

The optimal amount of steroids in exacerbations of COPD
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Story from the front lines

A man in his 60s with a history of chronic obstructive pulmonary disease (COPD), gastroesophageal reflux, hypertension and pulmonary hypertension with right-sided heart failure presented with shortness of breath, increased sputum production, subjective fevers and abdominal and lower extremity swelling. The patient was mildly hypertensive and had an increased oxygen requirement at presentation but was otherwise hemodynamically stable. In the ED, the patient was treated with 125 mg IV methylprednisolone, empiric IV ceftriaxone and azithromycin and nebulized ipratropium and albuterol. The patient was admitted and was switched to 40mg oral prednisone and oral azithromycin the following day. However, his presentation was also consistent with volume overload secondary to right heart dysfunction requiring treatment with intravenous diuretics. He had improvement in his respiratory status and abdominal and lower extremity swelling over the next four days. During hospitalization, he was also placed on a proton pump inhibitor for worsened heartburn and was placed on a sliding insulin scale for hyperglycemia. He was discharged with an augmented diuretic regimen and pulmonary clinic follow up for COPD management.

Teachable moment

This patient presented to the emergency department with several acute complaints and was treated for acute COPD exacerbation with high dose intravenous corticosteroids. The patient met criteria for a COPD exacerbation with increased shortness of breath, sputum production, wheezing on exam and oxygen requirement. However, he also presented with volume overload related to right heart failure. While the use of corticosteroids is standard treatment for COPD exacerbations, the initial high dose given may have impeded optimal diuresis and contributed to the worsening heartburn and hyperglycemia the patient experienced. The important learning opportunity in this case comes from whether the benefits of corticosteroids outweigh the risks, as well as what the optimal steroid dose and duration should be for patients like ours.

Systemic corticosteroids have been a key component of the treatment strategy for COPD exacerbations since clinical trials demonstrated a quicker recovery time, earlier improvements in lung function and decrease in the length of hospital stay.¹ However, they are not without adverse effects and are a cause of significant morbidity for patients. Corticosteroids are associated with hyperglycemia, hypertension, fluid retention, gastroesophageal reflux or GI bleeding, and increased infection risk. These side effects can be particularly problematic if a patient has diabetes or heart failure and is already predisposed to hyperglycemia or fluid retention. The optimal dose, route of administration, and duration of corticosteroid treatment have all been the subject of numerous clinical studies attempting to evaluate the risks and benefits of steroids in the treatment of COPD. A randomized clinical trial found that a five-day course of systemic corticosteroid treatment was noninferior to a two week course in preventing re-exacerbations.² This finding was further supported by a Cochrane review of eight studies, with an increased incidence of adverse events with longer duration treatment.³ Several studies have shown that

parenteral and oral steroids are effective in the treatment of COPD. Oral versus parenteral prednisolone therapy at a dose of 60mg had similar treatment outcomes with no change in treatment failure (including mortality), improvement of FEV1, or hospital stay between the two groups.⁴ A study comparing oral to both equivalent and higher doses of parenteral treatment had similar findings, with no added benefit found in the group receiving higher parenteral doses⁵. However, these studies excluded patients with a severe exacerbation or respiratory failure and are not applicable to that patient population. However, for our patient who was hemodynamically stable and not in significant respiratory distress, a lower dose of oral steroids would have likely been equally effective. In the case of this patient, and many patients with diabetes, heart failure, and hypertension—among others—less is often more when it comes to corticosteroids for the treatment of COPD exacerbations.

References:

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