Introduction

- Chronic alcohols presenting with acute intoxication often present a diagnostic and treatment challenge to emergency medicine physicians.
- The history and physical examination may be limited by altered mental status or combativeness.
- Early anchoring and labeling patient as ‘just another drunk’ may lead emergency medicine physicians away from a comprehensive workup.
- Their clinical status is dynamic with rapid changes occurring during their ED course (i.e. development of alcohol withdrawal).
- We present a case of alcohol withdrawal syndrome with severe hypomagnesemia, which led to acquired Torsades de Pointes and cardiac arrest.

Case

A 45-year-old man with a history of severe alcohol withdrawal was brought in by family for “detox.” He reported months of heavy daily vodka consumption, approximately 750 mL per day. He reported vomiting, headache, and tremulousness. He denied taking any medications.

Initial vital signs: 37°C, HR 110, BP 137/104, RR 16, 100% on RA.

On exam, he was atraumatic, sober with a clear sensorium, but mildly diaphoretic with tongue fasciculations.

Patient was actively vomiting and was given two doses of ondansetron 4 mg IV.

Initial ECG, obtained to evaluate his tachyarrhythmia, showed sinus tachycardia with QTc 527 ms. Subsequent ECG showed QTc 498 ms. Providers attributed his long QT to ondansetron administration. (FIGURE 1)

Initial labs:

- AST: 172
- ALT: 92
- Alk Phos: 143
- Bilirubin: 13
- Alb: 4
- Glucose: 39
- INR: 1.3
- PT: 12.4
- PTT: 31
- BUN: 32
- Creatinine: 0.9
- Sodium: 134
- Potassium: 9.3
- Chloride: 114
- Calcium: 9.5
- Phosphate: 6.9
- Magnesium: 2.0
- CO2: 15
- Hemoglobin: 12.8
- WBC: 8.7
- Platelets: 141
- Neutrophils: 72
- Lymphocyte: 27
- Monocyte: 9
- Eosinophil: 1
- Basophil: 2

Case (continued)

- The anion gap was initially attributed to alcohol ketoacidosis, and no further workup was pursued.
- After initial resuscitation with IV fluids and benzodiazepines, the patient was admitted to a monitored bed for management of alcohol withdrawal syndrome.
- While boarding in the emergency department, he became unresponsive and was found to have pulseless ventricular fibrillation. He received one round of CPR with defibrillation after which he regained full consciousness.
- A retrospective review of his rhythm strip revealed runs of polymorphic ventricular tachycardia prior to his arrest. Empiric magnesium repletion was begun for suspected Torsades de Pointes. (FIGURE 2)
- Post-arrest labs revealed hypomagnesemia 0.8 mg/dL, hypokalemia 3.1 mmol/L, hypophosphatemia 2.2 mg/dL, and a mixed metabolic acidosis with respiratory alkalosis.
- After electrolyte repletion, the patient’s QTc decreased to 460 ms.

Discussion

- Acquired Torsades de Pointes is a polymorphic ventricular tachycardia most often caused by hypomagnesemia. It is often heralded by QT interval prolongation with QTc >500ms associated with the greatest risk of developing Torsades de Pointes. 1
- If left untreated, Torsades de Pointes has the potential to degenerate into ventricular fibrillation.
- Patients with chronic alcohol use are at increased risk of hypomagnesemia and other electrolyte derangements. Acute alcohol consumption promotes urinary wasting of magnesium up to 30 days following consumption. 2,3
- Chronic alcohol use can trigger hypomagnesemia via malnutrition or through intracellular shifts precipitated by autonomic overactivity from alcohol withdrawal. 2
- The providers in the case anchored prematurely on a diagnosis and focused only on the symptomatic treatment of alcohol withdrawal syndrome, thus missing underlying severe hypomagnesemia.

Conclusion

- Emergency medicine physicians must maintain a methodical approach to chronic alcohols presenting with acute intoxication. Providers must resist premature anchoring and ensure that life-threatening conditions are ruled out prior to final disposition decisions.

- It is not necessary to obtain the same workup on all patients, but it is important to maintain a high index of suspicion for the following conditions: 4
  - Alcohol withdrawal syndrome
  - Co-ingestion
  - Toxic alcohol ingestion
  - Occult trauma
  - Pancreatitis
  - Bleeding
  - Electrolyte derangements

References


FIGURE 1: Patient’s initial ECG showing prolonged QTc of 527 ms.

FIGURE 2: Lead III rhythm strip showing Torsades de Pointes (Public domain image).