

Title: PSEUDOMYOCARDIAL INFARCTION IN DIABETIC KETOACIDOSIS

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Case Vignette

Introduction: Diabetic ketoacidosis (DKA) is associated with elevated serum potassium concentration, which, in turn, can cause ECG changes. Here, we present a case of a patient with DKA and hyperkalemia who presented with ECG mimicking an acute inferior/posterior STEMI which has rarely been described.

Case Report: 48-year-old male with ESRD on HD, type 1 diabetes mellitus, hypertension, and dyslipidemia who presented to the ED following a fall from his bed and was found to have diabetic ketoacidosis and hyperkalemia. A STEMI alert was called when the patient arrived as his ECG revealed sinus tachycardia with ST elevation in inferior leads with ST depression and T wave inversion in V1, V2; this is highly concerning for inferior/posterior STEMI (see figure 1). However, patient denied any chest pain. Serial troponins were negative. Echocardiogram showed normal biventricular systolic function without wall motion abnormality. Other laboratory test findings on admission included a potassium of 9.0mmol/L and creatinine of 10.5 mg/dL. As patient's ECG changes were disproportionate to his clinical findings, the patient did not undergo cardiac catheterization; rather, he was conservatively managed, and he underwent emergent hemodialysis. His ECG changes normalized with correction of his metabolic derangements (see figure 2)



Figure 1

Figure 2

Discussion: Here, we present a rare case of a patient with diabetic ketoacidosis and hyperkalemia whose ECG mimics the finding seen on a STEMI. These cases are uncommon but reported in the literature ⁽¹⁾. There is no clear understanding of the pathophysiology. The ST segment elevations in myocardial infarction are due to inhomogeneous potassium distribution in the epicardium vs the endocardium because of different degree of cellular damage; this creates a disparity in the onset of repolarization. Our patient does not have cardiac damage since he has serial negative troponins. Perhaps he had asymptomatic regional pericarditis, caused by kidney failure, which increased the sensitivity of the affected epicardial tissues to high potassium. In any case, an awareness that patients with DKA and hyperkalemia can present with ECG findings of STEMI without true ACS has implication on management- perhaps avoiding dangerous and unnecessary procedures in the right group of acutely ill patients.

References: 1. Bellazzini MA, Meyer T. Pseudo-myocardial infarction in diabetic ketoacidosis with hyperkalemia. *J Emerg Med.* 2010;39(4):e139-e141. doi:10.1016/j.jemermed.2007.04.024

