A Novel Case of Vaping-Associated Diffuse Alveolar Hemorrhage Managed with Veno-Venous Extra Corporeal Membrane Oxygenation (VV-ECMO)

A. Sharma¹, P. Chung¹, M. Bateman¹, M. Kim², Y. Butt³, B. Lindgren¹; ¹Pulmonary, Critical Care and Sleep Medicine, University of Southern California, Los Angeles, CA, United States, ²Anesthesia, Critical Care, University of Southern California, Los Angeles, CA, United States, ³Dept of Lab Medicine and Pathology, Mayo Clinic Arizona, Scottsdale, AZ, United States.

Corresponding author’s email: aniketsharma@gmail.com

The use of E-cigarettes (also called vaping) has become increasingly prevalent amongst adolescents with rates as high as 25%. It delivers substances such as nicotine and tetrahydrocannabinol, but also exposes users to other substances with known harmful effects. Vaping has been linked to a large spectrum of pulmonary diseases with varying severity including acute eosinophilic pneumonia, hypersensitivity pneumonitis, lipid pneumonia, and diffuse alveolar hemorrhage. The use of VV-ECMO for management of vaping-associated lung injury (VALI) is rarely described. We present a 27-year-old male with history of cannabinoid use via vaping who was admitted to the hospital for fevers, chills and flu-like symptoms. Antibiotic treatment for community acquired pneumonia was initiated, but the patient’s respiratory condition and hypoxemia worsened, requiring mechanical ventilation. A CT chest demonstrated bilateral pulmonary infiltrates and bronchoscopy with transbronchial biopsy was performed. Further history revealed that the patient recently purchased vaping supplies online. Given the possibility of acute respiratory distress syndrome and VALI, the patient was started on pulse-dose methylprednisolone. However, his respiratory status deteriorated requiring mechanical circulatory support with VV-ECMO. Repeat bronchoscopy demonstrated diffuse alveolar hemorrhage (DAH), and the pathology from the initial transbronchial biopsy revealed diffuse alveolar damage with intra-alveolar foamy macrophages and pneumocyte vacuolization (Figure 1). The findings were consistent with recent pathological findings in VALI. All other infectious and rheumatologic work-up was unremarkable. With supportive care and corticosteroid treatment, the patient was weaned off VV-ECMO and successfully extubated. A repeat bronchoscopy prior to discharge demonstrated no further evidence of DAH. Vaping-associated lung injury (VALI) has been reported previously but with varying presentation and degrees of severity. Increasing levels of morbidity and mortality have been reported but it is unclear if this is due to increased usage, or improved recognition of VALI. Therefore, the appropriate diagnostic and management strategy still remains unclear. Although VV-ECMO has been used for vaping-associated lung injury previously, we describe the first case of diffuse alveolar hemorrhage (DAH) secondary to vaping that is managed with VV-ECMO. Pulmonary complication of DAH from vaping is uncommon, and the management of such a condition with mechanical cardiac support is unique. While this aggressive intervention should not be the mainstay treatment and its role is unclear, it should be a viable option for those patients who are refractory to all supportive care, pulse-dose corticosteroids, and conventional mechanical ventilation. Furthermore, ongoing research is necessary to elucidate better diagnostic and treatment guidelines for vaping associated pulmonary complications.
This abstract is funded by: None

Am J Respir Crit Care Med 2020;201:A7041
Internet address: www.atsjournals.org