Does Treatment with Antibiotics Reduce the Duration or Severity of Symptoms of Acute Otitis Media in Children as Compared to Treatment with Analgesics Alone?

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Answer: Reduces duration of AOM symptoms: maybe.

Reduces severity of AOM symptoms: maybe.

Date answer was determined: January 1, 2005

The level of evidence: RCT, Meta-analysis of randomized trials comparing....

Summary of the issues:

Acute otitis media (AOM) is the most common infection for which antibacterial agents are prescribed for children in the United States.[1] AOM is defined as the presence of middle ear effusion in conjunction with the rapid onset of one or more signs or symptoms of inflammation of the middle ear. Uncomplicated AOM is defined as AOM limited to the middle ear cleft.[2]

We spend billions of dollars both directly (i.e.: cost of antibiotics, doctor fees) and indirectly (i.e.: time lost from work) treating this condition every year. (In 1995 the dollar amount was estimated at $2.98 billion.[2]) At the same time, we are seeing a rise in antibiotic resistant organisms.[3] At this time the benefit of routine anti-microbial use for AOM, judged by either short- or long-term outcomes, is unproved.[3] It is entirely possible that we are causing more harm by giving antibiotics than by treating AOM symptomatically. The American Academy of Pediatrics (AAP) and the American Academy of Family Practice (AAFP) released new guidelines for treating AOM in 2004 which include an observation period when considering antibiotic treatment of uncomplicated AOM.

Summary of the evidence:

Takata, et al. (2001)[4] performed a meta-analysis searching seven electronic databases for articles published between 1966 and March of 1999 regarding the management of acute otitis media. Five studies reported the clinical failure rate at 1 to 7 days on a total of 739 children who were not treated with antibiotics, yielding a pooled clinical failure rate of 19% (95% CI 10% to 28%). Using only those studies that followed up at 4 to 7 days, the pooled clinical failure rate estimate was 22% (95% CI 4% to 20%), based on 3 studies and 220 children. Thus around 80% of uncomplicated cases of AOM resolve spontaneously, within a week, without apparent suppurative complications.

Del Mar, et al. (1997)[5] performed a meta-analysis of six studies. Their conclusions were similar to Takata's. They also found that the majority of uncomplicated cases of AOM would resolve spontaneously. Of 633 children, 60.3% of placebo treated children and 61.0% of antibiotic treated children were pain free within 24 hours of presentation. Of 1833 children observed 2 to 7 days after presentation, 85.7% of those in placebo groups and 90.3% of those treated early with antibiotics were pain free. Thus early use of antibiotics reduced the risk of pain by 41% (CI 14% to 60%). To prevent one child from experiencing pain 2 to 7 days after presentation, 21 children would have to be treated with antibiotics early.

Few studies have measured the duration of AOM symptoms such as pain (as opposed to presence/absence at follow up).[6] In one study with 232 children, the average duration of pain in children with AOM was 2.8 days if treated with antibiotics versus 3.3 days if not (statistically non-significant), though the reduction in the duration of crying was significant (0.5 days versus 1.4 days, $p < 0.001$).[7] In a second study with 240 children, the median number of daily doses of analgesics needed was less in children given antibiotics (2) compared to controls (3), $p < 0.004$.[8]

Based on the reviews of the evidence that we found, though most cases of uncomplicated AOM resolve in a few days, antibiotics can slightly reduce the number of clinical failures (reported as pain, fever and middle ear effusion) at 1 to 7 days. There is no evidence to support any particular antibiotic regimens as more effective at relieving symptoms. No randomized studies were found that demonstrated differences in outcomes due to increased antibiotic resistance.

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Recommendations:

Weighing the theorized disadvantages of use of antibiotics for AOM against the evidence that most AOM resolves spontaneously and that antibiotics produce only a slight reduction in probability of having pain after several days, recent guidelines suggest physicians encourage parents to wait and see if the AOM resolves spontaneously. The AAP and the AAFP recommend analgesia for the treatment of otalgia during an initial observation period (48-72 hours is suggested) when antibiotics are to be deferred. If the child does not improve or if the child's condition were to worsen antibiotic therapy should be started.[1,2]

The AAFP.org recommends telling parents the following justification for limiting the use of antibiotics for AOM: "Giving your child unnecessary antibiotics can be harmful. After each course of antibiotics, the germs in the nose and throat are more likely to become resistant. The usual antibiotics can't kill resistant germs. More expensive and powerful antibiotics have to be used. Some of these antibiotics must be given in the hospital and their side effects can be very unpleasant or even dangerous. Since fluid in the ears doesn't usually bother children, it's better to wait and only give antibiotics when they're necessary."[9]

Search terms:

Human studies, AOM, antibiotics, analgesics, pediatric, cost, antibiotic resistance. Search was made in Cochrane Controlled Trials Register, MEDLINE, Index Medicus, OVID, Google, NCBI, NLM, AAFP and AAP.

Exclusions:

Studies on patients with immunodeficiencies or craniofacial deficiencies.

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