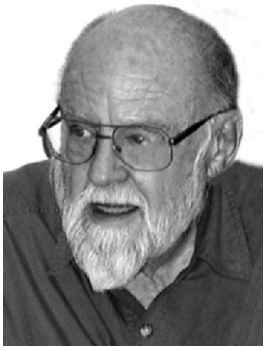
Editorial

Otoacoustic Emissions: The New Gold Standard?



From the very beginnings of modern hearing measurement, the gold standard for hearing loss has been the pure-tone audiogram. It is an essential element of otologic and audiologic evaluation and provides the data upon which virtually all impairment, disability, and compensation schemes are based. But an article in this issue of *JAAA*, "Risk Factors for Distortion-Product Otoacoustic Emissions in Young Men with Normal Hearing," by Peter Torre III and Laura Dreisbach (San Diego State University), Richard Kopke (Oklahoma University Health Science Center), and Ron Jackson and Ben Balough (the Naval Medical Center of San Diego), prompts the question, "Is there a more sensitive index of auditory status than the pure-tone audiogram?" The authors examined pure-tone audiograms, middle-ear measures, and distortion-product otoacoustic emissions (DPOAEs) in 436 United States Marine recruits at the Marine Corp Recruit Depot in San Diego. All had pure-tone audiometric levels within normal limits and normal middle ear function, but DPOAEs varied systematically, albeit slightly, according to ethnicity (not-Hispanic vs. Hispanic) and three risk factors, noise exposure, tinnitus, and smoking. To take just one example, the mean DPOAE amplitude difference between Hispanics and not-Hispanics at 8 kHz was a significant 1.2 dB, but the mean difference in audiometric thresholds between the two groups was a nonsignificant 0.2 dB. This is impressive sensitivity in a group of young adults (average age = 19.2 years) with normal audiograms.

What if the gold standard for hearing loss were DPOAE amplitudes rather than audiometric thresholds? Three major advantages come immediately to mind. First, you would have an exceedingly sensitive measure, one that reflects small changes in outer hair cell function before they become evident on a 5 dB step measure; second, you would never have to worry about masking the nontest ear; third, you would not need the active participation of the person being tested. With these latter two pesky problems out of the way, you could delegate the whole operation to an audiometric technician and spare the valuable time of the audiological doctor.

There are, of course, two major hurdles still to be overcome: (1) the problem of quantifying a possible air-bone gap, and (2) the problem of measuring degree of loss in the 50–100 dB range where DPOAEs are not likely to be too helpful. The discussion of these problems I will have to reserve for a later editorial.

James Jerger
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