Auditory function in rhesus monkeys: effects of aging and caloric restriction in the Wisconsin monkeys five years later.

Caloric restriction (CR) slows aging in many species and protects some animals from age-related hearing loss (ARHL), but the effect on humans is not yet known. Because rhesus monkeys are long-lived primates that are phylogenetically closer to humans than other research animals are, they provide a better model for studying the effects of CR in aging and ARHL. Subjects were from the pool of 55 rhesus monkeys aged 15-28 years who had been in the Wisconsin study on CR and aging for 8-13.5 years. Distortion product otoacoustic emissions (DPOAE) with f2 frequencies from 2211 to 8837 Hz and auditory brainstem response (ABR) thresholds from clicks and 8, 16, and 32 kHz tone bursts were obtained. DPOAE levels declined linearly at approximately 1 dB/year, but that rate doubled for the highest frequencies in the oldest monkeys. There were no interactions for diet condition or sex. ABR thresholds to clicks and tone bursts showed increases with aging. Borderline significance was shown for diet in the thresholds at 8 kHz stimuli, with monkeys on caloric restriction having lower thresholds. Because the rhesus monkeys have a maximum longevity of 40 years, the full benefits of CR may not yet be realized.