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Review on Newer Drug Delivery System for Type2 Diabetes Mellitus

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ABSTRACT:

Sotagliflozin:-

A dual sodium-glucose co-transporter-2 and 1 (SGLT2/1) inhibitor, sotagliflozin is used to treat type 1 (T1D) and type 2 (T2D) diabetes. Similar to other SGLT-2 selective inhibitors that are currently on the market, sotagliflozin inhibits intestine SGLT-1 and renal sodium–glucose co-transporter 2, which determine the substantial excretion of glucose in the urine. This delay in glucose absorption lowers postprandial glucose. Clinical trials with good design have demonstrated that sotagliflozin, either as a monotherapy or as an adjuvant therapy to other anti-hyperglycemic drugs, improves glycated hemoglobin in adult T2D patients and has positive effects on blood pressure and body weight. Even after insulin optimization, similar outcomes have been seen in persons with T1D who were treated with several daily insulin injections or continuous subcutaneous insulin infusion. A phase 3 research that is still in progress is currently assessing

Gliptin:-

Gliptins, sometimes referred to as clinical DPP-IV inhibitors, are a novel family of prospective medication candidates that may one day be used to treat type 2 diabetes forever. Gliptins have so been a focus of study and advancement. When NVP-DPP728 came into focus in 1998, the first clinical proof of concept for efficacy was confirmed as a result of the efforts made to produce effective gliptins. Thus, seventeen gliptins have been discovered throughout the 17 years of intense drug discovery research, which ran from 1998 to 2014. Of these, some are in various stages of clinical studies, but eight gliptins are currently licensed and used in type 2 diabetes therapy.

Key Words:- Sodium-glucose co-transporter-1/2, Diabetes, Inhibitors

Introduction:

Sotagliflozin:-

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Gliptin:-

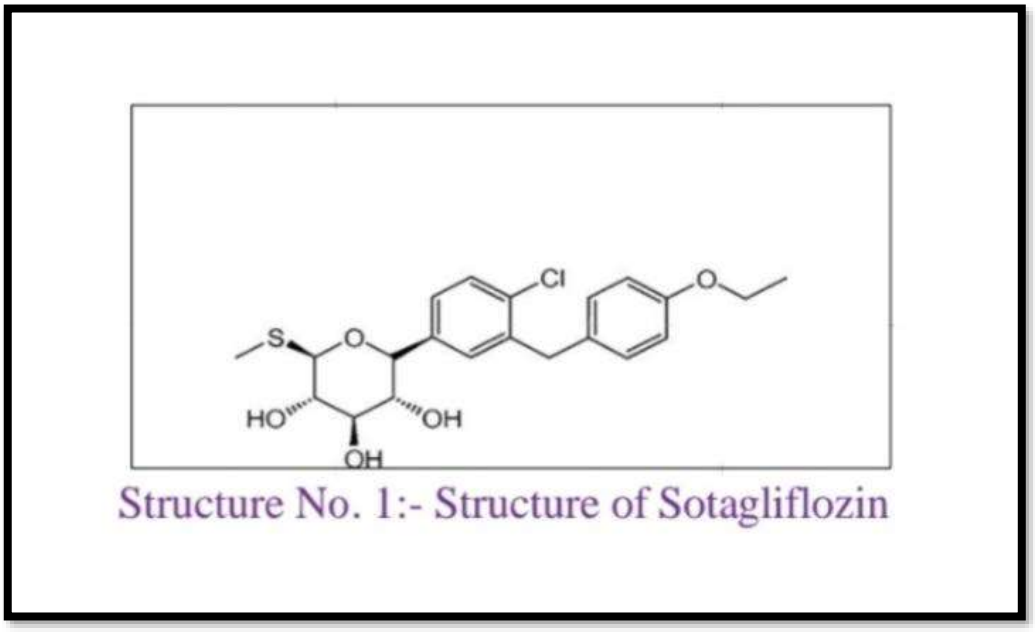
Diabetes mellitus type 2 (T2DM) is a metabolic disease that is becoming more and more common. Globally, it is regarded as a serious public health concern and an expanding epidemic. T2DM affects around 6% of the population generally and accounts for over 95% of all instances of diabetes. If preventive measures are not done, the number of persons with diabetes mellitus is expected to rise from 382 million in 2013 to over 592 million by 2035. India is home to the second-highest number of diabetic patients worldwide, after China, whose number is estimated by the International Diabetes Federation (IDF) to increase from 65.1 million to 109 million by 2035. Numerous micro- and macrovascular problems, including peripheral vascular disease, retinopathy, neuropathy, nephropathy, hypertension, coronary artery disease, and stroke

Structure of sotagliflozin:-

LX4211, sometimes referred to as agliflozin, is a tiny, oral medication that inhibits SGLT-1 and SGLT-2. However, in humans, SGLT-2 has 20 times more selectivity than SGLT-1, with IC50 values (the concentration that causes half of maximum inhibition) for SGLT-2 and SGLT-1 being 0.0018

µM and 0.036 µM, respectively. The chemical structure of it is 2-[4-chloro-3-[(4-ethoxyphenyl) methyl]phenyl] (2S,3R,4R,5S,6R)].Fig. 1 depicts -6-methylsulfanyloxane-3,4,5-triol.

Similar to the selective SGLT-2 inhibitors canagliflozin and dapagliflozin, sotagliflozin is also effective in inhibiting SGLT-2, although it is more than ten times more potent in inhibiting SGLT-1. Less is known, though, about how it affects SGLT-1 in different tissues. Sotagliflozin does not appear to impact renal SGLT-1, as detailed below, indicating that its low affinity only has therapeutic effects in tissues where SGLT-1 is highly expressed, such as the gut. Another theory is that because sotagliflozin is present in the intestinal lumen at higher concentrations than in the general circulation, it functions as a strong intestinal SGLT1 inhibitor.



Structure No. 1:- Structure of Sotagliflozin

Conclusion

Sotagliflozin:-

While the CardioVascular Outcome Trial is ongoing, sotagliflozin appears to offer all the benefits of the other SGLT-2 selective inhibitors that are currently on the market. But sotagliflozin has an extra benefit over other SGLT-2is: it delays the intestines' absorption of glucose. Too many pathophysiologic mechanisms remain poorly understood, despite the fact that it is clear that this inhibition may be significant in lowering the glucose peak and reducing post-prandial hyperglycemia. More importantly, there is potential for meaningful favorable interactions as sotagliflozin may interact with other commonly used medications, such as metformin, which may act through changes in the lower gut microbiota, and DPP-4 inhibitors, which may extend the GLP-1 secretion caused by sotagliflozin. But once more, further research is required.

Gliptin:-

From the description above, it is evident that out of many structurally different lead DPP-IV inhibitors, 17 gliptins have been identified during the course of 17 years of research. Gliptins are safe, effective, and well-tolerated. Eight gliptins—including sitagliptin, vildagliptin, saxagliptin, alogliptin, linagliptin, teneligliptin, ananagliptin, and gemigliptin—have so far received approval and are being used in clinical settings to treat type 2 diabetes. Clinical trials are underway for the remaining gliptins. Incretins (GLP-1 and GIP) secretion is glucose dependent; it triggers the release of insulin and restores insulin sensitivity. As a result, long-term gliptin therapy may completely eradicate type 2 diabetes.

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