Diabetic Ketoacidosis Masquerading as Ventricular Bigeminy in an Adult Patient Scheduled for Emergency Lumbosacral Laminectomy for Cauda Equina Syndrome

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A 58-year-old man was scheduled for an emergency lumbosacral laminectomy for cauda equina syndrome. The patient was diagnosed with hypertension 2 years ago and was not compliant with the prescribed antihypertensives. There were no other comorbidities. Since the surgery was emergent in nature, the patient was wheeled into the operation theater (OT), pending laboratory investigations. In the OT, standard American Society of Anesthesiologists (ASA) monitors were attached. Baseline hemodynamic parameters were normal and the electrocardiogram (ECG) showed sinus rhythm. General anesthesia was induced with intravenous (IV) morphine 7.5 mg, thiopentone 350 mg, and vecuronium 8 mg. The airway was secured using a no. 8 armored endotracheal tube. The patient was then placed in the prone position for surgery. Immediately afterward, the ECG showed ventricular bigeminy. Lidocaine 100 mg IV was administered, which resulted in transient normalization of the ECG rhythm. Anticipating hemodynamic deterioration, an arterial cannula was inserted in the left radial artery and an arterial blood gas (ABG) sample was sent. The ABG showed metabolic acidosis (pH: 7.29; pCO_2: 43.3 mmHg; pO_2: 107.1 mmHg; HCO_3: 20.7 mmol/L; and base excess [BE]: –5.6 mmol/L) with a glucose value of 429 mg/dL and lactate of 1.97 mmol/L. Electrolytes were within normal limits (sodium: 139 mmol/L; potassium: 3.73 mmol/L; calcium: 0.95 mmol/L; and chloride: 105 mmol/L). Capillary blood glucose was also 450 mg/dL. One liter of a balanced crystalloid was given as a bolus and IV insulin infusion was started after giving a bolus of 8 U. An ABG repeated after 1 hour also showed metabolic acidosis (pH: 7.26; pCO_2: 41.3 mmHg; pO_2: 130.4 mmHg; HCO_3: 18.4 mmol/L; BE: –8.2 mmol/L; and lactate: 1.67 mmol/L) and a blood glucose of 363 mg/dL. Electrolytes were near normal (sodium: 142 mmol/L; potassium: 3.31 mmol/L; calcium: 1.09 mmol/L; and chloride: 112 mmol/L). The urine sample tested positive for ketone bodies. Arrythmias persisted throughout the intraoperative period. However, the patient was hemodynamically stable throughout the surgery. The surgery lasted for 2 hours and the trachea was extubated uneventfully. The patient was shifted to the intensive care unit (ICU) for observation and further evaluation. Glycosylated hemoglobin level was 13.4%. IV insulin infusion was continued according to the blood sugar levels for the first postoperative day. A two-dimensional (2D) echocardiography was normal except for the presence of concentric left ventricular hypertrophy and grade 1 diastolic dysfunction. Postoperative 12-lead ECG as well as cardiac troponins were normal. No phosphate supplementation was done, but hyperphosphatemia of 4.91 and 6.1 mg/dL was observed on the first 2 postoperative days. Other electrolytes were within normal limits (sodium: 136.3 mEq/L; potassium: 4.66 mEq/L; and chloride: 112.7 mEq/L). No arrhythmia was observed during the entire postoperative period in the ICU. The patient was shifted out of the ICU after commencing subcutaneous insulin administration on the second postoperative day. He was discharged after 4 days once blood sugars were controlled and urine ketone bodies turned negative.

The triad of hyperglycemia, acidosis, and dyselectrolytemia in diabetic ketoacidosis (DKA) can affect the heart and manifest as arrythmias even in the absence of preexisting cardiovascular disease.[1,2] Arrythmias have also been reported in spine surgeries in the prone position due to the hemodynamic alterations associated with this position.[3] In our patient, the

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underlying DKA was probably unmasked by the hemodynamic changes associated with general anesthesia and prone position. The cumulative effect of the autonomic dysfunction secondary to poor glycemic control and the altered physiology under anesthesia and prone position manifested as persistent ventricular bigeminy, which did not respond to pharmacological measures. Arrythmias in the setting of DKA may also be precipitated by dyselectrolytemia.[4] Hyperphosphatemia is common in DKA, which is likely because of the transcellular shift due to osmotic effect of serum glucose and the organic anions.[5] A high index of suspicion is required to correctly identify the cause of intraoperative arrythmias. Deranged blood sugar should always be considered a possibility. A random blood sugar report should be available in all patients scheduled for surgery.

Conflict of Interest
None declared.

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