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Dose Dependent Changes In The Crista Neuroepitheium Resulting From Gentamicin Ototoxicity In The Chinchilla

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Abstract: This experiment was conducted to investigate the dose-dependent effects of gentamicin (GM) on the neuroepithelial morphology of the posterior crista ampullares (PCA) of the adult chinchilla. The experiment focused on hair cell (HC) morphology to monitor GM's dose-dependent effects and also to define an ototoxically-efficient and safe dose what would subsequently be used in a time course study. Chinchillas (n=13) were treated with subcutaneous (SC) daily doses of 120 mg/kg, 60 mg/kg, and 30 mg/kg GM, respectively, for six days. Light microscopy observations were made from the excised PCA of two animals from each group that survived the complete treatment regimen plus one day post-treatment (PT); these were compared to an untreated control group (n=4). Nephrotoxicity of GM was established by blood urea nitrogen (BUN) and creatinine measurements. The 120 and 60 mg/kg doses yielded a higher deterioration of kidney function with elevated levels of BUN and creatinine; pathological morphology within the kidneys was also observed. These findings were incompatible with the survival of the animals. In addition, results from one day post-treatment at each of the three different doses revealed non-specific morphological changes such as fusion of the hairs of the cells, shrunken cytoplasm and blebs. These results led us to choose the lower, safer, yet ototoxically-efficient dose of 30 mg/kg to study the time course of the GM-induced effects in a second experiment.

Key Words: Hair cells, gentamicin ototoxicity, nephrotoxicity, crista ampullaris, chinchilla

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