PEDIATRIC ACUTE OTITIS MEDIA

DEFINITION

An acute suppurative infection of the middle ear, often preceded by a viral upper respiratory tract infection (URTI).

Nurses with Remote Practice Certified Practice designation (RN(C)s[1]) are able to treat children with acute otitis media who are **6 months of age and older.**

POTENTIAL CAUSES

Viral Organisms

- Respiratory syncytial virus (RSV)
- Picornaviruses (rhinovirus, enterovirus)
- Influenza viruses
- Coronaviruses
- Adenovirus
- Human metapneumovirus.

Common Bacterial Organisms

- *Streptococcus pneumoniae*
- *Moraxella catarrhalis*
- *Hemophilus influenzae*
- *Pseudomonas aeruginosa*
- *Staphylococcus aureus*
- *Streptococcus pyogenes*

Less Common Organisms

- Mycoplasma
- Chlamydia

Other Miscellaneous Causes

- Immunoreactivity

[1] RN(C) is an authorized title recommended by CRNBC that refers to CRNBC-certified RNs, and is used throughout this Decision Support Tool (DST).

- Allergic rhinitis

PREDISPOSING RISK FACTORS

- Age – most frequent between 3 months to 3 years old (most important risk factor)
- Eustachian tube dysfunction
- Upper respiratory infection
- Allergies
- Cleft palate
- Immunosuppression
- Children exposed to cigarette smoke
- Children with Down syndrome
- Day care environment
- Children of Indigenous origin (eustachian tubes shorter and wider)
- Possibly bottle-fed children, if the child is propped up for feeding or goes to sleep with a bottle of milk at night
- Children who use pacifiers when sleeping at night
- Fall and winter months

TYPICAL FINDINGS OF OTITIS MEDIA

History

- Otalgia (pain is absent in 20% of children)
- Fever
- Irritability
- Sensation of fullness
- Hearing decreased
- Tinnitus or roaring in ear
- Vertigo
- History of upper respiratory tract symptoms
- Tugging at ears
- Vomiting or diarrhea may be present
- Restless sleep
- Anorexia

Physical Assessment

- Vital signs. May be febrile.
- Weigh until 12 years of age for medication calculations
- May appear acutely ill
- Tympanic membrane red, dull, bulging
- Bony landmarks obscured or absent
- Purulent discharge if drum perforated
- Decreased mobility of tympanic membrane (pneumatic otoscope) (appendix 1)
- Bullae seen on tympanic membrane
- Peri-auricular and anterior cervical nodes enlarged and tender
- When safe to do so, wax and other debris should be removed from the ear canal to allow a clear view of the tympanic membrane
- Redness of the tympanic membrane in the absence of other signs may be due to crying, agitation, a common cold, aggressive examination or manipulation of the external ear canal, or serous otitis media with effusion

Diagnostic Tests

- Swab any drainage for culture and sensitivity

MANAGEMENT AND INTERVENTIONS

Goals of Treatment

- Control pain and fever
- Relieve infection
- Prevent complications
- Avoid unnecessary use of antibiotics

Non-Pharmacologic Interventions

- None

Pharmacologic Interventions

Note: All drugs must be calculated by weight. Doses should not exceed recommended adult doses.

To relieve pain and fever: Acetaminophen

PO acetaminophen for pain/fever (calculate 10 – 15 mg/kg/**dose**; q4-6h)

PR acetaminophen for pain/fever (calculate 10 – 20 mg/kg/**dose**; q4-6h)

max from all sources: acetaminophen 75 mg/kg in 24 hours or 4,000 mg in 24 hours, whichever is less

To relieve pain and fever: Non Steroidal Anti-Inflammatory Drugs (NSAIDs)

PO ibuprofen for pain/fever [caution-renal]

- Less than 6 months of age: calculate 5 mg/kg/**dose**; q8h
- Greater than/equal to 6 months to 12 years: calculate 5 – 10 mg/kg/**dose**; q6-8h; **max 400 mg/dose**
- Greater than 12 years: 200 – 400 mg/**dose**; q4-6h; **max 400 mg/dose**

Max from all sources: ibuprofen 40 mg/kg in 24 hours or 2,400 mg in 24 hours, whichever is less

PO Naproxen BID (calculate 5 – 10 mg/kg/dose**;** max 500 mg/dose**)**

Oral Antibiotic Therapy:

In 70% of cases, acute otitis media resolves on its own with supportive care only.

- Do not initially give antibiotics for children 6 months and older:
    - If the child is otherwise healthy;
    - if the child is easily followed;
    - if the symptoms are mild (mild otalgia, untreated fever less than 38.5' Celsius); and
    - if the child is non-toxic.

  For these children:
    - manage pain aggressively and keep well hydrated; and
    - if not improved in 2 days commence antibiotic therapy.

- For children 6 months and older, institute antibiotics without waiting if:
    - Severe otalgia and / or irritability lasting longer than 24 hours;
    - Fever higher than 38.5' Celsius;
    - Tympanic perforation;
    - Bilateral AOM;
    - Antibiotic use for AOM in the previous 3 months;
    - Presence of co-morbidities such as tonsillitis, which requires treatment; and
    - Children who will not be able to be re-examined in 2-3 days,

- Oral antibiotic therapy:
    - A 5-day course is appropriate for children greater than 2 years with uncomplicated acute otitis media; for younger children or children of any age with complications (e.g., perforated eardrum) a 10-day course is appropriate.
        - amoxicillin (standard dose) 40mg-50mg/kg per day, po divided tid for 5-10 days. Maximum dose 1,500mg/day

OR

- amoxicillin-clavulanate (4:1 formulation) 40 mg/kg/day divided TID for 5-10 days. Dosing based on amoxicillin, max dose 1500 mg/day.

- If recurrent infection in less than 3 months or if symptoms fail to respond after 48 hours of treatment with initial antibiotics then:
  - amoxicillin (high dose) 80mg/kg/day, po divided tid for 5-10 days. Maximum dose 1,500mg/day

OR

- amoxicillin-clavulanate (7:1 formulation) 45 mg/kg/day divided bid for 5-10 days. Maximum amoxicillin dose of 1500 mg/day

For clients with allergies to the above antibiotics, previous antibiotic use within a month, or unavailability of the previously listed antibioitics:

- azithromycin 10 mg/kg/day once on first day, then 5 mg/kg/day once daily for four days.
- Cefuroxime 15mg/kg/dose PO bid. Maximum dose 1,000mg/day

Pregnant

- DO NOT USE ibuprofen

Pregnant and Breastfeeding Women

- Acetaminophen, amoxicillin, amoxicillin-clavulanate and azithromycin may be used as listed above.

POTENTIAL COMPLICATIONS

- Perforated tympanic membrane
- Serous otitis media
- Mastoiditis (rare)
- Meningitis (rare)
- Facial paralysis

CLIENT/CAREGIVER EDUCATION AND DISCHARGE INFORMATION

- Advise on condition, timeline of treatment and expected course of disease process
- Recommend increased rest in the acute febrile phase
- Counsel parents or caregiver about appropriate use of medications (dosage, compliance, follow-up)
- Recommend avoidance of flying until symptoms have resolved

- Avoid feeding in a flat supine position
- Breast feeding recommended
- Avoid tobacco smoke
- Frequent and thorough hand washing
- Update immunizations if necessary
- Antihistamines and decongestants have no proven efficacy in the treatment of acute otitis media and should be avoided.

MONITORING AND FOLLOW-UP

- Advise caregiver of follow up if condition does not improved in 48 hours or sooner if condition deteriorates
- Otherwise, follow up in 14 days:
  - If ear is normal, do not give any treatment
  - If ear is still dull but asymptomatic (no pain or hearing loss), follow-up again in 6 weeks
  - If condition is unresolved, consider treatment with a second-line antibiotic
  - Look for development of serous otitis media
- In 70% to 80% of clients, effusion persists after 2 weeks, and 10% still have effusion at 3 months and may exhibit conductive loss of hearing

CONSULTATION AND/OR REFERRAL

- More than 3 infections in 6 months or 4 infections in one year
- Consult with a physician or nurse practitioner if there is no improvement in symptoms or condition worsens within 24-48 hours.
- Hearing should be assessed by audiologist, community health nurse or other appropriate professional 1 month after treatment is complete if the child has had two or more cases of AOM.

DOCUMENTATION

- As per agency policy

REFERENCES

More recent editions of any of the items in the Reference List may have been published since this DST was published. If you have a newer version, please use it.

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