Clinical Tidbits ...for Physicians

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Hearing Conclusively Shown to Impact Postural Stability

A very recent study showed that postural stability and balance is better with spatial hearing cues, illuminating another piece of the balance and falls-risk puzzle.

Years of research and study into human equilibrium has established firmly that maintaining postural stability is a multi-sensory process which integrates and depends on vestibular, visual, and somatosensory inputs. Hearing also provides spatial localization, through analyzing differences in the time, intensity, and frequency differences of sounds arriving at each ear. These differences are processed in the central auditory system, and spatial localization is achieved. Audiologists have often thought, and previous research has shown, that hearing loss is a risk factor for falls, although no direct evidence of a causal relationship existed. This study shows a direct and causal relationship, which gives new insight into the sense of hearing's contribution to postural stability.

Essentially, participants in this study (n=19) where taken through several balance tests in different conditions: eyes open and eyes closed *without* spatial sound cues, and eyes closed *with* spatial sound cues. Results showed that in the balance tests with eyes closed *with* spatial cues (Tandem Romberg and Stepping Fukuda), subjects swayed less, and maintained less angular deviation from "straight ahead". Reduction in sway was 9% on the Tandem Romberg, a small but significant affect on balance. The reduction in angular deviation from straight ahead in the Stepping Fukuda was 76%; quite significant.

Zhong X, Yost WA. Relationship between Postural Stability and Spatial Hearing. *J Am Acad Audiol.* 2013 Oct;24(9):782-8.

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