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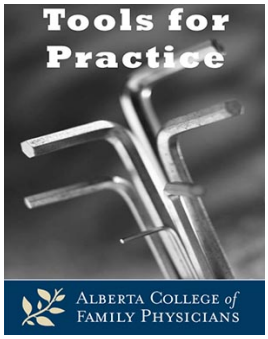
Reviewed: August 2, 2016
Evidence Updated: New evidence
Bottom Line: No change
First Published: October 29, 2012



Amoxicillin, Still an A-List Antibiotic for Infections of the Airway

Clinical Question: When needed, are beta-lactam antibiotics (such as amoxicillin) a reasonable choice in mild-to-moderate bacterial respiratory tract infections in primary care?

Bottom Line: In mild-to-moderate respiratory tract infections that require antibiotics, there is little evidence of benefit of broader-spectrum antibiotics over traditional beta-lactam antibiotics like amoxicillin in primary care. The only exception may be slight benefits for broader-spectrum in COPD patients, but these results are inconsistent.

Evidence:

Overall lower-respiratory tract infections:

- Cochrane review[1] of 16 Randomized Controlled Trials (RCTs) of 2,648 patients with any kind of lower-respiratory tract infection:
  - No statistically significant difference between azithromycin and amoxicillin with/without clavulanate.

Community-acquired pneumonia (CAP):

- Cochrane review:[2] Only one RCT comparing a beta-lactam antibiotic to another antibiotic in outpatients with CAP.
  - Authors could not extract outcome data for this comparison.
- In CAP patients, including those hospitalized:
  - Cochrane review[3] of 28 RCTs (5,939 patients) and two subsequent RCTs:[4,5]
    - No benefit in mortality or clinical efficacy with broader coverage for atypicals compared to beta-lactam monotherapy.

COPD:

- RCT with 137 mild-to-moderately symptomatic primary care patients with acute exacerbation of COPD.[6]
  - No difference in clinical cure between amoxicillin versus amoxicillin/clavulanate (91% versus 93%).

- Systematic review[7] of 12 RCTs including 2,261 patients with chronic bronchitis (not necessarily COPD) compared "first-line" antibiotics (like amoxicillin or doxycycline) versus "second-line" antibiotics (like macrolides and quinolones) for acute exacerbations:
    - Symptom resolution/improvement: 85% for first-line antibiotics versus 91% for second-line (difference statistically significant).
        - Studies ranged from 19% worse to 8% better with first-line antibiotics, no heterogeneity testing was reported.
        - No difference in mortality.

Sinusitis:

- Systematic review[8] of eight RCTs including 2,133 patients found no difference in clinical cure between beta-lactams and fluoroquinolones.
- Two RCTs (total 359 children) compared amoxicillin to amoxicillin-clavulanate for acute sinusitis and neither found benefit with amoxicillin-clavulanate.[9,10]

Context:

- Majority of respiratory tract infections are viral and will not require antibiotics.
- Macrolide resistance in *Streptococcus pneumoniae* is rapidly increasing (2% in 1993 to 24% in 2009), whereas resistance to amoxicillin is just over 3%.[11]
- Limited data report increasing prevalence of *Haemophilus influenza* among upper respiratory tract infections after the introduction of the conjugated pneumococcal vaccine, although clinical impact has not been demonstrated in well-designed RCTs.[12]

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