

中文題目：Metformin 相關乳酸中毒的少見腦部核磁共振表現-病例報告

英文題目：A uncommon presentation of metformin associated lactic acidosis: Lentiform Fork sign
- A case report

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Introduction:

Although Metformin is the mostly prescribed oral anti-diabetic agents, some patients may not suitable due to the risk of lactic acidosis. Metformin-associated lactic acidosis (MALA) is uncommon; however, the possible side effect of metformin-associated encephalopathy is even rarer. And there is a rare but very characteristic magnetic resonance imaging (MRI) findings, as known as “the lentiform fork sign”, in Metformin-associated encephalopathy. Here, we present a case of this neuro-radiological abnormality which was encountered in a patient with MALA.

Case presentation:

A 40-year-old woman with diabetes mellitus, hypertension and end-stage renal disease who was on maintenance hemodialysis presented with progressive weakness over bilateral lower limbs, slurred speech, unsteady gait, and dyspnea for one week. The patient had been using anti-diabetic agents, including Metformin which she bought by herself without prescription, Repaglinide and Liraglutide. On examination, she was alert and fully oriented. The temperature was 36.5°C, the blood pressure 219/111 mmHg, the heart rate 78 beats per minute, the respiratory rate 18 breaths per minute, and the oxygen saturation 100% while she was breathing ambient air. Finger stick showed 80 mg/dl. Kussmaul breathing was recognized. Besides, she had anemia (Hb: 10.8 g/dL; 13.5-17.5), hyperkalemia (5.22 mmol/L; 3.5-5.0), metabolic acidosis (bicarbonate 5.6 mmol/L; 24-28), and hyperlactatemia (15.2 mmol/L; 0.4-2.0). Brain MRI revealed swelling, T2-FLAIR hyperintensity, small central diffusion restriction foci at bilateral lentiform nuclei with lentiform fork sign (Figure 1) and significant lactate peak on magnetic resonance spectroscopy (MRS). (Figure 2a, Figure 2b) MALA was diagnosed. Emergent hemodialysis was then performed for severe metabolic acidosis. Her general condition got improved gradually after hemodialysis and discontinuation of metformin. The symptoms, including slurred speech, unsteady gait, also subsided gradually.

Discussion:

Metformin is known to increase plasma lactate levels by inhibiting mitochondrial respiration in the liver. Elevated plasma metformin concentrations (in individuals with renal impairment) and a secondary event that disrupts lactate production or clearance (such as cirrhosis, sepsis, or hypoperfusion), are typically the reasons to cause MALA. In the other hand, a syndrome showing an expansile high signal intensity on T2-weighted MRI over basal ganglia was known as “the lentiform fork sign”, which causes neurological disturbance including movement disorders like parkinsonism. Metformin-induced encephalopathy is one of the causes of the lentiform fork sign and is distinctive by “onset with metformin and improvement with withdrawal”. In addition, a lactate peak on MRS is regarded as sensitive evidence of lactate accumulation in the brain.

Conclusion:

Metformin induces metabolic encephalopathy may occurred in some patients with advanced chronic kidney disease, resulting in impaired consciousness and parkinsonism-like movement. This encephalopathy has a characteristic but not common-seen MRI feature in lentiform nuclei known as the “lentiform fork sign”.

Figure 1

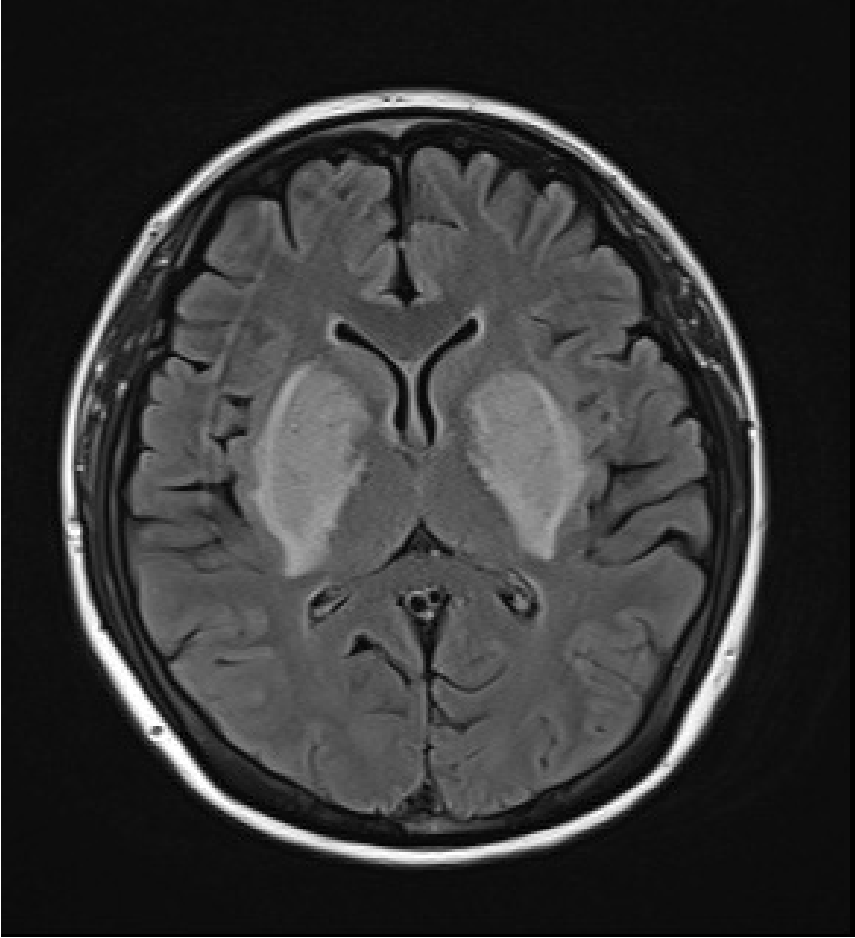


Figure 2a

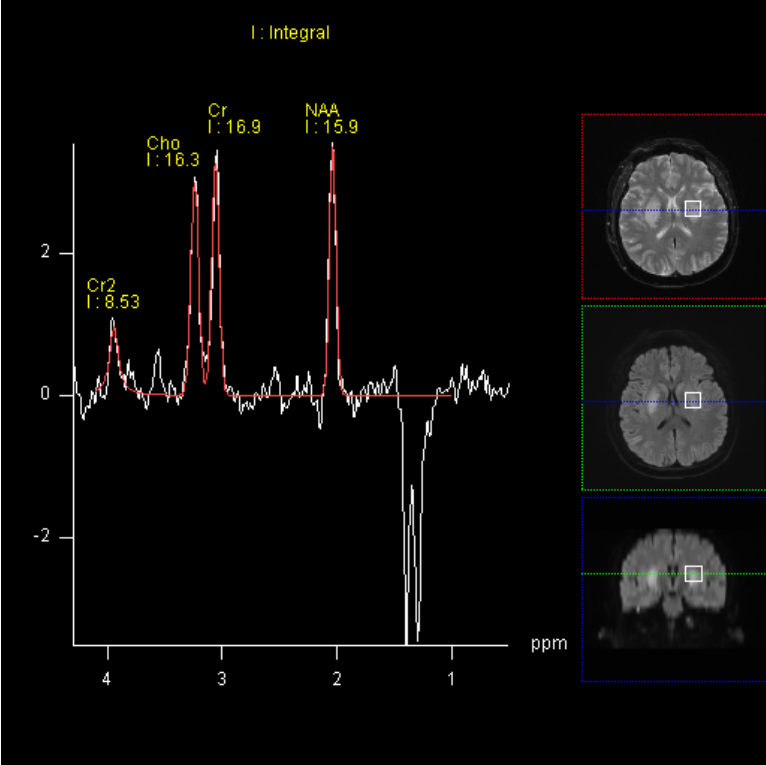


Figure2b

