ABSTRACT

OBJECTIVE: To evaluate the safety of intratympanic (IT) administration of acyclovir in gerbils. The authors hypothesize that acyclovir can be delivered without damaging the cochlea. Acyclovir was chosen as a potential treatment for sudden sensorineural hearing loss.

STUDY DESIGN: Prospective animal study.

METHODS: Auditory brainstem response (ABR) was used to determine baseline auditory function in each of the gerbils. Acyclovir requires an alkaline pH to remain in solution. For this reason, acyclovir (7 mg/ml) was dissolved in Ringer’s Lactate (RL) buffered to a pH of 11. One ear of each gerbil underwent IT administration of the 150 µl acyclovir solution. The contralateral ear was injected with 150 µl RL buffered to pH of 11 to serve as control. Auditory function using ABR was reassessed four weeks after injection.

RESULTS: For both the acyclovir and the control, the post treatment ABR thresholds were elevated relative to baseline. ABR thresholds between 2 to 20 kHz were elevated an average of 20 – 40 dB. There was no auditory response above 20 kHz for both the acyclovir and the control. The ABR remained unchanged relative to baseline for IT administration of RL alone when the pH was buffered between 4 and 7.4.

CONCLUSION: IT administration of alkaline pH solutions causes auditory damage in the gerbil. Acyclovir requires an alkaline pH to remain in solution. For this reason, IT acyclovir cannot be used in the gerbil ear.