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CASE REPORT

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Perioperative genitourinary infection associated with sodium-glucose co-transporter 2 inhibitor use

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ABSTRACT

Context: Sodium-glucose co-transporter 2 (SGLT-2) inhibitors are a novel treatment approved for type 2 diabetes mellitus to lower hyperglycemia, systolic blood pressure, and promote weight loss. Commonly reported serious adverse events include increased mycotic urogenital infections, orthostatic hypotension, and normoglycemic ketoacidosis.

Case report: We present a case of a 47-year old man with a history of type 2 diabetes mellitus initiated on the SGLT-2 inhibitor canagliflozin preoperatively before a penile implant, who presented with late postoperative MRSA bacteremia and scrotal abscess requiring implant extraction.

Conclusion: As the SGLT-2 inhibitors are gaining in popularity, prescribers must be aware of the potential adverse genitourinary infectious outcomes. Providers should use caution and avoid initiating SGLT-2 inhibitors in the perioperative setting, and may even consider holding or discontinuing this medication in the setting of impending GU surgery.

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Sodium glucose co-transporter inhibitor; SGLT2 inhibitor; genitourinary infections

1. Introduction

Sodium glucose co-transporter 2 (SGLT-2) inhibitors are a relatively new class of oral hypoglycemic medications used for type 2 diabetes mellitus via an insulin-independent mechanism [1]. On 29 March 2013, canagliflozin became the first FDA approved SGLT-2 inhibitor for type 2 diabetes mellitus [2]. Since approval it has been shown to lower hemoglobin A1c in those patients who have not achieved adequate control with diet and exercise [3]. In addition, SGLT-2 inhibitors have also been shown to lower blood pressure and promote weight loss. However, an increased risk of genital mycotic infections, orthostatic hypotension, and normoglycemic ketoacidosis have been reported [4]. Unfortunately, the specific incidence of urinary tract infections has not been well established in the setting of genitourinary (GU) surgery.

2. Case presentation

A 47-year old man with a history of diabetes mellitus Type 2 presented with acute onset progressive scrotal swelling, pain and fever three weeks following penile implant surgery. Medications on admission included canagliflozin-metformin, added immediately preceding surgery to improve his perioperative glucose control. On physical examination, the patient was febrile with scrotal swelling and tenderness to palpation. Laboratory evaluation was unremarkable including WBC count of 7500 c/mm^3 and serum lactate of 1.0 meq/L. Urinalysis was positive for glucose and trace ketones but negative for bacteria and white cells. A CT pelvis identified scrotal fluid consistent with abscess, and he was brought to the OR for penile prosthesis explant. Cultures grew MRSA and gram-negative rods. Blood cultures found MRSA bacteremia on second day of hospitalization. The patient was eventually discharged on IV vancomycin and amoxicillin-clavulanic acid for 14 days. In addition, the patients SGLT-2 inhibitor, canagliflozin, was discontinued. The incident was reported to the FDA's post-marketing surveillance system.

3. Discussion

SGLT-2 inhibitors are a novel treatment option for Type 2 diabetes mellitus which have been shown to lower hyperglycemia, systolic blood pressure, and promote weight loss [5] with reported adverse events including infections involving the GU tract due to the medication mechanism of action [6]. Approximately 180g of glucose is filtered through the renal system daily with almost 90% reabsorbed in the proximal tubule by the glucose transporter protein, SGLT-2 [7]. Canagliflozin is a selective SGLT-2 inhibitor which increases urinary excretion of glucose but is associated with an increased rate of GU infections [8]. The incidence of GU infections on an SGLT-2 inhibitor in the setting of GU surgery has not been described, but caution should be taken in perioperative use of this class in light of this risk.

This case highlights the potential risks of hyperglucosuria in the face of genitourinary surgeries. Although a single case report, there have been numerous other reports of genitourinary infection rates in non-surgical patients that make this association possibly causative.

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Providers should use caution and avoid initiating SGLT-2 inhibitors in the perioperative setting, and may even consider holding or discontinuing this medication in the setting of impending GU surgery. If perioperative glucose control is needed in patients undergoing GU surgery, other hypoglycemic agents should be considered. Further studies are needed to determine if providers should avoid SGLT-2 inhibitors in the perioperative period for GU surgeries, and if so, for how long.

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