



ARTICLE

C-Reactive Protein Testing to Guide Antibiotic Prescribing for COPD Exacerbations

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CLINICAL QUESTION

Can point-of-care testing of C-reactive protein (CRP) be a way to reduce unnecessary use of antibiotics without harming patients who have acute exacerbations of chronic obstructive pulmonary disease (COPD)?

SUMMARY

Roughly half of patients with COPD have one or more exacerbations every year that require treatment with antibiotics, oral glucocorticoids or both. Over prescribing of antibiotics can lead to the development of antibiotic resistance, increase the risk for side effects and alter the microbiome of patients. While some COPD exacerbations may require treatment with antibiotics, others may be triggered by viral or noninfectious causes which do not benefit from treatment with antibiotics. C-reactive protein (CRP) is an acute-phase protein and a biomarker that can be helpful in identifying COPD exacerbations that may benefit from antibiotic therapy. A previous randomized controlled trial of patients with acute exacerbations of COPD showed little difference in outcome in patients with a CRP level of less than 40 mg per liter when treated with either antibiotics or placebo (Llor C et al. 2021). Butler et al. propose the use of point-of-care CRP testing as a possible means to delineate which patients would benefit most from antibiotic therapy; potentially reducing antibiotic prescribing without adversely affecting patient care.

This article describes a multicenter, open-label, randomized, controlled trial of patients 40 years or older diagnosed with COPD who presented with symptoms of an acute exacerbation. A COPD exacerbation was diagnosed based on the patient having at 1-3 Anthonisen criteria (increased dyspnea, increased sputum volume, and increased sputum purulence). Patients were randomized to usual care or point-of-care CRP guided testing. For the point-of-care group, clinicians were provided guidance on the beneficence of antibiotics based on CRP level. Guidance stated that antibiotics were unlikely to be beneficial for CRP levels lower than 20mg liter, may be beneficial for CRP levels 20-40mg per liter if purulent sputum present, and likely to be beneficial for CRP levels higher than 40 mg per liter.

Fewer patients in the CRP guided group received antibiotics than the usual care group (47.7% vs 69.7%) at the initial consultation. Divided by CRP levels, this study showed that 32.8% of patients



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with a CRP less than 20 mg per liter were prescribed antibiotics compared with 84.2% of patients with CRP between 20-40 mg per liter, and 94.7% of patients with CRP >40 mg per liter. There was no difference in the use of other treatments for COPD exacerbation such as oral glucocorticoids. Health status was compared between the CRP-guided group and usual care group with the Clinical COPD Questionnaire at 2 weeks which showed a -0.19 point difference in favor of the CRP guided group. Patients were followed for 6 months of follow-up which showed that health care-seeking behavior or measures of patient well-being did not differ meaningfully at 6 months between either group.

This study suggests that targeted antibiotic usage for COPD exacerbations based on point-of-care CRP testing can decrease unnecessary antibiotic usage without compromising patient-reported disease-specific quality of life.

GROUP OPINION

It is likely that antibiotics are over prescribed in general as AE-COPDs are often triggered by viral or non-infectious causes. This study provides some good evidence that antibiotics can be safely withheld from patients with AE-COPD and low CRP levels. Locally, we see this with increased exacerbation rates with wildfire related air pollution. We would like to see standardization of antibiotics in additional trials and additional studies before all group members would consider changing practice.

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