

Studies Challenge 4-Hour Antibiotic Guideline for CAP

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CHICAGO — Early antibiotic therapy does not improve survival in emergency department patients with community-acquired pneumonia, suggesting that the reallocation of resources for that purpose is unnecessary, according to two studies presented at the annual meeting of the Society for Academic Emergency Medicine.

“Our results suggest that the time to antibiotics in the 0- to 24-hour range has little impact on survival from community-acquired pneumonia,” said Dr. Marie Elie and colleagues at the New Jersey Medical School, Newark.

Largely as a result of a 2004 study (Arch. Intern. Med. 2004;164:637-44), the Centers for Medicare and Medicaid Services and the Joint Commission recommend that patients with community-acquired pneumonia be given an appropriate antibiotic within 4 hours of their arrival in the emergency department.

CMS and the Joint Commission set the measure identification number for this 4-hour guideline as quality measure PN-5b.

The 2004 retrospective study had mined the medical records from a national random sample of 18,000 Medicare patients older than 65 years who were hospitalized with community-acquired pneumonia (CAP) between 1988 and 1999.

Consistent with CMS guidelines, CAP patients in the study were identified as those with a discharge diagnosis between ICD-9 (CAP) codes 480 and 486, and pneumonia diagnosed within 24 hours of ED presentation, in order to distinguish CAP from hospital-acquired pneumonia, said Dr. Elie, director of emergency critical care at New Jersey Medical School.

The study cohort, drawn from three urban New York hospitals, consisted of 4,300 patients given antibiotics within 48 hours of hospital arrival.

The overall mortality rate was 7.6%. For patients with systemic inflammatory response syndrome (SIRS) in the ED, the mortality rate was 12%; without SIRS, it was significantly lower, at 5%. In addition, there was a significant relationship between increasing Acute Physiology and Chronic Health Evaluation (APACHE) II scores and decreasing survival.

There was no statistically significant linear effect of time to antibiotics on mortality, whether time to antibiotics was examined as the only explanatory variable or after adjustment for initial APACHE II score and SIRS.

A second study determined mortality rates and geometric length of stay (GLOS) for adult ED patients admitted to Union Memorial Hospital in Baltimore with a diagnosis of pneumonia.

Mortality rates and GLOS were determined for 1,781 patients and compared annually over 3 years during 2003-2006 with expected mortality rates and expected GLOS calculated using the CareScience risk-adjustment methodology (Quovadx Inc.).

CareScience is an Internet-based risk-adjustment program in which about 150 U.S. hospitals participate; each submitted information about resource use, pharmacy, radiology, device, procedure, discharge diagnosis, and demographics, said Dr. William Frohna, chief of emergency medicine at Union Memorial Hospital.

The retrospective, observational study used patient selection criteria of the Joint Commission's National Hospital Quality Measures, hospital records, and the CareScience database to determine outcomes at a time when performance improvement efforts significantly cut the time to antibiotics in the ED.

In the first of the 3 years, 67% of about 600 patients discharged from the Union Memorial Hospital ED with a diagnosis of pneumonia received an antibiotic within 4 hours. In the second and third years, the percentage rose to 77% and 91%, respectively, Dr. Frohna said.

“Our mortality went from 6.8% in year 1 to 8.4% in year 2, then dropped back to 6.8% in year 3, and the mortality differences were not statistically significant,” he said. The expected mortality rates were 7.6%, 8.1%, and 5.9%.

Geometric length of stay remained below the comparative group and declined each year, from 4.1% to 3.7%.

“Over the 3 years, our performance measure improved as reported to the National Hospital Quality Measures Program. Our mortality rate remained unchanged and our geometric length of stay decreased,” Dr. Frohna said.

The discrepancy between the findings of the New Jersey Medical School and Union Memorial Hospital studies and the 2004 study may be attributable to the fact that the 2004 retrospective study included only Medicare patients older than 65 years, Dr. Frohna explained.

Dr. Frohna cautioned emergency physicians to “be on the front lines of making sure that performance measures actually link to improved outcomes,” and not look the other way while others dictate how they treat their patients. ■

CLINICAL GUIDELINES FOR FAMILY PHYSICIANS

Community-Acquired Pneumonia

BY NEIL S. SKOLNIK, M.D., AND GINA M. MENICHELLO, D.O.

The Infectious Diseases Society of America and American Thoracic Society have published guidelines on managing community-acquired pneumonia (CAP) in adults.

Diagnostic Testing

The diagnosis of CAP requires the presence of an infiltrate on chest x-ray as well as clinical signs and symptoms (such as fever, productive cough, and chest pain). Patients should also be screened for hypoxia with pulse oximetry. For outpatients and hospitalized patients without comorbidities, blood and sputum cultures are optional. If the patient is hospitalized and has comorbidities, pretreatment sputum and blood cultures should be obtained. Patients with severe CAP should have blood and sputum cultures and urinary antigen tests for *Legionella pneumophila* and *Streptococcus pneumoniae*. Urinary antigen testing is also advised for patients who fail outpatient therapy.

Determining Treatment Setting

The CURB-65 criteria (one point each for confusion, uremia, respiratory rate, low blood pressure, age 65 or older) and the Pneumonia Severity Index can be used to determine the treatment setting. A CURB-65 score of 2 would indicate inpatient treatment or intensive home health care services. The scores can be used in conjunction with subjective factors—such as family support at home—in deciding treatment setting.

ICU admission is indicated for patients requiring vasopressors for septic shock or mechanical ventilation. It is also advised for those with severe CAP, defined as three of the following: a respiratory rate of 30, an index of hypoxemia (PaO_2/FiO) of 250, multilobar infiltrates, confusion, uremia, leukopenia, thrombocytopenia, hypothermia, or hypotension.

Outpatient Treatment

► In healthy patients who've had no antibiotics within 3 months, use a macrolide (clarithromycin or erythromycin) or doxycycline.

► In a patient with comorbidities or use of antibiotics within 3 months, use a respiratory fluoroquinolone (moxifloxacin, gemifloxacin, or levofloxacin); or a β -lactam plus a macrolide. High-dose amoxicillin (1 g t.i.d.) or amoxicillin-clavulanate (2 g b.i.d.) is preferred; alternatives include ceftriaxone, cefpodoxime, and cefuroxime (500 mg b.i.d.); doxycycline is an alternative to the macrolide.

► In areas with macrolide-resistant *S. pneumoniae* infection rates greater than 25%, use a respiratory fluoroquinolone or a β -lactam or cephalosporin listed above plus doxycycline in any patient, regardless of comorbidities.

Non-ICU Inpatient Treatment

► For patients admitted to a general medical floor, use a respiratory fluoroquinolone, or the combination of a β -lactam (cefotaxime, ceftriaxone, or ampicillin; ertapenem can be used for selected patients) and macrolide. Ertapenem may be used in patients with risks for anaerobic and drug resistant *S. pneumoniae* infections.

ICU Inpatient Treatment

► In these patients, use a β -lactam (cefotaxime, ceftriaxone, or ampicillin/sulbactam) in combination with azithromycin or a respiratory fluoroquinolone. For those with penicillin allergy, use aztreonam with a fluoroquinolone.

► If *Pseudomonas* infection is suspected, then use an antipseudomococcal, antipseudomonal β -lactam (cefepime, imipenem, or meropenem) with either ciprofloxacin or levofloxacin (750-mg dose). An alternative is the aforementioned β -lactam and an aminoglycoside and azithromycin or a fluoroquinolone. For patients with penicillin allergy, use aztreonam in place of the β -lactam.

► If community-acquired methicillin resistant *Staphylococcus aureus* (MRSA) is suspected, add vancomycin or linezolid.

Special Considerations

For patients with influenza A, treatment with oseltamivir or zanamivir is recommended within 48 hours of symptoms. Those with symptoms for more than 48 hours can be given either medication if they are hospitalized. Patients with suspected influenza who have been exposed to poultry with previous H5N1 infection should be tested for H5N1, placed on droplet precautions, and treated with oseltamivir as well as antibacterials.

Prevention

The pneumococcal polysaccharide vaccine is recommended for those aged at least 65 years old and for younger, high-risk individuals. If given before age 65, a second dose is recommended 5 years after the first. The inactivated influenza vaccine is recommended annually for those aged 50 years old, for younger persons at risk for complications of influenza, for household contacts of high-risk individuals, and for health care workers. The intranasal live attenuated vaccine can be given for ages 5-49 years without chronic medical conditions.

The Bottom Line

- Decide on an appropriate treatment setting.
- Perform diagnostic tests when indicated.
- Start empiric antibiotic therapy.
- Practice preventive measures through immunization of indicated populations.



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