COMMENTARY ARTICLE

Diabetes Management

SGLT2 inhibitors mechanism and benefit beyond glycemic control (Diabetes)

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Description

SGLT2 inhibitors are a family of prescription medications approved by the FDA for use in adults with type 2 diabetes to reduce blood sugar in conjunction with diet and exercise. As a glucose-lowering drug, SGLT2 inhibitors have been shown to play an important role in reducing major adverse cardiovascular events and hospitalisation for heart failure in diabetic patients. Canagliflozin, dapagliflozin, and empagliflozin are examples of SGLT2 inhibitors.

SGLT2 (Sodium-glucose Cotransporter-2) is a protein that transports and promotes the reabsorption of glucose from glomerular filtration back into circulation and is in charge of the kidney's glucose reabsorption. SGLT2 inhibitors are a novel family of oral drugs used to treat type 2 diabetes that have a distinct mechanism of action and reduce glucose levels without the usage of insulin. SGLT2 inhibitors have been licenced by the FDA (Food and Drug Administration) and have been used to treat diabetes since 2013.

There are three types of medications utilised in treatment. They are as follows: Dapagliflozin (Forxiga), Canagliflozin (Invokana), and Empagliflozin (Jardiance) The efficacy and safety of SGLT2 inhibitors in type 1 diabetic patients have not been established. Research has indicated advantages in diabetic cardiac patients, and it is being examined for possible usage in type 1 diabetes. The kidneys contain SGLT2, a low-affinity, high-capacity glucose transporter (proximal tubule). It accounts for 90% of glucose reabsorption. Inhibiting SGLT2 causes a drop in blood glucose due to an increase in renal glucose excretion. The mechanism of action of this new family of medications also provides further glucose management by increasing insulin sensitivity and glucose uptake in the body.

Due to a lack of constant food supply, we designed an ingenious mechanism for maximising energy conservation and storage in prehistoric periods. This mechanism decreases the activity of the neurological endocrine system in order to slow down metabolism and save the stored energy in our bodies, as well as a strategy to increase reabsorption of excess glucose eliminated by the kidneys. Because the majority of type 2 diabetes patients have an adequate, if not overabundant, supply of glucose from the foods we eat, this mechanism is no longer required for survival and, in fact, contributes to increased weight and diabetes risk.

The first flaw was solved in May 2009 when the FDA authorised Cycloset (bromocriptine mesylate fast release), and now we have pharmaceuticals to address the second half of this problem with the approvals of Invokana (canagliflozin), Jardiance (empagliflozin), and Farxiga (dapagliflozin). SGLT2 inhibitors include empagliflozin, canagliflozin, dapagliflozin, and ipragliflozin (which has not yet been approved

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for use in the U.S.). The FDA has approved canagliflozin as the only medication in this class for the treatment of type 2 diabetes.

The most prevalent side effects of canagliflozin are vaginal yeast infections and urinary tract infections, with female patients and uncircumcised men being more at risk. There is also an increased desire to pee, and the medicine is not recommended for those who have type 1 diabetes, have frequent ketones in their blood or urine, have significant renal impairment, end stage renal disease, or are on dialysis. Patients should be told to expect glucose in their urine.