

# Evidence Based Medicine

## An Evidence Based Approach to the Management of Uncomplicated Acute Otitis Media in Children

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**E**ighty-nine percent of children have an episode of acute otitis media (AOM) by age 3. In 1990 more than 20 million antibacterial prescriptions were written in the United States for the treatment of otitis media. While it appears that usually otitis media resolves without treatment, there is a wide variation in the use of antibiotics for AOM in doctors from different countries from as low as 31% in the Netherlands to 98% in the USA and Australia.

The American Academy of Family Physicians and The American Academy of Pediatrics recently released an evidence-based practice guideline for the care of children with AOM. That guideline as well as abstracts from the Cochrane Database of Systematic Reviews will be summarized in this article.

A diagnosis of AOM requires 3 elements:

- A history of *acute* onset
- The presence of middle ear effusion ( bulging of the tympanic membrane (TM), loss of normal landmarks, change in color, limited mobility of TM with pneumatic otoscopy, fluid visualized behind the TM or otorrhea )
- Symptoms or signs of middle ear inflammation (fever, earache, tugging and rubbing ear, irritability, restless sleep or erythema of TM.)

Discriminating between AOM and otitis media with effusion (OME) is a challenge for practitioners. When OME is mistakenly identified as AOM, antibacterial agents may be prescribed erroneously.

### Management of AOM

#### *Pain*

The assessment and treatment of pain is important regardless of the use of antibacterial agents. Acetaminophen and ibuprofen are recommended.

- *Home remedies:* No controlled studies have evaluated the effectiveness of home remedies such as external application of heat or cold, or oil.
- *Topical agents:* Benzocaine or naturopathic agents such as Otikon Otic Solution have some brief additional benefits.
- *Homeopathic Agents:* No controlled studies have directly assessed homeopathic agents.

#### *Decongestants, Antihistamines and Mucolytics*

- *Decongestants or antihistamines alone:* A Cochrane review of 2,695 patients showed no additional benefit in intervention subgroups treated with decongestants or antihistamines.
- *Combined decongestant and antihistamine:* In this group there was a statistically lower rate of persistent AOM at two weeks, but this was of small clinical significance, with no early cures, symptom resolution, prevention of surgery or prevention of other complications. There was an increase in medication side effects.
- *Mucolytics:* There has been no evidence to support the use of mucolytics.

#### *Use of Antibiotics*

A Cochrane Central Register of Controlled Trials searched from a list of articles published 1958 to 2000 and updated in 2003. Randomized trials comparing antimicrobial drugs with placebo in children with AOM were selected. The reviews concluded that antibiotics provide only a small benefit for AOM in children.

#### *Conclusions*

- Most cases resolve spontaneously and so this benefit must be weighed against the risks of possible adverse reactions.

- Antibiotics do not alter pain within the first day and only slightly reduce pain in the following days.
- Antibiotics have no effect on tympanometry, audiometry, contra lateral otitis or rate of recurrence.
- About 17 children with AOM would need to be treated with broad spectrum antibiotics versus no antibiotic treatment to avoid a clinical failure.
- Antibacterial side effects are common affecting 5-10% of children and the development of antibacterial resistance is of concern.
- Antibiotics may be necessary in the very young (younger than 2 years) or in severe or prolonged cases.

### Guidelines for Observation without the Use of Antibiotics

Observation without the use of antimicrobial agents in a child with uncomplicated AOM is an option. This option is based upon diagnostic certainty, age, illness severity and assurance of follow-up. The observation option is a 48-72 hour period of symptomatic treatment (analgesia) without antibiotics, followed by reexamination. For an observation option to be considered the parent must be able to communicate with the physician and have access to immediate follow-up care as needed.

Infants younger than 6 months should receive antibiotics, but children aged 6 months to 2 years should receive antibiotics if the diagnosis is certain. Children aged 2 years and older should receive antibiotics if the diagnosis is certain and the illness is severe. If the diagnosis is certain and the illness is not severe, an observation period is an option. If the diagnosis is uncertain, an observation period can be considered for non-severe illness and antibiotic therapy can be considered for severe illness.

### Choice of Antibiotics

Common pathogens in AOM are *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis*. If a decision is made to treat with an antibacterial agent then:

- *For most children:* amoxicillin should be prescribed because of its low cost, general effectiveness against susceptible organisms, as well as its safety

and acceptable taste. The dose is 40-45mg/kg orally twice a day.

- *For severely ill children or if coverage for H. influenzae and M. catarrhalis is needed:* amoxicillin-clavulanate should be prescribed. The dose is 45 mg/kg amoxicillin and 3.2 mg/kg clavulanate twice a day.
- *If the child has type 1 penicillin allergy (urticaria or anaphylaxis):* erythromycin-sulfisoxazole, sulfamethoxazole-trimethoprim, azithromycin or clarithromycin should be used.
- *If the child has type 2 penicillin allergy:* cefdinir or cefepoxide or ceftriaxone should be used.

### Length of Treatment

A Cochrane review of 30 trials found that 5 days of antibiotic is as effective as 8-10 days in uncomplicated ear infections in children. However, for infants and very young children with severe AOM the optimum duration is unknown. For children younger than 2 and possibly children 2-5 a standard 10 day therapy is still recommended. A standard 10 day course of therapy is also recommended for children with severe illness.

### Prevention

- Attention to child care attendance patterns with a resultant reduction in respiratory tract infections appears to be helpful.
- Breast-feeding during the first 6 months appears to be helpful.
- Avoidance of supine bottle-feeding, eliminating the pacifier and eliminating exposure to tobacco smoke have all been postulated to be helpful against early episodes of AOM, but the utility of these interventions are still unclear.
- Influenza vaccines have demonstrated a 30% efficacy in prevention of AOM, but only during the respiratory illness season and only in children older than 2.
- Pneumococcal conjugate vaccines are effective in preventing vaccine-serotype pneumococcal otitis media, but their overall benefit is small with only a 6% reduction in incidence of AOM. Large scale use of pneumococcal vaccine to prevent AOM is not recommended.

## Complimentary and Alternative Medicines (CAM)

To date, there have been no studies to show a beneficial effect of homeopathy, acupuncture, herbal remedies, chiropractic treatments, or nutritional supplements and as such no recommendations can be made regarding the use of CAM for AOM

The diagnosis of AOM should be confirmed by a history of acute onset, signs of middle ear effusion and signs and symptoms of inflammation of the middle ear. The management of AOM must include the assessment and management of pain. Decongestants, antihistamines and mucolytics have not been shown to be clinically useful.

Observation without the use of antibiotics is an option in certain children, depending on age, severity of illness, and the assurance of follow-up. If antibiotics are prescribed, amoxicillin in the dosage of 80-90 mg/kg/day should be used as first line treatment. The reduction of risk factors is likely to be helpful.

## References

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