Treatment of Common Pediatric Infections

Medical Student Case Discussion
Why are we talking about this?

Antibiotic use is common:
Estimated >30 million prescriptions to children annually\(^1\)

32 million pediatric outpatient visits for respiratory conditions result in antimicrobial prescriptions annually, accounting for >70% of visits resulting in antimicrobial prescriptions.\(^2\)

\(^1\) --McCaig, *JAMA* 2002; *Emerg Infect Dis* 2003
\(^2\) --Hersh, *Pediatrics* 2011
So...is this a problem for me?

Much of this antibiotic use is unnecessary\(^1\)

Amoxicillin use for these infections down 37-49% from 1995-2006; azithromycin up 6-9 fold, fluoroquinolones up 5 fold\(^2\)

Why is this happening?

“WE HAVE MET THE ENEMY AND HE IS US.”
Definition of Judicious Use

• Ensuring the antibiotic is used in the right circumstance, is being used at the right dose, and is given for the right duration-- Arjun Srinivasan, MD, Centers for Disease Control.
<table>
<thead>
<tr>
<th>Contributing Factor</th>
<th>Providers</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of Education</td>
<td>Sub optimal approach to diagnosis and treatment; lack of knowledge of natural history of infection</td>
<td>Insufficient knowledge of viral vs. bacterial infections</td>
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<tr>
<td>Experience</td>
<td>Diagnostic and prescribing habits</td>
<td>Prior antibiotic treatment</td>
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<tr>
<td>Expectations</td>
<td>Belief that patients/parents expect antibiotics &amp; satisfaction is related to prescription</td>
<td>Belief that some conditions require antibiotic therapy (and they don’t)</td>
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<tr>
<td>Economics</td>
<td>Time pressures; incentives linked to patient satisfaction; profiling on return visits</td>
<td>Need to return to work or return child to daycare</td>
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Belongia & Schwartz. 1998
Do they REALLY want antibiotics?

- 50-70% of parents have a pre-visit expectation of antibiotics
- Main reasons to see a physician (child w/ URTI) include:
  - Avoid complications (81%) & physical examination (78%)
  - Rx expectations: symptomatic Rx 50-65%; antibiotics 25%
- Equally satisfied with watch and wait vs. immediate treatment approach
- Patients given a contingency plan more satisfied

1—McCraig JAMA 2002
2—Shlomo BMC Fam Pract 2003
3—Chao Pediatrics 2008; McCormick Pediatrics 2004
4—Mangione-Smith 2001; Arch Pediatr Adolesc Med
What happens in the office

• Physicians more likely to prescribe if:
  • Parents offer possible diagnosis (otitis media; sinusitis)
  • Parents question diagnosis
  • Physicians perceive that the parents want antibiotics

• Positively framed symptomatic treatment recommendations met with more parental agreement

• If the physician states “rule out the need for antibiotics”—increased rate of questioning treatment plan
  • Delegitimize the parent concern
  • Reassurance perceived as minimizing symptoms

Mangione-Smith 2006
Guidelines…The highlights

- Rhinosinusitis
- Streptococcal Pharyngitis
- Community Acquired Pneumonia
- MRSA infections
- UTI
- Acute Otitis Media
Sinusitis

Upper respiratory tract infection

First line therapy: Amox-clavulonate
Streptococcal Pharyngitis-GAS

- Culture or rapid detection necessary to establish diagnosis
- Penicillin or Amoxicillin remain the drugs of choice
  - 10 days
  - PCN 2-3 times a day
  - Amoxicillin 1-2 times a day
- Group A Streptococcal carriers do not need treatment
- Tonsillectomy not recommended to reduce frequency of GAS infections
Community Acquired Pneumonia

- Influenza (+/- other respiratory viral testing) indicated
- No antibacterial treatment w/ proven influenza unless evidence for bacterial co-infection
- Chest X-ray for hospitalized patients
- No routine antibiotics in preschool children
- Amoxicillin for moderate CAP (and suspect bacterial infection)-outpatient
- Ampicillin for initial antibiotics hospitalized patients
- Macrolides for school age/adolescents of suspect M. pneumoniae infection
MRSA-Skin & Soft Tissue

- Drainage
- Antibiotics indicated if rapidly progressive, evidence of extensive disease or other risk factors
- Purulent cellulitis-target CA-MRSA—5-10 days
- Non purulent cellulitis-GAS treatment—5-10 days
- Recurrent disease difficult to manage
- Household treatment may reduce frequency of events
UTI

- Urine culture + urinalysis necessary for diagnosis
- Specimens from bag collection in appropriate
- >50,000 colony forming units of a single pathogen
- IV=oral
- 7-14 days…guided by local resistance patterns
- Febrile children with UTI should have bladder/renal ultrasound
- Routine VCUG not recommended
- Prophylactic antibiotics not recommended for VUR
Acute Otitis Media

• Diagnosis: moderate/severe TM bulging OR new onset otorrhea (no otitis externa); mild bulging + new ear pain or TM erythema

• Manage pain

<table>
<thead>
<tr>
<th>Severity</th>
<th>Age</th>
<th>Treatment*</th>
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<tbody>
<tr>
<td>Severe</td>
<td>&gt;6 months</td>
<td>Amoxicillin</td>
</tr>
<tr>
<td>Bilateral non severe</td>
<td>6 mo-23 mo</td>
<td>Amoxicillin</td>
</tr>
<tr>
<td>Unilateral non severe</td>
<td>6 mo-23 mo</td>
<td>Amoxicillin or OBS</td>
</tr>
<tr>
<td>Non severe AOM</td>
<td>&gt;24 mo</td>
<td>Amoxicillin or OBS</td>
</tr>
</tbody>
</table>

Treatment choices:
1\textsuperscript{st} line = amoxicillin if no antibiotic w/in past 30 days
2\textsuperscript{nd} line = b-lactamase coverage (e.g. Amoxicillin-clavulonate)
Otitis Externa

- Diagnostic Criteria: rapid onset (<48 hours) w/in the last 3 weeks, symptoms of ear canal inflammation & signs of ear canal inflammation
- Topical Therapy
  - Acetic Acid solution (w/ or w/o hydrocortisone)
  - Ciprofloxacin + hydrocortisone or dexamethasone
  - Neomycin, polymyxin, hydrocortisone
  - Ofloxacin
- Pain Management
- No systemic antimicrobials for uncomplicated otitis externa
Global Movement...

**EUROPE’S FIGHT AGAINST**

**ANTIMICROBIAL RESISTANCE**

**WHAT IS ANTIMICROBIAL RESISTANCE (AMR)?**

- **Antimicrobials:** Substances used to treat and prevent a wide range of infections in humans and animals. They work by interfering with the growth and development of bacteria or by destroying them.
- **Antimicrobial resistance:** The ability of microorganisms to withstand antimicrobial treatments. Resistance can develop in bacteria and other microorganisms due to use or misuse of antimicrobial substances.

**OVERVIEW ON RESISTANCE LEVELS IN ANIMALS AND HUMANS**

- Resistance levels in animals to specific microorganisms in Member States and EU.
- Levels of AMR in humans to specific antibiotics in EU.

**HOW DOES EFSA FIGHT AMR?**

- **Scientific support & advice:** EFSA provides scientific advice and support on antimicrobial resistance and resistance to antibiotics in food animals and zoonotic bacteria, and the impact of resistance to human health.
- **Through an integrated approach:** EFSA supports the development of integrated strategies to combat AMR, from policy and regulatory measures to public awareness campaigns.
- **Through close cooperation:** EFSA works closely with other international organizations to address the challenge of AMR, ensuring a coordinated approach to combat this global health threat.

**GET SMART**

- **Getting Smart on Antibiotics:** Tools and strategies for managing antimicrobial resistance.
- **Global Movement:** Collaboration to combat AMR and promote responsible use of antibiotics.

**ANTIBIOTIC AWARENESS WEEK 2015**

- **Preserve the Miracle:** No action today, no cure tomorrow.
- **Get Smart:** Know When Antibiotics Work on the Farm.
Talking Points

- Antibiotics are life-saving drugs
- Antibiotics only treat bacterial infections
- Some ear infections DO NOT require an antibiotic
- Most sore throats DO NOT require an antibiotic
- Green colored mucus is NOT a sign that an antibiotic is needed
- There are potential risks when taking any prescription drug