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Community-Acquired Pneumonia Requiring Hospitalization

Seema Jain, M.D.,

Lyn Finelli, Dr.P.H.,

CDC EPIC Study Team

Centers for Disease Control and Prevention (CDC) Atlanta, GA

The Authors Reply:

We agree with George et al. and Weinberger that there is the potential for clinical and radiographic overlap in the diagnostic criteria for pneumonia and asthma or reactive airway disease.[1,2] Pneumonia is a frequent complication in children hospitalized with asthma or reactive airway disease.[3] Among children with wheezing, reported or documented fever has been associated with pneumonia.[2,4] Children with asthma or reactive airway disease were included if they met enrollment criteria for the EPIC study. The criteria were evidence of acute infection (fevers, chills, hypothermia, or leukocytosis), acute respiratory illness (new cough, sputum production, chest pain, dyspnea, tachypnea, abnormal lung examination, or respiratory failure), and radiographic evidence of pneumonia on hospital admission. The EPIC study radiologists who reviewed the chest radiographs were unaware of the related clinical information. Radiographic evidence of pneumonia was defined as consolidation, other infiltrate, or pleural effusion. Children with radiographs that did not meet these criteria, and children with radiographs with features of asthma only (hyperinflation, peribronchial thickening, or subsegmental atelectasis)[5] were excluded. Among the enrolled children who met the final radiographic criteria, 779 of 2358 (33%) had a history of asthma or reactive airway disease. As compared with children without asthma or reactive airway disease, children with asthma or reactive airway disease had a similar proportion of reported fever (91% vs. 92%, P = 0.88), radiographic infiltrate (52% vs. 48%, P = 0.11), and pleural effusion (12% vs. 14%, P = 0.16) but had more consolidation (62% vs. 57%, P = 0.02). Among the 2222 children with specimens available for bacterial and viral testing, the frequency with which pathogens were detected was much higher in children with asthma or reactive airway disease (84% vs. 80%, P = 0.02). Human rhinoviruses were more common in children with asthma or reactive airway disease (38% vs. 22%, P = 0.02), whereas parainfluenza viruses (5% vs. 8%, P = 0.04), human metapneumovirus (11% vs. 14%, P = 0.04), *Streptococcus pneumoniae* (2% vs. 4%, P = 0.01), and *Staphylococcus aureus* (<1% vs. 1%, P = 0.02) were less common. A similar proportion received antibiotic treatment (88% vs. 89%, P = 0.48).

Although the PERCH study did not require radiographic findings for enrollment[1] and clinical case definitions and methods differed from those in the EPIC study,[1] 90% of the

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children 1 to 59 months of age who were enrolled in the EPIC study had clinical syndromes that were similar to those in the PERCH study according to the study's criteria for severe and very severe pneumonia. However, neither the EPIC study nor the PERCH study was primarily designed to identify children who were more likely to benefit from antibiotics, and treatment was clinician-driven. Further analysis of these etiologic studies will help to inform more focused use of antibiotics. The diagnosis of pneumonia remains challenging; more accurate radiologic and microbiologic diagnostics are needed.[1,2]

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