INTRODUCTION

Diabetes mellitus is a group of metabolic disease characterized by elevated blood glucose levels – hyperglycemia. This defect in the insulin secretion, action or both. Insulin is a hormone secreted from the beta cells of pancreas which makes the utilization of glucose. Chronic hyperglycemia may leads to the development of microvascular and macrovascular complications leading to blindness, visual impairment, blindness, kidney, nerve, heart disease and stroke. [1]

Classification of diabetes mellitus is based in etiology and clinical presentations they are four types they are [2]

- Type 1 diabetes mellitus
- Type 2 diabetes mellitus
- Gestational diabetes
- Other specific types

The most common risk factors involved in type 2 diabetes mellitus are due to increase in duration, hypertension, poor metabolic control, smoking, obesity and hyperlipidemia more prone to develop diabetic complications. [3]

Prevalence of type 2 diabetes mellitus is due to increase with increased in obesity and overweight [4].

Gene

Sunita S. (2015) [5] there are many genes play an important role in the development of type 2 diabetes mellitus. Among them most common genes are Transcription factor 7-like 2 (TCF7L2) genes.

Transcription factor 7-like 2 (TCF7L2) genes

TCF7L2 gene a transcription gene play important role in WNT signaling pathway causing vartions in cell linkage and organs. [6]
**Cytogenetic Location:** 10q25.2-q25.3, which is the long (q) arm of chromosome 10 between positions 25.2 and 25.3 Molecular Location: base pairs 112,950,219 to 113,167,678 on chromosome 10. [7]

In type 2 diabetes mellitus TCF7L2 gene play an important role in adipogenesis, myogenesis, and pancreatic islet development, beta-cell survival and insulin secretory granule function [8,9] and regulates a protein proglucagon and the glucagon-like peptides GLP-1 and GLP-2; these peptides play a role in postprandial insulin secretion. [10]

Polymorphism may leads to impaired insulin secretion, glucose production and tolerance by direct effects on pancreatic islet beta cells. [11,12], decreases proinsulin and elevated levels of gastric inhibitory peptide and glycated hemoglobin (HbA1c) can be observed in normoglycemic individuals with TCF7L2 polymorphisms before the onset of type 2 diabetes [13,14]

Management of type 2 diabetes mellitus can be done by changing life style, diet, weight control by maintaining the blood pressure and blood glucose levels this is the first line defense against type 2 diabetes mellitus. If patient continuous to show increase of blood glucose level and glycated hemoglobin (HbA1c >6,0) medication with oral antidiabetic drugs [15]

Oral anti-diabetic agents are

1) **Biguanides** – reduces gluconeogenesis in liver – metformin
2) **Insulin secretagogues** – stimulates pancreas to secrete insulin – sulfonylureas.
3) **insulin sensitizers** – improve sensitivity of peripheral tissues to insulin – Thialzolidinediones [16]
4) **insulin/insulin analogues** – provides insulin exogenously to from recombinant insulin.
5) **Glucagon like peptide agonist** – Exenatide, liraglutide.
6) **oral dipeptidyl peptidase -4 (DPP-4) inhibitor** – linagliptin, [17,18]
Prevalence’s of Diabetes Mellitus –

Worldwide 415 million people are diabetic and it is expected to rise >642 million by 2040. The Indian statistics showed prevalence is 8.7 and 69.2 million Diabetic cases in adult population. This is according to IDF diabetes atlas 7th edition – 2015 Updates. [19]