POEM

Procalcitonin test can reduce antibiotic use in COPD

Clinical question Can procalcitonin levels be used to guide the safe use of antibiotics in patients with a chronic obstructive pulmonary disease (COPD) exacerbation?

Bottom line Procalcitonin can be used to guide the use of antibiotics in patients with exacerbation of COPD. Antibiotics are optional for those with a procalcitonin level between 0.1μg/L and 0.25μg/L and are recommended if the procalcitonin level is greater than 0.25μg/L.

Synopsis Procalcitonin is a biomarker that is elevated in patients with bacterial infection, but not in those with viral infection or other types of inflammation. A previous study (Lancet 2004;363:600) showed that a new, more accurate assay can identify patients with lower respiratory tract infection who are unlikely to benefit from antibiotics. In this study, the researchers identified 226 adults older than 40 years who met standard criteria for an exacerbation of COPD. All patients had their procalcitonin level measured. Patients were then randomised (double blinded but allocation uncertain) into a usual care group or a group that also gave the treating clinicians access to the procalcitonin level. A level less than 0.1μg/L was reported as absence of bacterial infection with no antibiotic recommended; a level between 0.1μg/L and 0.25μg/L was reported as possible bacterial infection with antibiotic use optional; and a level greater than 0.25μg/L was interpreted as bacterial infection with antibiotic use recommended. Clinical success or failure was assessed between two weeks and three weeks after discharge by clinicians blinded to group assignment. Patients were also contacted six months after discharge for a clinical assessment.Of the 226 patients initially randomised, 11 in the procalcitonin group and seven in the standard treatment group were removed from the study because they did not meet criteria for COPD on the basis of inpatient spirometry. Follow-up was excellent up to six months for the remainder of patients. Having access to the procalcitonin test result significantly reduced both antibiotic prescriptions during the hospital admission (40 per cent versus 72 per cent; $P < 0.001$) without any difference in the number of days to the next exacerbation (76 days for each group) or the number of exacerbations or hospital admissions in the next six months. There was no association between procalcitonin levels and the presence of purulent sputum or abnormal sputum cultures. Only 10 patients developed pneumonia, too small a number to draw any conclusions about the effect of procalcitonin guidance on increasing or decreasing the likelihood of pneumonia. There was no significant difference between groups at any point regarding lung function, symptoms, functional status or length of hospital stay.

Level of evidence 1b (individual randomised controlled trial with narrow confidence interval)

Reference Stolz D, Christ-Crain M, Bingisser R, et al. Antibiotic treatment of exacerbations of COPD: a randomized, controlled trial comparing procalcitonin-guidance with standard therapy. Chest 2007;131:9-19.

Funding Industry