Alternative Therapies for Status Asthmaticus
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Introduction
Status asthmaticus is a feared progression of asthma exacerbation, representing bronchospasm that persists despite utilization of first-line therapies. Inhaled drug use is a known trigger for asthma exacerbations, several cases of opiate inhalation leading to status asthmaticus have been documented¹.

Case Presentation
- A 22 year old female with intermittent asthma presented to our facility with an acute, severe asthma exacerbation approximately 24 hours after heroin inhalation
- She was initially placed on bilevel positive airway pressure (BiPAP) and started on methylprednisolone and ipratropium/albuterol, but she developed worsening hypoxia and work of breathing and required intubation
- She had persistent hypoxia on assist control ventilation, as well as tachycardia and wheezing in all lung fields, and was continued on methylprednisolone every 8 hours as well as receiving around-the-clock bronchodilators
- Serial arterial blood gasses (ABGs) continued to show worsening hypercapnia
- Magnesium, terbutaline, and ketamine were given with minimal improvement, so alternative treatment options were considered, including sevoflurane therapy and omalizumab, both of which had been shown in case reports to have benefit in status asthmaticus²,³,⁴
- Sevoflurane was given with the assistance of the anesthesia team, and an it was maintained on this for approximately 24 hours
  - The patient had improvement of her bronchospasm following this therapy, but notably had two significant adverse reactions: her pupils became unresponsive and she became hypotensive, requiring three vasopressors
  - Both improved when sevoflurane was weaned, with her pupils becoming reactive again and her blood pressure improving to where she no longer required vasopressor support
- Based on her elevated total IgE level of 772.8 (normal <100), she was given a weight-based dose of omalizumab
  - It is a monoclonal antibody that binds to IgE, both decreasing free IgE and inhibiting binding of IgE to receptors on the surface of mast cells
- Given her critical condition, persistent hypercarbia, and bronchospasm, she was evaluated for extracorporeal membrane oxygenation (ECMO) later that day

Discussion
We theorize that administration of omalizumab had a significant role in preventing ECMO cannulation, with sevoflurane also potentially having a synergistic role with a more severe side effect profile. Per our extensive data review, this is the first time omalizumab has been administered in refractory status asthmaticus prior to ECMO use, and potentially had a substantial role in preventing it.

References