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Clinical Characteristics of Metformin-Associated Lactic Acidosis : Case Series in Single Center

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Objectives: Metformin is the first choice oral anti-hyperglycemic drug for type 2 diabetes. Metformin-associated lactic acidosis (MALA) is associated high mortality rate, can occur in patients with impaired renal function, liver dysfunction and heart failure.

Methods: We identified 134 patients with metabolic acidosis with lactic acidosis or ketoacidosis through the search of diagnosis code from January 2009 and January 2018. Among them, patients with type A lactic acidosis, alcoholic or diabetic ketoacidosis and low lactic acid level (<5 mmol/L) were excluded. A total of 13 patients was enrolled and reviewed about premorbid conditions, laboratory data, therapy and outcomes.

Results: The mean age of 13 patients (7 males, 6 females) were 61.8 years old (range, 43- 78). The arterial pH was 6.9±0.1, mean serum lactate 14.9±4.1 mmol/L, mean anion gap 44.2±5.1 and the mean daily dose of metformin 1315.4±409.2mg. Twelve patients had impaired renal function on admission eGFR=22.4±24.5 ml/min/1.73m^2). Among these patients, eight patients had chronic kidney disease (CKD) before admission. Six patients had history of alcohol abuse and liver cirrhosis. The most common symptom was decreased mentality and other symptoms were non-specific gastrointestinal symptoms such as anorexia, nausea, vomiting, diarrhea and abdominal pain. Nine patients received renal replacement therapy (continuous veno-venous hemodiafiltration, n=8; intermittent hemodialysis, n=1), and the remaining four patients were treated fluid resuscitation with sodium bicarbonate. Two patients (15.4%) died despite renal replacement therapy.

Conclusions: The symptom and sign of MALA is often not specific and undistinguishable from other severe diseases, thus hindering early recognition. Physicians should suspect of MALA in all diabetic patients taking metformin with high anion-gap metabolic acidosis especially with predisposing factor.