

1997, 718, Session X, Podium**The effect of kanamycin on hearing and the inner ear of Belgian Waterslager canaries (*Serinus canaria*)**

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It has been known for some time that Belgian Waterslager canaries suffer from a hearing loss primarily for frequencies above 2 kHz. This sensorineural hearing loss is associated with severe hair-cell pathology including fewer hair cells, deformed hair cells, and a narrower papilla. BWS canaries also show an increase in cell proliferation rate in their papillae compared with other birds including normal canaries and this rate of proliferation can be further increased by acoustic overexposure. The present experiments were undertaken to determine whether kanamycin would induce hair cell loss and threshold shifts in BWS, whether the ears recovered, and whether BWS canaries with newly populated papillae show recovery of hearing. In these experiments, BWS and normal canaries were trained by operant conditioning methods using food reward to detect pure tones at 1, 2, 2.86, and 4 kHz. Thresholds were measured prior to, during, and following an 8-day course of 200 mg/kg/day kanamycin. Kanamycin caused no threshold shift at 1 and 2 kHz but a 10-15 dB threshold shift at 2.86 and 4 kHz in BWS canaries. Threshold shifts were compared to those of normal canaries and behavioral recovery was followed for 12 weeks.

SEM analysis of hair cell loss in small birds, including budgerigars, zebra finches, chicks, and starlings, after kanamycin injection generally shows complete loss of hair cells in the basal half of the papilla. Interestingly, SEM analysis of canary papillae in the present study showed a less localized, more diffuse hair cell damage and loss throughout the papilla.

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