Antibiotic Resistance
Grand Rounds 2007

Upper Respiratory Infections – Antibiotics or Not?

Stephen Rinderknecht DO
&
James Young MD

Members of the IDPH Antibiotic Resistance Task Force
Agenda

• Introduction and general principles
• Sinusitis
• Bronchitis
• Acute Otitis Media
• Pharyngitis
• Common Cold
• References
General Principles

• Why this is important?

• Separating bacterial complications from the viral process

• Patients should understand the disease

• Proper antibiotic use

• Evidence base practice guidelines
Acute Sinusitis
Caveats

• Children have 2-9 viral respiratory illnesses per year

• In uncomplicated viral illnesses, cough and nasal discharge may persist 14 days or more

• Controlled studies do not support the use of antibiotics in mucopurulent rhinitis

• Antibiotics do not help viral illnesses or prevent complications
Diagnosis

• Only a small percent of viral URI’s are complicated by bacterial sinusitis
  
  – Changes in mucous to yellow, thick or green are natural consequences of URI, and not an indication for antibiotics
Diagnosis (cont.)

• Use strict criteria for diagnosis
  – Persistence of symptoms over 10-14 days without improvement

  – Severe symptoms
    • Fever over 39°C (102°F) with purulent nasal discharge for at least 3-4 days
    • Facial pain or tenderness
    • Periorbital swelling or redness
Diagnosis (cont.)

– Very important to differentiate between successive viral illnesses and, in the mind of parent or patient, persistence of symptoms
Treatment

• Target likely organism with 1\textsuperscript{st} line drugs
  – *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis* most common
  – Amoxicillin 45mg/kg/day
  – If risk factors for resistance (attendance at daycare, recent antibiotic use—less than 90 days, and age less than 2yrs), then consider other choices
Treatment (cont.)

- If no improvement on Amoxicillin (45mg/kg/day) in 48-72 hrs, then:
  - Amox/clavulanate @ 80-90mg/kg/day of Amox plus 6.4mg/kg/day of clavulanate in 2 doses

- If allergic to Amox: (if reaction not type I)
  - Cefdinir 14mg/kg/day in 1-2 doses
  - Cefuroxime 30mg/kg/day in 2 doses
  - Cefpodoxime 10mg/kg/day in 1 dose
Treatment (cont.)

• If type I allergic reaction:
  – Clarithromycin 15mg/kg/day in 2 doses
  – Azithromycin 10mg/kg/ day 1, 5mg/kg/day for 4 days (FDA has not approved this for sinusitis)

• In vomiting child – single dose of ceftriaxone 50mg/kg/day IV or IM

• Nasal saline lavage – universal recommendation, but no good data
Imaging Studies

• Caveat – must interpret studies with caution since some sinus involvement is present with uncomplicated viral URI’s

• Consider in recurrent or unclear cases

• Reserve for patients in whom surgery is being considered
Acute Bronchitis

Current best practice according to CDC, AAP and AAFP
Must Focus on R/O of Pneumonia

• Cough illness is principally viral

• Pneumonia is uncommon in non-elderly, healthy adults without vital sign changes or asymmetric lung sounds

• Chest x-ray needed if above signs present or cough over three weeks
R/O Pneumonia (cont.)

- Chest x-ray not needed in absence of these findings

- Airway inflammation and sputum production are nonspecific responses and do not imply bacterial source
Treatment

• Antibiotic treatment is not advised in acute, uncomplicated bronchitis, regardless of duration of cough. (meta analysis of six random trials)

  – Do not use antibiotics in healthy-appearing child with cough less than 10 to 14 days without signs of pneumonia
Treatment (cont.)

– For prolonged cough (over 10-14 days), consider other diagnoses such as sinusitis which warrant antibiotic

– Antibiotic use in URI’s does not prevent pneumonia or other complications
Treatment (cont.)

- If pertussis is suspected (in children over five years), appropriate tests should be done and appropriate macrolide antibiotic started

- If antibiotics are necessary, use targeted, first-line drugs e.g. amoxicillin, amoxicillin/clavulanate, trimeth/sulfa or macrolide if penicillin allergic
Patients Satisfaction and Demands

- Satisfaction depends on doctor/patient communication rather than on antibiotic Rx.
- Acknowledge patient’s symptoms and discomfort and offer management with non-pharm. agents.
- Give realistic time frame for resolution.
- Explain how risk of antibiotic use outweighs benefits.
Acute Otitis Media
Acute Otitis Media - Diagnosis

• Acute onset, middle ear effusion and signs and symptoms of inflammation of the middle ear

  – Otoscopic changes of effusion
    • Bulging TM, limited mobility, fluid levels, otorrhea

  – Signs/Symptoms of inflammation
    • Opacity (pus) behind TM, erythema of TM
    • Pain referable to the ears
AOM vs OME

• AOM – acute otitis media
  – Fluid and inflammation with symptoms

• OME – otitis media with effusion
  – Fluid without inflammation or symptoms
  – Poor term (uninfected middle ear fluid-better)
  – Normal course of successful AOM management
  – No antibiotics necessary
AOM Observation Option

• Deferring antibiotic treatment for 2-3 days and provide symptomatic relief. Treat only if symptoms persist. An option for:

  – Otherwise healthy children 2yr old and above
  – Not severely ill
  – Assurance of follow up
Antibiotic Management for AOM

• First line therapy
  – Amoxicillin (80-90 mg/kg/day in two divided doses)

• After failure of amoxicillin
  – Amoxicillin-clavulanate 14:1 (80-90 mg/kg/day in 2 divided doses) or
  – Cephalosporin (oral cefdinir, cefuroxime, cefpodoxime, or parental ceftriaxone, 50 mg/kg once daily for 3 days, IM)
Antibiotics Missing from this List

• First generation cephalosporins
  – Cephalexin, Cefadroxil
• Sulfa antibiotics
  – Trimethoprim- sulfamethoxazole
• Macrolides
  – Azithromycin, Clarithromycin
• Quinolones
  – Ciprofloxacin
Pharyngitis
Pharyngitis - Etiology

• Viral

• Group A streptococci (GABS)

• *Corynebacterium diphtheriae*, *Neisseria gonorrhoeae*, group C and G streptococci, etc......
Pharyngitis

- Symptoms of viral and GABS overlap greatly

- Rapid antigen detection test should be done if GABS is suspected

- Only GABS should be treated
Increase Suspicion of GABS When:

- Sudden onset
- Fever
- Pharyngeal inflammation
- Lymphadenopathy
- Abdominal pain, headache
- Patient age 5-15 years
- Winter-spring season
- Lack of cold symptoms
Rapid Testing and Throat Culture

- Children    - Rapid testing
               (culture backup on negatives)

- Adults      - Rapid testing only
Therapy for GABS

- Penicillins
- Cephalosporins
- Macrolides

- Special considerations
  - Treatment failures and recurrent strep
  - Carrier state
Common Cold
(viral rhinosinusitis)

• Diagnosis
  – Classic history
  – Exam findings

• Patient education
  – Symptom relief
  – What’s the expected course?
  – When to call back?
References

Sinusitis


Bronchitis and Common Cold


References (Cont)

Acute Otitis Media

Pharyngitis
Great patient education material available at cdc.gov/getsmtar