

Metformin-associated lactic acidosis precipitated by acute ureteral obstruction with a single kidney

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Metformin is an oral hypoglycemic medication commonly used as a first-line agent to treat type 2 diabetes mellitus (DM) owing to its favorable safety profile. In patients with impaired kidney function, however, metformin may rarely cause potentially fatal lactic acidosis. We report a case of a 35-year old man with a medical history of DM treated with metformin and insulin for 8 years. Computed tomography (CT) performed to evaluate pancreas revealed that right kidney was severely atrophic and left kidney had a few tiny stones with mild ureter dilatation without obstruction. However, he did not have any discomforts such as urinary symptoms, or decreased urine output. Three months after CT examination, he presented to our emergency department with a 5-day history of nausea and vomiting. He was drowsy, but vital signs were stable. Initial laboratory findings were remarkable with acute kidney injury (AKI) (FeNa 1%) with severe lactic acidosis (lactate >15mmol/L), and admitted to intensive care unit for continuous renal replacement therapy (CRRT). The CT scan showed a left renal stone migrated downward to ureterovesical junction. After placing a nephrostomy catheter on the left side, serum creatinine decreased dramatically and returned to the normal range, along with a complete recovery from lactic acidosis. After double J stent insertion, the patient underwent retrograde intrarenal surgery to remove stones and there was no recurrence thereafter. Metformin may cause lactic acidosis by promoting the conversion of glucose to lactate in the splanchnic bed of the small intestine and inhibiting hepatic gluconeogenesis from lactate. In the absence of acute overdose, metformin-associated lactic acidosis rarely develops in patients with comorbidities such as renal or hepatic insufficiency or acute infection. Though it is rare, the mortality is high, up to 45% in one case series. This case highlights a relatively rare, but serious complication from metformin. To prevent this serious side effect, it is crucial to avoid metformin when there is a risk of AKI. Severe metabolic acidosis can be treated with CRRT with discontinuation of metformin and correction of the cause of AKI.

