Acute otitis media (AOM) is diagnosed in patients with acute onset, presence of middle ear effusion, physical evidence of middle ear inflammation, and symptoms such as pain, irritability, or fever. AOM is usually a complication of Eustachian tube dysfunction that occurs during an upper respiratory tract infection (Harmes 2014). Acute otitis media belongs to the most common pediatric diseases and is often caused by bacterial infection (Leichtle 2018).

History

History of Present Illness
- Typical pattern is rapid onset of ear pain, fever, irritability.
- Ear symptoms often preceded by upper respiratory symptoms.

Ear Pain

Manifestation of pain in young or preverbal children:
- Ear tugging, rubbing, or holding
- Irritability, excessive crying
- Difficulty sleeping
- Decreased eating
- Other changes in behavior such as decreased playfulness
- (Schilder 2016)

Etiology
- AOM is a multifactorial disease. Infectious, allergic, and environmental factors contribute to otitis media. The most common risk factor is a preceding upper respiratory tract infection.
- *Streptococcus pneumoniae, Haemophilus influenzae* (nontypable), and *Moraxella catarrhalis* are the most common bacterial organisms. Common viral pathogens include the respiratory syncytial virus (RSV), coronaviruses, and influenza viruses. (Danishyer 2023)

Physical Exam Findings

Pathophysiology: AOM begins as an inflammatory process following an upper respiratory tract infection. Due to the constricted anatomical space of the middle ear, the edema caused by the inflammatory process obstructs the Eustachian tube leading to a decrease in ventilation. This leads to a cascade of events resulting in an increase in negative pressure in the middle ear, increasing exudate, and buildup of mucosal secretions, which allows for the colonization of bacterial and viral organisms in the middle ear demonstrated clinically by a bulging or erythematous TM and purulent middle ear fluid. Differentiated from chronic serous otitis media (CSOM), which presents with thick, amber-colored fluid in the middle ear space and a retracted tympanic membrane. Both will yield decreased TM mobility on tympanometry or pneumatic otoscopy. (Danishyar 2023)

General Physical
- Findings may include: fever, irritability, ear-tugging of rubbing

Otoscopic Exam

Common TM findings in AOM:
- Contour – bulging is most consistent sign of AOM, and generally suggests bacterial pathogen
- Color – intense erythema
- Translucency – opaque or cloudy
- Mobility – decreased or absent

Otoscopic Criteria
- Moderate-to-severe bulging of tympanic membrane
- New onset of otorrhea not due to acute otitis externa
- Mild bulging of tympanic membrane and recent (< 48 hours) onset of ear pain (holding, tugging, or rubbing of ear in nonverbal child) or intense erythema of tympanic membrane

Risk Factors
- Age (younger) ~ 80% of all children will experience AOM during their lifetime (Danishyar 2023)
- Allergies
- Craniofacial abnormalities
- Exposure to environmental smoke/respiratory irritants
- Group daycare exposure
- Family history of recurrent AOM
- GERD
- Immunodeficiency
- Pacifier use
- No breast feeding
- Upper respiratory tract infections

(Harmes 2014)

Ancillary Tests

- Lab tests or imaging is not needed.
- Otoscopy findings usually sufficient to confirm AOM diagnosis.
- Tympanometry can supplement pneumatic otoscopy to confirm presence of middle ear effusion.

Treatment Options

The goal of treatment is to control pain and treat bacterial infections with antibiotics. There is limited quality evidence for the use of SMT for children with AOM. There is currently no evidence to support or refute using SMT for OM and no evidence to suggest that SMT produces serious adverse effects for children with OM. (Pohlman 2012)

Pain Management
- Pharmaceutical analgesic agents
- Non-pharmacological:
- External application of heat or cold
- Oil drops in external auditory canal
- Distraction

Referrals
- Recurrent infections requiring antibiotics are clinical evidence of Eustachian tube dysfunction.
- Otolaryngology for consideration of tympanocentesis or tympanosomy tubes.

Treatment Options

Antibiotics

- Antibiotics usually indicated for infants < 6 months old and children at increased risk for complications due to underlying condition.
- Infants with otitis media should be breastfed whenever possible, b/c breast milk contains immunoglobulins that protect infants from foreign pathogens in key phases of early extra-uterine life. (Shetty 2020)
- When necessary, refer patient to an otolaryngologist for surgical procedures (tympanostomy), or an audiologist if child presents with subjective evidence of hearing loss or failure to meet language development marks. Young children with CSOM may have speech and language delays which are managed by a speech therapist.

Prognosis

- The prognosis for most of the patients with otitis media is excellent. (Paradise 2013)
- Effective antibiotic therapy is the mainstay of treatment.

Potential ICD 10 Codes

- **H66.90** = Otitis media, unspecified, unspecified ear
- **H60-H95** = Diseases of the ear and mastoid process
- **H66** = Suppurative and unspecified otitis media
- **H66.9** = Otitis media, unspecified

DDX List for this Condition

- Otitis media with effusion -
- Chronic suppurative otitis media
- Acute otitis externa
- Upper respiratory infection
- Other causes of fever without localizing signs

Author(s)

- Leslie Fuller, ND

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