

Ototoxic effects from gentamicin ear drops

Reason for posting: Gentamicin ear drops can cause serious side effects (e.g., vertigo, imbalance, ataxia, oscillating vision, hearing loss and tinnitus) when used by patients with perforated tympanic membranes or tympanostomy tubes.¹ Despite previous warnings²⁻⁴ ototoxic adverse events continue to occur. The incidence of such events is unknown, but 20 cases have been reported in Canada since 1981,⁵ with 17 involving vestibular disorders and 3 involving hearing loss. In most cases the conditions being treated were middle-ear disorders with otorrhea; in 1 case gentamicin ear drops were being given to treat Ménière's disease (along with high-dose intratympanic gentamicin infusions). Six patients had used the drops for no more than 5-7 days. The dam-

age was often persistent: in 16 patients the symptoms had not resolved at the time the case was reported to Health Canada.⁵

The drug: Several preparations of topical gentamicin sulfate solution are marketed in Canada to treat superficial ear and eye infections. Indications for otic preparations include otitis externa⁶ ("swimmer's ear"). Preparations that include a steroid (e.g., betamethasone) are indicated for acute otitis externa, eczematoid dermatitis, seborrheic dermatitis and contact dermatitis with secondary infection⁶ and are often prescribed for off-label use to treat chronic suppurative otitis media.⁷ Prolonged use of these combination topical agents can result in a secondary fungal infection and mycelial plug,⁷ and use of any gentamicin ear drops can lead to the development of aminoglycoside-resistant organisms.⁸

Although the risk of ototoxic effects from aminoglycoside otic preparations has long been recognized,⁹ its importance may have previously been underappreciated. In a survey of 2235 otolaryngologists in the early 1990s, 84% reported using ototopical agents in the presence of a perforated tympanic membrane, and only 3.4% reported having witnessed irreversible ear damage caused by such agents.¹⁰

What to do: Acute and uncomplicated otitis externa is often prevented with a few drops of vinegar in each ear after swimming and can be treated with an antiseptic solution such as aluminum acetate.⁷ When gentamicin ear drops are indicated otoscopic examination is essential, because aminoglycoside ear drops are contraindicated in patients with a perforated tympanic membrane (including those with tympanostomy tubes). The treatment duration should be as short as possible, often less than 7 days, and the drug should be stopped immediately if ototoxic symptoms develop. Patients should be assessed for adverse ef-

fects after the first 5-7 days of use, and regularly thereafter if treatment is prolonged. Audiometric assessment is not an appropriate screening tool for ototoxicity,¹¹ because ototoxic effects of topical gentamicin solutions appear to be primarily vestibular rather than cochlear.^{3,4} Although ototoxicity in patients with intact tympanic membranes has not yet been reported, patients taking the drug for chronic otitis media often systemically absorb detectable levels of the drug.¹¹ Thus, it may be appropriate to warn all patients taking gentamicin ear drops of possible ototoxic effects. When a topical agent is required in patients with a perforated tympanic membrane, non-ototoxic ear drops such as ciprofloxacin solution may be preferable.

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