Nicotine Withdrawal as a Cause for Delirium in a Cardiac Surgery Patient

Primary Author: Kristin Hoffman DO
University of Kentucky

Co-Authors: Habib Srour, MD;

Acute nicotine cessation is known to induce symptoms similar to hyperactive delirium. This case identifies acute nicotine withdrawal as the likely cause for delirium in a post-operative cardiac surgery patient. The patient was a 68 year old male with a past medical history significant for CAD, HTN, HLD, OSA, TIA s/p CEA, AFib, COPD, GERD, CKD III, and HIV who presented to the CV-ICU after a CABG/MAZE procedure. He had an uneventful intraoperative course followed by a normal post-op course on day 1. On day 2, he became profoundly agitated and delirious with HTN and elevated PA pressures. Physical exam was negative for focal deficits. Bedside TTE was performed which showed reduced ejection fraction (EF). Function improved, blood pressure down-trended, and PA pressures normalized with Cardene and Milrinone load. Mental status remained unchanged despite improved perfusion. A low-dose benzodiazepine was administered which did improve symptoms; however, it caused significant somnolence. The patient also became somnolent after low-dose Haldol. He was eventually sedated with a Precedex drip. After further discussion with the family, it was discovered that the patient chewed more than 15 pieces of nicotine gum each day (2mg per piece) and may have been receiving nicotine from other sources, as well. He was subsequently started on a 21mg Nicotine Patch and all symptoms resolved by the following day.

The time course for post-op delirium and nicotine withdrawal are similar, making it difficult to differentiate between the two. The symptoms are similar and include confusion and agitation. Given the patient’s history, TIA was also on the differential but was thought to be less likely given the lack of focal deficits. Alcohol withdrawal was considered, however given that the patient became somnolent from a low-dose benzodiazepine this was unlikely. He and his family also vehemently denied any alcohol use in the last two decades. Studies have proposed that post-op delirium could be caused by central anticholinergic syndrome and historically physostigmine has been given to treat post-op delirium, particularly in the elderly. Nicotine withdrawal has also been shown to have a component of acetylcholine deficiency which could explain the similarity in symptoms.