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Dapagliflozin-associated euglycemic diabetic ketoacidosis in a patient with type 2 diabetes mellitus

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Case Study: We report a case of euglycemic diabetic ketoacidosis (eDKA) after the administration of a sodium-glucose co-transporter 2 (SGLT 2) inhibitor in a patient with type 2 diabetes mellitus. A 76-year-old woman with a 40-year history of diabetes mellitus sustained a compression fracture of 1st lumbar spine 5 days prior to presentation. She presented to our hospital with malaise, fever, and oliguria and a history of using oral hypoglycemic agents (metformin 1,000 mg/day, dapagliflozin 10 mg/day). Upon presentation, her laboratory tests showed the following results: white blood cell (WBC) count 11,800/uL (neutrophils 85.3%), hemoglobin 13 g/dL, blood urea nitrogen (BUN) 41.7 mg/dL, creatinine (Cr) 3.2 mg/dL, and C-reactive protein 54 mg/dL. Routine urinalysis showed protein 3+, WBC 10-15/high-power field (HPF), red blood cells 10-30/HPF, and spot urine protein/Cr ratio was 1.14 g/g. After urinary catheterization, her urine output was 1,950 mL, which suggestive of postrenal acute kidney injury. Computed tomography of abdomen showed bilateral pyeloureteritis and diffuse paralytic ileus. Intravenous administration (IV) of antibiotic and total parenteral nutrition were initiated with nasogastric (NG) tube insertion. On the 3rd hospital day, her serum Cr was 0.7 mg/dL. The patient's ileus improved; therefore, she was switched to enteral feeding via a NG tube with re-institution of metformin and dapagliflozin. However, on the 5th hospital day, the patient developed consciousness alterations such as confusion, lethargy, and stupor. Arterial blood gas analysis showed a blood glucose level of 156 mg/dL, pH 7.002, PaCO₂ 12.6 mmHg, HCO₃⁻ 3.1 mmol/L, serum lactate 1.1 mmol/L, and a ketone level of 2.7 mmol/L, consistent with eDKA. Laboratory tests of blood showed BUN/Cr level of 35.3/1.0 mg/dL, Na⁺/K⁺/Cl⁻ 162/2.5/121 mEq/L, respectively, and urine ketone 3+. We discontinued dapagliflozin and initiated IV of hypotonic saline and glucose-insulin-electrolyte fluids. The patient's mental status and laboratory findings improved gradually.