What is the Role of Tympanostomy Tubes in the Treatment Of Recurrent Acute Otitis Media?

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BACKGROUND

Approximately 90% of children will experience at least one bout of acute otitis media (AOM). An infection will most commonly occur within the first 2 years of life, with the highest incidence between 6 to 12 months of age. Recurrent AOM (rAOM) is generally defined as a child having a minimum of three bouts of AOM in a 6-month period or four bouts in 1 year. Treatment options for children with rAOM include episodic treatment with analgesics alone or antibiotics, prophylactic antibiotic therapy, or myringotomy with or without tympanostomy tube (TT) placement. Current guidelines by the American Academy of Pediatrics and the American Academy of Otolaryngology–Head and Neck Surgery are outlined in Table I.

LITERATURE REVIEW

McDonald et al. performed a literature review for randomized controlled trials comparing TT placement versus a control population for the treatment of rAOM. In their methods they state that the control population could include treatment with antibiotics, other therapies besides TT, or no therapy at all. The age range looked at was 0 to 16 years old. They included a variety of databases for the search and did not limit it to PubMed, English language, or date of publication. Five studies were found that were randomized controlled trials, two of those fulfilled their inclusion criteria for analysis. One of the included studies looked at the difference between TT placement and no treatment for rAOM and found that TT insertion resulted in a statistically significant reduction of episodes of AOM by 1.5 in the first 6 months after treatment. The other included study compared TT placement versus prophylactic antibiotic treatment and found no statistically significant difference between the two groups, although there was a trend toward TT leading to fewer bouts of AOM compared to antibiotic prophylaxis. The conclusion from this review was that TT placement for rAOM in children 3 years and younger reduces the number of bouts of AOM compared to controls. Of note, only the first study discussed had a statistically significant difference, and the control population received no therapy. The patients from the two included studies could not be combined for analysis because the control groups differed in therapy.

Hellstrom et al. reviewed the literature for studies looking at the effectiveness of TT placement for serous otitis media and rAOM. PubMed, Cochrane Library, and Embase databases were included in the search as well as works cited in the publications. The search was limited by language and to the years 1966 to 2007. The types of studies included were randomized controlled, nonrandomized controlled, and cohorts. Three studies were found to meet their criteria for review. Hellstrom et al. found that two of these studies—one of which was used in the McDonald et al. review—demonstrated a decrease in rAOM with the use of TT compared to no treatment, but the review concluded that the number of patients included in the study was too small to draw a clear conclusion. The third study, by Casselbrant et al., randomized children between 7 and 35 months of age who had rAOM to either placebo, amoxicillin prophylaxis, or TT. No significant difference in rate of AOM was found between TT placement and placebo. Percentage of time spent with AOM was significantly less in the TT and amoxicillin group compared to placebo, but no significant difference was found between TT placement and amoxicillin use. The recommendation was to consider antibiotic prophylaxis as a first-line therapy and TT placement as a second-line therapy. The conclusion of the review was that there is insufficient evidence to support TT placement for rAOM.

Rosenfeld assessed the surgical benefits of TTs versus no surgery for the prevention of AOM through a meta-
analysis of five randomized controlled trials. Conclusions drawn from the analysis were that TT placement had the greatest benefit in reducing the number of AOM episodes in the first 6 to 12 months after insertion. Placement led to improvements in quality of life to a large extent in 56% of patients, moderate extent in 15%, and small extent in 8%. The greatest benefits were found in pain reduction, caregiver concerns, emotional distress, and hearing loss. Four percent of patients had a poorer quality of life after TT placement. The patient populations in these studies varied from having AOM with and without middle ear effusions and those with otitis media with effusion alone. This variability in patients' parameters makes conclusions drawn from the meta-analysis hard to interpret.

**BEST PRACTICE**

The American Academy of Otolaryngology–Head and Neck Surgery's guidelines recommend TT treatment in cases of rAOM (Table I). Currently, there is limited evidence to strongly support the use of TT over medical therapy for rAOM. Given that AOM is very common in children and that TT placement is also common, a large, randomized, controlled study is needed, as is suggested by the American Academy of Pediatrics guidelines for treatment of acute otitis media (Table I). Surgical intervention should be considered as second-line treatment if medical therapy fails. Alternatively, if a child with rAOM is very symptomatic, the use of TT may improve some quality-of-life parameters.

**LEVEL OF EVIDENCE**

Although there are several randomized controlled trials assessing the role of TT for middle ear disease, there is only one that looked at rAOM without inclusion of middle ear effusions. The results of this study did not show a significant advantage over antimicrobial prophylaxis. Meta-analysis showed some advantages to TT placement compared to no surgery but included a heterogeneous population. The level of evidence is 1b given there is an individual, randomized, controlled trial.

**BIBLIOGRAPHY**


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