Community-Acquired Pneumonia Requiring Hospitalization

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THE AUTHORS REPLY:

As noted by Mizgerd, host factors, including the patient's age, underlying conditions, and immunologic factors resulting from previous exposures and vaccination, play a major role in community-acquired pneumonia.[1] These factors are important areas for future study.

Patients in the EPIC study were hospitalized on the basis of decisions by the treating clinicians, and study personnel had no role in those decisions. Marcos et al. are correct that 70% of enrolled adults in our study had a CURB-65 score of 1 or less (the CURB-65 score, which ranges from 0 to 5, is calculated by assigning 1 point each for new-onset confusion, uremia [blood urea nitrogen >19 mg per deciliter], a high respiratory rate [30 breaths per minute], a low systolic [<90 mm Hg] or diastolic [60 mm Hg] blood pressure, and an age of 65 years, with a higher score indicating a higher risk of death within 30 days), and 65% had a Pneumonia Severity Index (PSI) risk class of 3 or less (on a scale of 1 to 5, with higher classes indicating a greater risk of death; class 1 to 3 indicates a low risk of death, class 4 moderate risk, and class 5 high risk). Together, these ratings indicate a low risk of death at 30 days. However, despite advocacy for the use of these scoring systems for admission decisions, they are not universally applied in clinical practice. Other factors, including underlying conditions, the need for supplemental oxygen, the ability to receive oral antimicrobial agents, the ability of the patient and his or her family to cope with the illness, and concurrent acute medical conditions, often affect admission decisions.[2] Although approximately 30 to 35% of adults with community-acquired pneumonia in the United States are in a higher-risk PSI class (class 4 or 5), an estimated 72% of adults who are evaluated in emergency departments for pneumonia are hospitalized; this highlights the large number of patients with lower severity scores who are hospitalized.[3] It is also important to note that independent of the severity score, 99% of the adults who were enrolled in our study received antibiotics on an inpatient basis, but bacteria were detected

more frequently among patients in the intensive care unit, patients who had a PSI class of 4 or 5, or both.

The comments by Musher and Abers are important in that they highlight the need for improved diagnostic tests to identify known pneumonia pathogens and expand the search for microbes that are not yet identified as being pneumonia pathogens. Comprehensive sequencing approaches and other innovative methods for the discovery of pathogens might contribute to expanded knowledge and improve treatment algorithms at the point of care. We also agree that noninfectious causes could have contributed to illnesses that met the case definition of pneumonia in the EPIC study, since there is overlap between the clinical and radiographic presentation of pneumonia and that of chronic cardiopulmonary diseases.

Finally, as Kaya et al. emphasize, radiologic evaluations can be subjective regardless of the level of experience and clinical training of the radiologist.[4] Our study sought to increase specificity with the use of a common standard of radiographic confirmation in the case definition and study protocol and a single board-certified chest radiologist in each of the two cities where the study was conducted. Review of a 10% random sample of radiographs from adults in our study showed that the interrater percent agreement between the two study radiologists was 86% (95% confidence interval, 81 to 89). The diagnosis and treatment of community-acquired pneumonia remain challenging, and more accurate radiographic and microbiologic diagnostic methods are needed.[5]

References

1. Ellison RT, Donowitz GR. Acute pneumonia. In: Bennett JE, Dolin R, Blaser MJ, eds. Principles and practice of infectious diseases 8th ed. Philadelphia: Elsevier, 2015:823–46.

2. Aujesky D, McCausland JB, Whittle J, Obrosky DS, Yealy DM, Fine MJ. Reasons why emergency department providers do not rely on the Pneumonia Severity Index to determine the initial site of treatment for patients with pneumonia. Clin Infect Dis 2009; 49:e100–8. [PubMed: 19842971]

3. Self WH, Grijalva CG, Zhu Y, et al. Rates of emergency department visits due to pneumonia in the United States, July 2006-June 2009. Acad Emerg Med 2013;20:957–60. [PubMed: 24033659]

4. Cherian T, Mulholland EK, Carlin JB, et al. Standardized interpretation of paediatric chest radiographs for the diagnosis of pneumonia in epidemiological studies. Bull World Health Organ 2005;83:353–9. [PubMed: 15976876]

5. Musher DM, Thorner AR. Community-acquired pneumonia. N Engl J Med 2014;371:1619–28. [PubMed: 25337751]