New novel approaches are necessary to address the emerging problem of the condition who fail conventional therapy for acute otorrhea following tympanostomy tube insertion. We’ve seen an increase in the number of children with otorrhea through a tympanostomy tube lasting more than 10 days in the past few years, primarily due to the emergence of community-acquired methicillin-resistant Staphylococcus aureus (CA-MRSA). Another contributing factor is the increased use of quinolone ear drops, which are thought to promote the occurrence of fungal infections. Approximately 30% of children who undergo tube placement develop acute otorrhea. Haemophilus influenzae and Streptococcus pneumoniae are responsible for 40%-45% of these cases, particularly in children under 2 years of age and in those who develop symptoms during the winter months. It’s hypothesized that these children have ongoing eustachian tube dysfunction that permits nasopharyngeal pathogens to ascend to the middle ear, resulting in acute otorrhea through the tympanostomy tube.

The other 55%-60% of cases are caused by pathogens from the external canal, most commonly Staphylococcus aureus and Pseudomonas aeruginosa. These patients tend to be older, to develop symptoms during the warmer months, and have a malodorous discharge (in contrast to the odorless). They tend to be older, to develop symptoms during the warmer months, and have a malodorous discharge (in contrast to the odorless). These patients (five with prior tympanostomy tube placement and one with perforation of the tympanic membrane) who had failed either oral antibiotics or fluoroquinolone ear drops alone (Arch. Otolaryngol. Head Neck Surg. 2005;131:868-73).

For MRSA-associated skin and soft tissue infections, drugs such as trimethoprim-sulfamethoxazole, linezolid, or even intravenous vancomycin are usually effective. However, these agents are often ineffective or associated with relapse as soon as therapy is discontinued when a foreign body such as a tympanostomy tube is involved, because of the lack of blood supply and the formation of biofilm.

What does appear to work, at least in small case reports, is the use of either topical vancomycin or combination topical plus oral treatment. In one report, a group in Thailand combined a 500-mg vial of vancomycin powder with 20 mL of sterile distilled water to create a 25 mg/mL vancomycin solution. Two 0.8-mg drops were placed into the ear three times daily for 10 days in patients with MRSA otorrhea. A control group of 20 patients was treated with the same regimen of gentamicin 0.3% drops (J. Laryngol. Otol. 2004;114:645-7). Clinical cure was achieved in 30 (86%) of the vancomycin recipients, compared with 2 (10%) of those treated with gentamicin. Failures occurred in just 2% (6%) of the vancomycin recipients versus 16% (50%) of the gentamicin recipients. Of course, this is a small study, but it is based on sound biologic principles and there appear to be no adverse effects. We certainly need more long-term data, but I think topical vancomycin may represent a good alternative to removal of the tubes in some patients. If your pharmacy is able to make this formulation, I think it offers an option to tube removal if CA-MRSA is cultured and the child fails initial oral or topical therapy. In another small study, successful eradication of MRSA was achieved using a combination of oral trimethoprim-sulfamethoxazole plus topical gentamicin or polymyxin B sulfate-neomycin-sulfate-hydrocortisone (Cortisporin) in six children (five with prior tympanostomy tube placement and one with perforation of the tympanic membrane) who had failed either oral antibiotics or fluoroquinolone ear drops alone (Arch. Otolaryngol. Head Neck Surg. 2005;131:782-4). However, I’d be less apt to use this approach because of concerns about potential ototoxicity of the gentamicin/neomycin on the vestibular system.

In addition to CA-MRSA, otorrhea due to fungal organisms is now being seen increasingly in children who have been treated previously for bacterial infections following tube placement. In a retrospective review conducted at a pediatric otolaryngology clinic, out of a total 1,242 patients who underwent ear tube placement between 1996 and 2003, 203 patients (19 with otitis media, 41 with otitis externa, and 6 with both) aged 16 days to 18 years (mean age 5.9 years) were found to have fungal organisms. The proportion of fungus-positive cultures increased dramatically in the years following the availability of the fluoroquinolone drops, from just 4.2% of 356 cultures obtained during 1996-1998 to 18.2% of the 457 cultures done during 1999-2001 (Int. J. Pediatr. Otorhinolaryngol. 2005;69:1903-8).

The most common of the fungi were Candida albicans (43% of the 166), Candida parapsilosis (23.5%), and Aspergillus fumigatus (21%). Although reporting of studies on the treatment of fungal infections is spotty, it is estimated that the patients who previously received an average of 1.7 oral antibiotics and 1.1 ototopical agents before the culture was taken. Infection resolved in all the patients with treatment, which included clotrimazole topical and tolfutate topical in 27 patients each, fluconazole in 25, acetic acid alone in 14, and topical plus fluconazole in 10. The thinking is that the use of broad-spectrum quinolone drops may be promoting the emergence of fungi by eliminating the colonizers in the external ear canal thereby allowing the fungus to grow. This doesn’t imply we should stop using quinolone-containing otic solutions, but I do think we need to be aware of the regurgitation of fungal culture mid-ear middle in a child who still has otorrhea after 5-7 days of treatment. Of course, we all know that prevention is the best medicine.

A group from Turkey recently published a comparison of 1 mL intraoperative isotonic saline irrigation, postoperative antibiotic treatment (sulfamycin/amphotericin 25 mg/kg for 5 days), postoperative ototopical drops (twice a day for 5 days), or placebo in 280 children (mean age 5.9 years) undergoing bilateral ventilatory tube insertion because of severe otitis media during 2000-2004 (Am. J. Otolaryngol. 2005;26:123-7).

At 2 weeks post surgery, purulent otorrhea was observed in 15.7% of the saline group, 14.2% of those who received prophylactic oral antibiotics, and 8.6% of the topical antibiotic group, all significantly lower than the 30% rate among the control group. They appear that saline irrigation of the middle ear prior to tube placement offers a low-cost intervention for reducing early post-tympanostomy tube otorrhea.

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