



Effective Health Care

Antibiotic Regimens for Pediatric Community-Acquired Pneumonia Nomination Summary Document

Results of Topic Selection Process & Next Steps

- Antibiotic regimens for pediatric community-acquired pneumonia was found to be addressed by a 2010 Cochrane review and 2011 guidelines from the Pediatric Infectious Diseases Society and Infectious Diseases Society of America. Given that the existing reports cover this nomination, no further activity will be undertaken on this topic.
 - Kabra SK, Lodha R, Pandey RM. Antibiotics for community-acquired pneumonia in children. Cochrane Database of Systematic Reviews 2010, Issue 3. Art. No.: CD004874. DOI: 10.1002/14651858.CD004874.pub3. PMID: 20238334.
<http://www2.cochrane.org/reviews/en/ab004874.html>
 - Bradley JS, Byington CL, Shah SS, Alverson B, Carter ER, Harrison C, Kaplan SL, Mace SE, McCracken GH Jr, Moore MR, St Peter SD, Stockwell JA, Swanson JT. The management of community-acquired pneumonia in infants and children older than 3 months of age: clinical practice guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. Clin Infect Dis. 2011 Oct;53(7):e25-76. PMID: 21880587.
http://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/2011%20CAP%20in%20Children.pdf

- Antibiotic regimens for pediatric community-acquired pneumonia could potentially be considered for new research in comparative effectiveness.

Topic Description

Nominator: Individual

Nomination Summary: The nominator questions the effectiveness of different courses of antibiotics for the treatment of pediatric patients with community-acquired pneumonia.

Staff-Generated PICO

Population(s): Hospitalized pediatric patients (2 months to 17 years) with community-acquired pneumonia

Intervention(s): Antibiotics (administered by intravenous route, intramuscular route, or orally)

Comparator(s): Comparison with another antibiotic

Outcome(s): Clinical recovery, treatment failure rates, relapse, length of hospital stay, need for additional interventions, mortality, cost

Key Questions from Nominator: 1. For pediatric patients with community-acquired pneumonia admitted to the hospital, what is the best antibiotic regimen?

Considerations

- The topic meets EHC Program appropriateness and importance criteria. (For more information, see <http://effectivehealthcare.ahrq.gov/index.cfm/submit-a-suggestion-for-research/how-are-research-topics-chosen/>.)
- Based on the limited evidence available since the publication of the 2010 Cochrane review, it does not appear that a new review would provide additional information at this time.

Importance of New Research

- The choice of antibiotic therapy is generally based on the age of the child, severity of illness, and the likely etiological agent. Besides varying with age, etiological agents also vary by geographic location. The majority of studies conducted on CAP in pediatrics have occurred in developing countries in children below five years of age.
- It appears that comparative effectiveness trials of antimicrobials in children with CAP (identified through WHO diagnostic criteria) with various subgroup inclusion (severity of illness, etc.) and duration of therapy are needed in order to better guide patient treatment.

Research Gaps

- In addition to many of the treatment-related recommendations in the PIDS/IDSA guidelines being based on moderate or weak evidence, the authors outline areas for future research in pediatric CAP related to treatment, including:
 - Enhance the ability to track antimicrobial resistance on local, regional, and national levels and communicate these data in ways that can affect local decisions on selecting the most appropriate antimicrobial at the most appropriate dosage
 - Collect and publish data on the expected response of CAP, by pathogen, to appropriate active antimicrobial agents
 - Conduct more studies on the impact of viral testing on patient outcomes and antibiotic prescribing behavior to potentially limit the use of inappropriate antibiotic treatment
 - Assess the role of antimicrobial therapy for atypical bacterial pathogens in pediatrics, particularly for children <5 years of age
 - Develop clinical trial designs that can provide information on the lowest effective antimicrobial dose for the shortest duration of therapy to decrease the development of antimicrobial resistance and the risk of antimicrobial toxicity
 - Develop clinical trial designs that assess the value of combination antimicrobial therapy for severe pneumonia, including combinations that are designed to decrease toxin production in certain pathogens while also inhibiting growth
- The 2010 Cochrane review titled *Antibiotics for community-acquired pneumonia in children* examined randomized trials published through September 2009 that studied antibiotic treatment in children less than 18 years of age with CAP. Twenty-seven studies were included in the review; however, of these

27 included studies, only 7 were conducted in developed countries. Based on the limited literature from developed countries, the authors of the review state that the general conclusions of the review may be more applicable to the management of pneumonia in developing countries. A scan for literature published since the Cochrane review identified only one additional study conducted in a developed country.

- A scan for recently completed and in-process clinical trials and funding opportunities yielded limited findings, including one ongoing grant to develop a clinical prediction tool to guide CAP treatment in the US and five ongoing or recently completed trials addressing the following topics:
 - Using a Bacterial Pneumonia Scoring tool to guide antibiotic use (Argentina)
 - Doripenem compared with cefepime (International study including the US)
 - Lay health worker treatment with Amoxicillin versus referral to health care center (Pakistan)
 - Amoxicillin given twice or three times a day (Brazil)
 - Procalcitonin measurement to guide treatment (Switzerland)