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Brainstem evoked potentials in budgerigars

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Although there are numerous behavioral studies of hearing in budgerigars, there are no studies of hearing in these birds younger than 6 months of age. Here, brainstem evoked potentials were recorded in adult and nestling budgerigars. Subjects were presented with both rectangular-pulse clicks and tone burst stimuli. Clicks were 0.1 ms in duration and presented in ascending order from 30-100 dB peakSPL. Tone bursts were 5 ms in duration with a 1 ms rise/fall, presented at frequencies ranging from 500 - 8000 Hz at intensities of 30-100 dB SPL. Thresholds were computed from latency-intensity and amplitude-intensity functions for all frequencies. Thresholds for click stimuli are 50-55 dB peakSPL in adult birds, with the waveform typically having 2-3 identifiable peaks. Thresholds for 10-12 day post hatch nestlings are above 90 dB peakSPL but improve markedly over the next 5 days approaching adult levels by day 31. The waveform of the ABR also changes dramatically over the first 16 days of age with it becoming similar to that of an adult by the end of the nestling period. ABR threshold audiograms for adult budgerigars are similar in shape to behavioral audiograms, but the ABR audiogram is elevated by 20 dB. Like songbirds, budgerigars use auditory feedback to learn and modify their calls throughout life. Thus, knowing how the auditory system develops and what and when the animal hears provides insights into the role that hearing plays in the development of different types of vocalizations.

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