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Metformin overdose induced acute kidney injury not accompanied with lactic acidosis: a case report

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Background: Background: Metformin is well established as first-line drug for management of type 2 diabetes mellitus (T2DM) and the concern and reports for prescription of metformin in several specific situations including chronic kidney disease (CKD), and hypovolemic state are rapidly growing now. Lactic acidosis is a rare complication of metformin, but a lactic acidosis is very fatal and its mortality is approximately 50%. Because metformin is mainly excreted in an unchanged form by kidney, the lactic acidosis associated with use of metformin develops more easily in the setting of renal dysfunction, such as CKD, and acute kidney injury (AKI). When the metformin is used in patients with a glomerular filtration rate (GFR) below 30 ml/min especially, the patients have the higher risk of lactic acidosis. In addition, metformin intoxication compared to a therapeutic dosage of metformin usually shows a higher incidence of lactic. Metformin induced AKI not accompanied with lactic acidosis is also rare. Herein, we report an interesting case: metformin overdose induced acute kidney injury not accompanied with lactic acidosis.

Case report: A 57 year old male visited our emergent department with symptoms of oliguria, general weakness, and generalized edema. He has taken a metformin during 30 years for management of T2DM. He impulsively ingested about twenty tablets of metformin (about 20 g metformin) in once due to recently extreme stressful private events three days prior to admission at our emergent department. His serum creatinine level was very high at time on admission, however, his serum lactate was normal, and arterial blood gas analysis also showed normal anion gap metabolic acidosis. Abdominal computed tomography (CT) showed the perinephric fat stranding and mild swelling of the kidney without hydronephrosis. We performed conservative therapy with avoidance of nephrotoxic agents, and hydration. Although we performed only conservative care without renal replacement therapy, his laboratory data and uremic symptoms rapidly began to be improved.

Conclusion:The case of metformin overdose induced AKI can give a good guidance for metformin-use in high risk patients of renal dysfunction. Although there was not lactic acidosis in this case report, we should make sure close monitoring for renal function and development of lactic acidosis in setting of metformin overdose. There are no confirmed evidence and guideline on when to avoid metformin in patients with decreased renal function. However, so far, many physicians try to determine whether or not to use metformin in accordance with renal function because of lactic acidosis related with metformin. So, this case report can be a new consideration for using of metformin in renal impairment.

Methods: N/A

Results: N/A

Conclusion: N/A

Keywords: Acute kidney injury, Lactic acidosis , Metformin