REVIEW OF LITERATURE

Diabetes mellitus is a group of metabolic disorder leading to hyperglycemia (rise in blood sugar level) due to defect in insulin secretion, action or both shows a symptoms of polyuria, polydipsia, polyphagia if uncontrolled causes microvascular complications (numbness or tingling in hands or feet, blurred vision and kidney dysfunction) and macrovascular complications (cardiovascular disease). Keecia D [20]

Risk Factors of Causing Diabetes

Sunita S. (2015) [21] there is many genes play an important role in the development of type 2 diabetes mellitus. Among them most common gene was Transcription factor 7-like 2 (TCF7L2) genes.

Transcription Factor 7-Like 2 (TCF7L2) Gene.

Zhang .C (2006) [22] study concluded that TCF7L2 gene is significantly associated with development of type 2 diabetes mellitus among men and women in U.S.

According to Chandak G.R (2007) [23] study concluded that TCF7L2 gene may crucial role in the pathogenesis of type 2 diabetes mellitus by influencing both insulin secretion and release among type 2 diabetes mellitus in Indian population.

Chauhan .G et.al, (2010) [24] study among 5,164 Indian populations with 8 loci PPARG, KCNJ11, TCF7L2, SLC30A8, HHEX, CDKN2A, IGF2BP2, and CDKAL1 having a risk in development of type 2 diabetes mellitus among them TCF7L2 gene is showing higher effective size and also significant association with PPARG gene having strongly association with type 2 diabetes mellitus.

Jyothi K.U et.al (2013) [25] concluded that TCF7L2 gene has a greater risk was confirmed by rs7903146 in development of type 2 diabetes mellitus among Indian and non-Indian population

D. Bodhini et.al. (2015) [26] study shows that rs12255372 polymorphism in TCF7L2 gene is associated with development of diabetes nephropathy in type 2 diabetes mellitus in south indian populations.
According to Ali-ali (2016) study on biochemical parameter changes in newly diagnosed type 2 diabetes mellitus found that there is a significant increase in AST and ALT, decrease in total protein and albumin and increased in blood glucose and uric acid and no change in the cholesterol and urea in newly diagnosed type 2 diabetes mellitus.

According to Uttra K.M (2011) 100 patients with type 2 diabetes were found elevated lipid profile observed by higher triglyceride level, LDL, cholesterol and low HDL levels may lead to higher risk of development of hyperlipidemia.

Hasan C.M.M et al (2014) study on biochemical parameters in controlled and uncontrolled type 2 diabetes patients showing serum cholesterol, high density lipoprotein (HDL) and low density lipoprotein did not show any significance difference between controlled and uncontrolled. serum triglyceride (TG) level are higher, serum Na+ & Cl- were significantly lower, no difference in bicarbonate and potassium ions. in this study uncontrolled diabetes subject are more prone to develop lipid abnormalities and electrolytes imbalance.

Naganjani. V et al (2014) study effect on combination of metformin + Glimepiride vs Metformin + glimepiride vs metformin + Glimepiride + pioglitazone type 2 diabetes mellitus shows that the combination of metformin + glimepiride + pioglitazone group showing a significant fall in fasting, post prandial blood glucose, glycosylated hemoglobin (p < 0.05) with significant rise in high density lipoprotein also there is no significant difference in triglyceride, low density lipoprotein in both groups.

Bakyaraj. R et al (2010) conclude that insulin monotherapy and combination of insulin + OAD and OAD alone shows significant reduction in the fasting and post prandial blood glucose level and is not suitable for patients with fasting blood glucose level more than 200mg/dl and post prandial blood glucose level more than 300mg/dl.

According to Kim et al (2015) study done by making 3 groups – group – 1 metformin, group – 2 teneligliptin + metformin and group – 3 placebo + metformin, observation done by comparing teneligliptin + metformin with placebo + metformin showing combination of teneligliptin + metformin shows decrease in the HbA1c level treatment of the combination shows effective and will tolerated.
Ralph A et al (1995) study on efficacy of metformin is done by making two protocol in protocol 1 combination of placebo + metformin and in protocol 2 combination of metformin + glyburide gives significant lowering of mean fasting and glycosylated hemoglobin. It is also significant associated with decreased in the plasma total and low density lipoprotein cholesterol and triglyceride concentrations. Based on this study combination of both metformin and sulfonylureas are will to improve glycemic control and lipid concentration in patients with type 2 diabetes mellitus in whose diabetic is poorly controlled by diet and sulfonylureas alone.

Riyan M (2016) study on efficacy of teneligliptin done my making 2 groups, group – 1 Teneligliptin 20 mg/day and group – 2 metformin 1 gm/day as this comparison shows reduction in the HbA1c levels and it is effective and well tolerated in type 2 diabetes mellitus. By combination of Teneligliptin and metformin in early stage of treatment helps in delaying pancreatic islet function.

Ghosh et al (2016) study done of teneligliptin as a monotherapy as well as given with combination therapy with anti diabetic drugs show statically significant improvement in the HbA1c, fasting blood glucose and post prandial glucose level and with combination therapy with antidiabetic drugs shows sign of improvement in the glycemic parameters in type 2 diabetes mellitus.

Efficacy safety of Teneligliptin study by Sharma et al (2016) monotherapy and combination therapy with antidiabetic drugs shows an improvement in the clinically significant glycemic control within 12 weeks of type 2 diabetes mellitus.

According to Arif A (2016) study on combination of voglibose + glimepiride + metformin shows significant decrease in glycolated hemoglobin (HbA1c), fasting plasma glucose levels (FPG) and post prandial blood glucose/ hyperglycemia level after 3 months treatment of this triple combination is a might be best option in management of type 2 diabetes mellitus to control both fasting, post prandial blood glucose in indian type 2 diabetes mellitus patients.

Foroutam et al (2016) mentioned in study DDP-4 inhibitors compared with sulfonylureas produces no significant difference in reducing HbA1c, significant decrease in the rate of
hypoglycemia, body weight decreases was observed. DDP 4 inhibitors and sulfonylureas added to metformin monotherapy there is no significant difference was observed.

Kishimoto .M (2013) \[39\] mentioned in study teneligliptin actions on lipid, teneligliptin (DDP-4 inhibitors) reduces postprandial triglycerides levels, reduces postprandial triglycerides and free fatty acids and increases GLP-1 and insulin.

K. Saravanam et al (2015) \[40\] study on combination of glimepiride and metformin shows significant decreases in the serum TC, LDLc TG and significant increase HDL levels at 24 weeks.

According to study done by Murti K etal (2016) \[41\] on combination of voglibose to glimepiride and metformin studied by making two groups, group – 1 metformin + glimepiride and group – 2 metformin + glimepiride + voglibose, showing total cholesterol (TC), Triglycerides (TG) and low density lipoprotein (LDL) is increased in group 1 and decreased in group 2 but there is slightly increased in HDL level in group -1 but in group -2 there is a significantly increased in HDL level. based on this results both groups are showing very significantly controlling the glucose level. as voglibose is showing decreased TC, TG and LDL level but effect was found in increasing HDL level so as combination of metformin + glimepiride + voglibose is the best option for management of hyperglycemia.