Monitoring of Tobramycin Levels by Fingerprick Sampling

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Introduction: Tobramycin, an aminoglycoside antibiotic, is widely used against Gram negative bacterial infections and is particularly useful for the treatment of P. aeruginosa in patients with cystic fibrosis. It has a narrow therapeutic range and monitoring of the drug is required to reduce serious side effects such as nephrotoxicity and ototoxicity. Dosage alterations based on the results of drug monitoring have been found to improve efficacy and minimise toxicity. Monitoring currently requires venesection, but patients may find fingerprick samples less painful and more acceptable.

Methods: Venous and finger prick blood samples were collected from 45 patients attending the Manchester Adult Cystic Fibrosis Centre who were receiving intravenous tobramycin therapy. Tobramycin concentrations were measured on a Cobas Integra analyser using fluorescence polarization (Roche Diagnostics, Lewes, UK) according to the manufacturers instructions. The assay requires 3 μL sample at all frequencies (2kHz: r=0.609, p<0.001; 4kHz: r=0.572, p<0.001; 8kHz: r=0.549, p<0.001). No relationship with nebulised TOBI® was identified. 1 patient tested positive for the m.1555A>G mutation.

Conclusion: Tobramycin results from fingerprick sampling are interchangeable with those from venous sampling. Many patients receiving a course of intravenous tobramycin may prefer fingerprick sampling as a more acceptable means of obtaining specimens for analysis.

Otototoxicity in Adults with Cystic Fibrosis

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Background: Aminoglycosides are highly active against Pseudomonas aeruginosa but are known to be nephro- and ototoxic. With increasing CF life expectancy, the frequency of aminoglycoside exposure is increasing with possible increased risk of ototoxic side effects. There is no recent data describing the prevalence of ototoxicity in CF populations.

Aims: 1. To examine whether ototoxicity is a clinical problem in patients attending a large regional adult CF centre. To examine the association of ototoxicity with intravenous aminoglycosides, nebulised TOBI®, and the m.1555A>G mutation, (a mitochondrial mutation implicated in the development of aminoglycoside induced ototoxicity).

Methods: We conducted a retrospective audit of audiograms performed in MACFC patients over eleven years. All were reviewed by a consultant ENT surgeon. Results were compared to normal subjects from the National Study of Hearing and correlated against intravenous aminoglycoside and TOBI exposure. Results of the m.1555A>G screening test were collected.

Results: 51 patient audiograms were identified and examined. 17 (33.3%) were clinically abnormal and analysis demonstrated that CF patient audiometry was significantly worse than that of normal subjects. There was a statistically significant positive relationship between intravenous aminoglycoside exposure and hearing loss at all frequencies (2kHz: r = 0.609, p < 0.001; 4kHz: r = 0.572, p < 0.001; 8kHz: r = 0.549, p < 0.001). No relationship with nebulised TOBI® was identified. 1 patient tested positive for the m.1555A>G mutation.

Discussion: Hearing loss is a significant problem for patients attending the MACFC. Intravenous aminoglycoside exposure is strongly implicated. A large prospective study is required.