

## **Title** A Rare Case of Catecholamine-Induced Tetany and Novel Approach for Management

### **Introduction**

A catecholamine surge is a rapid release of epinephrine, norepinephrine, and dopamine hormones into the bloodstream. This can occur in response to trauma, strain, surgery, and some other intense physiologically stressful situations. We present a rare case of catecholamine surge leading to muscle rigidity and a novel approach to treat it.

### **Case Report**

A 68-year-old female with a history of severe gastroesophageal reflux disease and stress incontinence secondary to intrinsic sphincter deficiency, presented to the hospital for elective endoscopic urologic procedure. After an uneventful surgery, the patient was extubated. The patient had an episode of vomiting which led to aspiration necessitating re-intubation with sevoflurane. Propofol infusion was administered for sedation and the patient was transferred to the intensive care unit (ICU). Upon arrival in the ICU, the patient was extremely rigid. She was afebrile with a normal heart rate. Vecuronium was given which improved the rigidity. However, a few hours later the patient became very rigid again, both in the upper and lower extremities. The patellar reflex was found to be diminished bilaterally. The vital signs were stable. She developed an erythematous rash on her chest and her left arm became cyanotic. The ultrasound of the left arm showed deep venous thrombosis of the left brachial, basilic, and cephalic veins. A weight-based loading dose of dantrolene was given which was followed by a subsequent dose leading to muscle relaxation. The patient was given high-dose steroids, broad-spectrum antibiotics, and placed on a heparin drip. The patient did not have any other episode of muscle rigidity and eventually was weaned off the ventilator and discharged to a rehabilitation facility.

### **Discussion**

Catecholamine surge classically presents with hypertension, sweating, headache, palpitations, and anxiety. Tetany is not a common symptom of catecholamine surge. Catecholamines act via Gs-coupled B-2 adrenergic receptors to stimulate the cAMP, causing muscle contraction [1]. Dantrolene decreases excitation-contraction coupling and intracellular calcium. As per our review, no case has been reported in which dantrolene was used for catecholamine-induced tetany. Our patient did not have the classic presentation. The stressful event of severe aspiration requiring mechanical ventilation precipitated a catecholamine surge which led to tetany. The novel approach of using Dantrolene to relax the muscle was effective and sustained. Therefore, dantrolene should be considered in patients who develop tetany due to catecholamines.

### **References**

1. Arner, P. (2004). Novel target genes for catecholamines in skeletal muscle. *The Journal of Clinical Endocrinology & Metabolism*, 89(5), 1998–1999. <https://doi.org/10.1210/jc.2004-0385>