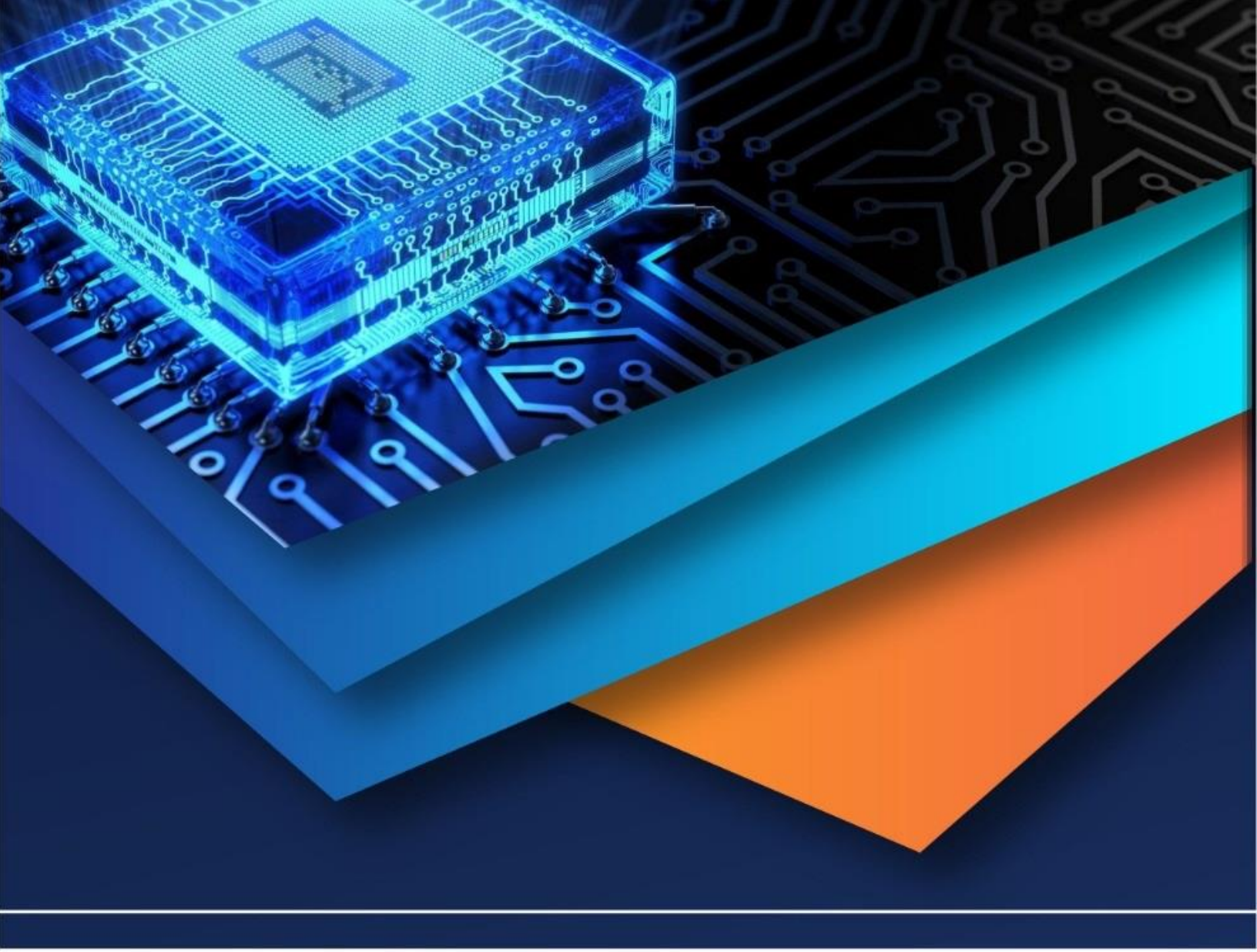

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