

features, antisocial personality disorder, PTSD, and ASD, who was psychiatrically hospitalized for mania and psychosis at a large midwestern university hospital. At the time of evaluation in the emergency department, the patient endorsed suicidal ideation, religious/persecutory delusions, and auditory hallucinations of demons. Zyprexa Zydis was started and titrated to 20 mg every 12 hours, which did not sufficiently improve symptoms. Depakote EC/DR 1000 mg every 12 hours was then added for treatment of mania. Approximately 1 week later, the patient was observed to be somnolent and complained of malaise, nausea, and vomiting.

**Results.** Labs were collected which showed an elevated ammonia level of 336  $\mu\text{mol/L}$  and free valproic acid level of 13.3  $\text{mcg/ml}$ . An EKG was performed which showed first-degree atrio-ventricular block with fusion complexes. The patient's baseline EKG displayed sinus bradycardia with no evidence of atrio-ventricular block. The patient's CMP was unremarkable except total bilirubin of 1.5  $\text{mg/dL}$  and glucose of 104  $\text{mg/dL}$ . His lactate was elevated at 1.95  $\text{mmol/L}$ . The patient's troponin and CRP were unremarkable. The patient was medically transferred for management of hyperammonemia and EKG changes. Depakote was discontinued and lactulose 20 g TID was initiated. Patient was placed on telemetry and the first-degree atrio-ventricular block resolved within 24 hours after discontinuation of Depakote. Daily ammonia level, chem 7, and magnesium were collected. Ammonia decreased to 79 and 59  $\mu\text{mol/L}$  on consecutive days. Sodium was mildly elevated at 144 on day 2 of medical admission. Poison control was contacted and L-carnitine 990 TID was started for suspected carnitine deficiency. The patient medically recovered after several days and was readmitted to the psychiatric hospital for further psychiatric management.

**Conclusions.** The patient's presentation of hyperammonemia and first-degree atrio-ventricular block were likely due to valproic acid toxicity. We suspect that carnitine deficiency contributed to the patient's valproic acid toxicity at lower-than-expected blood levels. Although antipsychotics can cause prolonged QTc interval, conduction disorders are not typical abnormalities. Caution should be taken when prescribing Depakote to individuals at higher risk of developing toxicity, including those with potential nutritional deficiencies as well as those with limited self-advocacy abilities secondary to psychiatric illness. Rapid identification of side effects, such as valproic acid toxicity, remain crucial for favorable patient outcomes.

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## Stimulant Use for ADHD in a Cardiac Transplant Recipient: A Case Report

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### Abstract

**Introduction.** Methylphenidate is a central nervous system stimulant used as first-line treatment for attention-deficit/hyperactivity disorder (ADHD). CNS stimulant use is associated with increased risk of cardiovascular events such as increased resting heart rate and blood pressure, sudden cardiac death, arrhythmia, and stroke. Its safety profile in recipients of cardiovascular transplants is unknown, and more research is warranted to determine the risk of adverse cardiac events due to stimulant medication in this population.

**Methods.** Clinical case report, n=1

**Results/Clinical Case.** A 19-year-old female with a history of restrictive cardiomyopathy, cardiac arrest, and orthotopic cardiac transplant has been treated with methylphenidate for ADHD for approximately 2 years without incident. The patient was diagnosed with ADHD between the ages of 8 and 10 and historically was treated with stimulant medication. At age 13, she experienced a cardiac arrest after a volleyball game with 4–6 minutes of pulselessness. She was successfully resuscitated and underwent defibrillator placement. It was concluded that the patient had restrictive cardiomyopathy undetected at birth, leading to the need for orthotopic cardiac transplantation at age 16. After her cardiac arrest, the patient's memory and cognition worsened, and approximately 1 year after her transplant, she was prescribed amantadine. The patient remained untreated for her ADHD until approximately 1.5 years after her cardiac transplant, at which time she underwent neuropsychological testing that showed findings consistent with attention deficit disorder, and was restarted on stimulant medication. Her transplant cardiologist and psychiatrist have collaborated in her ongoing treatment with methylphenidate 40 mg daily and monitoring symptom response and cardiac stability. Because the patient had previously been stable on stimulant medication for many years, it is reasonable to conclude that stimulant medication did not lead to her cardiac arrest. The patient reports that methylphenidate has been helpful in improving her functioning as a college student, through reduction of her ADHD symptoms. The patient's blood pressure and heart rate remain within an acceptable range and she has not experienced any adverse cardiac events to date while taking methylphenidate.

**Conclusion.** This case sheds light on the potential to treat cardiac transplant recipients with stimulant medication for ADHD. Although a careful evaluation of risk factors must be undertaken in cooperation with cardiology and other specialists, a role exists for the safe use of stimulant medications in the cardiac transplant population.

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## Cariprazine for the Adjunctive Treatment of Major Depressive Disorder: Results of a Randomized Phase 3 Placebo-Controlled Study (Study 301)

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