Empagliflozin: Novel antidiabetes and pro-cardiac drug

Sir,

Diabetes mellitus is associated with significant cardiovascular (CV) morbidity and mortality. Empagliflozin is the first Food and Drug Administration-approved antidiabetes drug to decrease the risk of CV mortality in patients with type 2 diabetes and CV disease.

Empagliflozin has been shown to improve glycaemic control and reduce CV mortality along with salutary effects on renal outcomes as compared to placebo in a recently conducted EMPA-REG OUTCOME trial in a large number of patients.\(^1,2\) In this study, more than 7000 patients were randomly assigned to receive empagliflozin in the dose of 10 mg or 25 mg or placebo once daily. Patients were followed up over a median observation time of 3.1 years. Patients in the empagliflozin group suffered significantly lower rates of CV death (3.7% vs. 5.9% in the placebo group; 38% relative risk reduction), death from any cause (5.7% and 8.3%, respectively; 32% relative risk reduction) and hospitalisation for heart failure (HF) (2.7% and 4.1%, respectively; 35% relative risk reduction). Diabetic patients prone to CV events who received empagliflozin along with standard care had a reduced rate of the primary composite CV outcome and death from any cause, when compared with placebo.

Renal tubular sodium glucose cotransport receptors (SGLT2 receptors) cause increased tubular glucose reabsorption. These receptors are upregulated in type 2 diabetes. More sodium reabsorption in the proximal renal tubules results in low sodium delivery to the macula densa, which results in vasodilation of the afferent arteriole with vasoconstriction of the efferent arteriole causing intraglomerular hypertension. Inhibition of SGLT2 receptors by empagliflozin abolishes the above effects and explains its cardiorenal benefits in such patients.\(^1,5\) Simultaneous reduction in both preload (by diuresis) and afterload (by decreasing arterial stiffness and blood pressure) could likely to have resulted in the reduction of CV mortality by empagliflozin. Analysis from EMPA-REG OUTCOME also suggested that positive change in haemoglobin/haematocrit was most likely associated with both improved HF and death risk.\(^3,4\) It is also hypothesised that empagliflozin improves cardiac fuel metabolism, by shifting energy substrate utilisation away from glucose and lipids towards ketone bodies that produce more ATP energy than glucose or FFA, thereby increasing myocardial contractility and cardiac efficiency.\(^4\)

To reduce CV risk, many evidence-based treatments are available such as lipid-lowering agents, antihypertensives and antiplatelet aspirin. Empagliflozin can be a potential game changer to decrease CV risk in diabetic patients. Glucose in urine is generally regarded as a poor control of diabetes, but now we need to get used to the finding of glucosuria induced by empagliflozin for the control of diabetes. Oral hypoglycaemic drugs are not used in the perioperative period; however considering the prominent CV benefits, empagliflozin can be useful perioperatively although future research studies are warranted.

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Conflicts of interest
There are no conflicts of interest.

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In view of a potentially difficult airway, we decided to proceed with combined spinal-epidural anaesthesia. In the operating room, the patient was noted to have heart rate of 70/min with sinus rhythm, blood pressure 158/68 mmHg and SpO₂ 98%. An 18 gauge intravenous cannula was secured, and the patient was preloaded with Ringer lactate solution. The patient was given injection midazolam 1 mg intravenously, and the left radial artery cannulated secured under all aseptic precautions for beat-to-beat blood pressure monitoring. An epidural catheter was introduced in the L1–L2 space and a subarachnoid block was given in the L3–L4 space with 5mg of 0.5% injection bupivacaine (with dextrose) using 25 gauge Whitacre needle in sitting position. Following this, 85.2 mg 2% injection lignocaine was given through epidural catheter. The surgical incision was allowed when loss of pinprick sensation reached T10 dermatome level bilaterally, and Bromage scale of three was achieved. Obturator nerve block was given on the left side with 15 ml of 0.5% injection bupivacaine to prevent sudden jerk (adductor reflex) intraoperatively, which may lead to bladder perforation and incomplete resection of the bladder tumour.

It is an effective and safe method to prevent adductor muscle spasm in tumours located on the lateral bladder wall.

Oxygen was given through nasal cannula at a flow rate of 3 L/min. Intraoperatively, the patient had a heart rate 68/min, blood pressure 157/62 mmHg and SpO₂ 100%. The goal was to maintain sinus rhythm, stroke volume and avoid systemic hypotension. Phenylephrine, noradrenaline infusions and defibrillator pads were kept standby. There were no

Sir,
We report a case of a 77-year-old male, admitted with complaints of bleeding and intermittent painful micturition. He was a known case of aortic stenosis but was asymptomatic. On examination, the patient was conscious, oriented with Glasgow Coma Scale of 15/15, heart rate 78/min, blood pressure 150/60 mmHg and SpO₂ 98%. He was edentulous with an inter-incisor gap of less than two fingers. The patient belonged to New York Heart Association Grade II. There was an ejection systolic murmur in second right intercostal space. Examination of other systems was within normal limits. He was advised to undergo aortic valve replacement, which was refused by him and his relatives.

Patient's electrocardiography showed left axis deviation and left ventricular hypertrophy. Two-dimensional echo showed mixed aortic valve disease (degenerative type) with aortic valve area of 0.71 cm² and transaortic gradient (peak/mean) 85/52 mmHg, concentric left ventricular hypertrophy with no regional wall motion abnormality. Contrast-enhanced computed tomography showed distended urinary bladder with maintained contours, having normal capacity. A well-defined nodular lesion of 1.53 cm × 1.42 cm was seen at 5'o clock position at left posterolateral bladder wall, and rest of the bladder walls are of normal thickness.