Ototoxicity related hearing loss

Hearing loss, balance disturbance and tinnitus may occur as a result of taking both prescription and over the counter medications, or direct/indirect exposure to toxic chemicals in an industrial setting. There are a number of compounds currently in clinical use with known ototoxic properties, including aminoglycoside antibiotics, salicylates, anti-neoplastic platinum-based chemotherapy agents, anti-malarial drugs, heavy metals, and loop diuretics. Hearing loss is usually symmetrical, however unilateral and asymmetrical cases have been reported\(^1\). Usually a hearing problem will only be caused by exceeding the recommended dosage of medications.

**ANTINEOPLASTIC AGENTS**
*(Cisplatin and Carboplatin)*
Hearing loss can be permanent, usually high frequencies first, and correlates with the amount received, but the risk can be significant especially in BEP Regimen for testicular cancer.

**AMINOGLYCOSIDES\(^2\)**
*(Neomycin, Tobramycin, Kanamycin, Gentamicin and Amikacin)*
Usually with prolonged use (5-6 months), affecting high frequencies first causing permanent damage.
SAliCylAteS (Aspirin)
When administered in high doses, elderly patients are more at risk. Hearing loss occurs across the frequency range, but is usually reversible as thought to be due to biochemical/metabolic changes in the cochlea. Tinnitus is also common. Hearing can return within 48-72 hours of cessation of medication as the salicylate is metabolised.

LOOP DIURETICS (Fursemide, Bumetanide, Ethacrynic acid)
Hearing loss is usually temporary and correlates with the amount received.
When the loop diuretic is discontinued, the hearing may be restored.

ANTIMALARIALS (Quinine, chloroquine)
The onset of tinnitus has been reported to precede measurable changes in hearing. Hearing loss can occur up to six months after exposure to cochleotoxic medication, so post treatment evaluation is required to confirm hearing has stabilised. It may not be until well after the completion of treatment that the impact of ototoxicity is fully identified.

RECOMMENDATIONS
Monitoring hearing during treatment allows the identification of early changes in hearing which could facilitate a change in treatment protocol to minimize further hearing loss, encourage timely counselling, and prompt the provision of assistive listening devices and/or hearing aids.

Referral to an audiologist is usually necessary in this context for two reasons:
1. Documentation – some patients may not have a measureable hearing loss.
2. The severity of hearing loss may have a prognostic value, as patients with worse hearing loss tend to recover less hearing.

Medical oversight of The University of Melbourne Audiology clinic is provided by an Ear Nose and Throat surgeon, allowing for immediate access to medical opinion regarding results and the management of ototoxic exposure cases.

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