Chronic Obstructive Pulmonary Disease (COPD) Exacerbations

Diagnosis

- A COPD exacerbation should be considered in a resident with a known history of COPD and increased cough, shortness of breath, or sputum production from baseline.[1-3]
- COPD exacerbations are commonly triggered by respiratory virus infections (e.g., rhinovirus, influenza, COVID-19) and testing for these should be considered.[4]
  - Even if it's not influenza season, test residents who are symptomatic for influenza, especially if two or more develop symptoms within 72 hours of each other.[5]
- Distinguishing COPD exacerbations and community-acquired pneumonia in a resident with a known history of COPD can be challenging.[1,6,7]
  - If a chest x-ray does not show a new infiltrate, a COPD exacerbation is more likely.
- When bacteria are involved with COPD exacerbation, the most common are *Haemophilus influenzae, Moraxella catarrhalis,* and *Streptococcus pneumoniae.*[8,9]
- *Pseudomonas aeruginosa*, *Klebsiella pneumoniae,* and other Gram-negative bacteria are less commonly associated with COPD exacerbations and are usually limited to residents with COPD who have had extensive antibiotic exposure. Sputum culture should be obtained for residents with this risk factor.[1,8,9]

Treatment

- In additional to standard treatment modalities (e.g., bronchodilators, anti-inflammatory agents, anti-cholinergics), antibiotics are generally recommended in patients with new sputum purulence plus either worsened shortness of breath or increased sputum production.[1-3]
- Known adverse events associated with antibiotics should be carefully weighed against the potentially marginal benefits that antibiotics provide prior to prescribing antibiotics to residents with mild COPD exacerbations.[2]
- Empiric treatment[1,2]
  - Azithromycin 500 mg orally once daily for 3 days or doxycycline 100 mg orally twice a day for 5 days[10-17]
    - Azithromycin has a long half-life; 3 days provides coverage for ~ 1 week.[18]
    - Azithromycin and doxycycline are less likely to cause *Clostridioides difficile* infection compared to alternate options[19-21]
  - If a resident recently received azithromycin or doxycycline, or is taking azithromycin prophylaxis, alternate options include amoxicillin/clavulanate or oral second and third generation cephalosporins[22]
  - Fluoroquinolones are discouraged unless the resident has a known history of infection due to organisms resistant to standard therapy.[22]
- Prophylactic antibiotics for individuals with recurrent COPD exacerbations (at least two per year) may result in a modest decrease in the frequency of future exacerbations.[1,23]
  - Prophylaxis should only be considered for residents who are already receiving maximized non-antimicrobial treatment
  - The decision to initiate prophylaxis should be made on a case-by-case basis taking into account frequency of exacerbations, resident preferences, potential risk factors, financial constraints, and input from the resident's pulmonologist and/or primary care practitioner.
- Recommended prophylactic regimens are azithromycin 250 mg orally daily or 500 mg three times a week.[1,23,24]
  - Azithromycin use has been associated with QTc prolongation
  - If Azithromycin prophylaxis is being considered, a baseline electrocardiogram should be obtained and additional QTc prolonging agents should be avoided whenever possible.

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AHRQ Pub. No. 17(21)-0029
June 2021