Otitis Media

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Objectives

• Recognize normal and abnormal tympanic membrane anatomy
• Manage otitis media
• Know referral indications
  – Audiologic
  – Otologic
Normal Anatomy

- Middle ear
- Inner ear
- Child’s eustachian tube
- Eardrum
- Adult’s eustachian tube (approximately at 45° angle)
- Back of throat
Normal Tympanic Membrane

- Color
- Translucency
- Light reflex
- Position
  - Neutral
  - Retracted
  - Full
  - Bulging
- Mobility
- Bony landmarks
Definition of Acute Otitis Media

Recent, usually abrupt, onset of signs and symptoms of middle-ear inflammation and a middle ear effusion.

Signs or symptoms of middle-ear inflammation
1. Distinct erythema
2. Distinct otalgia

Signs of a middle ear effusion:
1. Bulging of the tympanic membrane
2. Limited or absent tympanic membrane mobility
3. Air fluid level behind the tympanic membrane
4. Otorrhea

American Academy of Pediatrics and American Academy of Family Physicians, Clinical Practice Guidelines, 2004
Signs and Symptoms of AOM Specific

• Common
  – Otalgia
  – Otorrhea
  – Hearing loss

• Less common
  – Tinnitus
  – Vertigo
  – Facial paralysis
Risks

• Genetic predisposition
  – Family history of ROM
• Premature birth
• Male gender
• Native American/Inuit ethnicity
• Presence of siblings in the household
• Low socioeconomic status

• Cleft palate
• Down syndrome
• Other craniofacial syndromes
• Exposure to second-hand smoke
Protective Factors

• Breastfeeding for the first 6 months

• Avoid supine bottle-feeding

• Reduce/eliminate pacifier use during age 6-12 months

• Avoidance of passive tobacco smoke
AOM Microbiology

- S. pneumoniae
- H. influenzae
  - (non-typeable)
- M. catarrhalis
- Group A strep
- S. Aureus
- Gram neg. enteric bacilli
  - Up to 20 % of <6 months of age, premature, prolonged hospital stay
  - E. Coli, Klebsiella, Enterobacter, P. aeruginosa
# Acute Otitis Media Management

<table>
<thead>
<tr>
<th>Age</th>
<th>Certain Diagnosis</th>
<th>Uncertain Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6 mo</td>
<td>Antibacterial therapy</td>
<td>Antibacterial therapy</td>
</tr>
<tr>
<td>6 mo–2 y</td>
<td>Antibacterial therapy</td>
<td>Severe illness - antibacterial therapy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-severe illness - observation option</td>
</tr>
<tr>
<td>≥2 y</td>
<td>Severe illness - antibacterial therapy</td>
<td>Observation option</td>
</tr>
<tr>
<td></td>
<td>Non-severe illness - observation option</td>
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</tbody>
</table>

- Observation appropriate only when follow-up can be ensured and antibacterial agents started if symptoms persist or worsen.
- Non-severe illness = mild otalgia and fever <39°C.
- Severe illness = moderate to severe otalgia or fever ≥39°C.
# Antimicrobial Therapy

<table>
<thead>
<tr>
<th>Temp ≥39°C and/or Severe Otalgia</th>
<th>At initial diagnosis with plan for antibiotics</th>
<th>Treatment Failure 48–72 Hours After Initial Management With Observation Option</th>
<th>Treatment Failure 48–72 Hours After Initial Management With Antibacterial Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Recommended Penicillin Allergy</td>
<td>Recommended Penicillin Allergy</td>
<td>Recommended Penicillin Allergy</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin 80–90 mg/kg/day</td>
<td>Non-type I: cefdinir, type I: azithromycin, clarithromycin</td>
<td>Non-type I: cefdinir, type I: azithromycin, clarithromycin erythromycin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amoxicillin 80–90 mg/kg/day</td>
<td>Amoxicillin-clavulanate 90 mg/kg /day</td>
</tr>
<tr>
<td>Yes</td>
<td>Amoxicillin-clavulanate 90 mg/kg/day</td>
<td>Ceftriaxone, Amoxicillin-clavulanate 90 mg/kg/day</td>
<td>Ceftriaxone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ceftriaxone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tympano-centesis clindamycin</td>
</tr>
</tbody>
</table>
Treat otalgia

- Ibuprofen
- Acetaminophen
- Auralgen – antipyrine, benzocaine & glycerin
- Lidocaine
- Otikon Otic solution – herbal extract
Antibiotics?

Benefit

- Shorter duration of illness
- Fewer treatment failures (16 versus 54%)
- Lower rate of residual effusions (50 vs. 63%)

Adverse effects

- Diarrhea (48 vs. 27%, 19% vs. 9%)
- Multidrug resistance
100 children with AOM

- 80 would get better in 3 days without antibiotics
- If all were treated with antibiotics, an addition 12 would likely improve.
- But...
  - 3-10 would get a rash
  - 5-10 would get diarrhea
Antihistamines and decongestants

• May help patients with known or suspected nasal allergies

• Systematic review found decongestants and antihistamines were associated with:
  – Increased side effects
  – Did not improve healing or prevent complications of AOM
  – May prolong the duration of middle ear effusions
Complications Of Otitis Media

• Intratemporal
  – Hearing loss
  – Chronic otitis media
  – Otitis media with effusion
  – Labyrinthitis
  – TM perforation
  – Cholesteatoma
  – Tympanosclerosis
  – Mastoiditis
  – Facial paralysis

• Intracranial
  – Subdural empyema
  – Brain abscess
  – Extradural abscess
  – Lateral sinus thrombosis
  – Otitic hydrocephalus
OME - serous
OME - mucoid Effusion
Incidence of Middle Ear Effusion

• Incidence of otitis media with effusion (OME) after AOM
  – 70% at 2 weeks
  – 40% at 1 month
  – 20% at 2 months
  – 10% at 3 months

• Peak incidence age 2 years

• Most prevalent during the winter months
Otitis Media with Effusion

• After 3 months, consider further treatment
• The decision to treat or observe may be affected by the presence of:
  – Hearing loss
  – Discomfort
  – Vertigo
  – Tympanic membrane changes
  – Frequent episodes of AOM
Tympanosclerosis
Acute Mastoiditis

• Most common 0-3 years of age

• Treatment
  – IV Antibiotics
  – Tympanostomy tube

• If no improvement or secondary complication
  – Mastoidectomy
Perforation

- Susceptible to infection/otorrhea
- May cause hearing loss
Healed Perforation
Retraction Pockets

- Retraction pocket is a localized area of atelectasis with the TM
  - May collect squamous debris
  - At risk for cholesteatoma
Cholesteatoma
Otologic Referral

• Acute otitis unresponsive to appropriate and adequate antimicrobials

• Recurrent acute otitis
  - 4 in last 6 months, 5-6 in last 12 months
  - Unaffected by prophylactic Abx?

• 3 months of bilateral OME or 6 months of unilateral OME unresponsive to Abx

• Speech or language delay associated with recurrent otitis media

• Suspected complication of AOM
Indications for Tympanostomy Tube Insertion

- Recurrent acute otitis media
  - 4 episodes in 6 months or 6 episodes in 12 months
- Bilateral OME for 3-4 months
- Unilateral OME for 6 months
- Eustachian tube dysfunction
- Atelectasis of the TM and retraction pockets
- Suppurative complications of OM
  - Intratemporal
  - Intracranial
Potential Complications of Tube Insertion

• Perforation

• Otorrhea

• Obstruction

• Peritubal granuloma
Thank You
References

- “Ear, Nose and Throat” anatomical chart company, division of Wolters Kluwer Health.