Reviewer's report

Title: Tone burst-evoked otoacoustic emissions in neonates: normative data

Version: 1 Date: 14 January 2008

Reviewer: Douglas Keefe

Reviewer's report:

This report studies the properties of 1 kHz tone-burst OAEs in neonatal ears. This topic is timely because of the clinical importance of newborn hearing screening programs and limitations in existing transient-evoked OAE tests. The report will be of interest to OAE researchers.

- Major Compulsory Revisions None.

- Minor Essential Revisions

B1. The use of the term "stimulus intensity level" for peak-equivalent sound pressure level is incorrect. Sound intensity is a vector quantity that concerns the acoustic energy flow per unit area through a given surface.

B2. Specific whether the target stimulus level was measured in each ear, or in some standard coupler or artificial ear.

B3. More discussion of why the 1 kHz tone burst mainly elicited a response near 1.5 kHz would be useful. This behavior was not observed in the Konrad-Martin and Keefe studies referenced below. If this outcome was due to spectral splatter from the two-cycle acoustic stimulus, windowing the electrical input stimulus might have been helpful. If this was due to increased noise at 1 compared to 1.5 kHz, and thus a reduced SNR at 1 kHz, it would be helpful to point that out. Given this result, would it not be preferable to measure the TBOAE using a 1.5 kHz tone burst rather than a 1 kHz tone burst? The conjecture that some influence across TBOAE channels may have contributed to the frequency separation between response and stimulus energy is not well supported; this could be tested by high-level coupler measurements that product some distortion. It is not clear what intermodulation mechanism might produce this result.

B4. A major conclusion is that combined 1 kHz TBOAE plus CEOAE measures may improve the pass rate in neonatal hearing screening programs. This conclusion must be tempered by reporting the total measurement time for each of these measures, and the extent to which the resulting pass rate would be superior to that using a CEOAE test alone with a long measurement time (equal to the total measurement time of the combination test).

B5. The "QuickScreen" mode should be described as a manufacturer's term, and the critical property explaining its poor performance at 1 kHz is the fact...
that the window duration is too short in QuickScreen mode compared to the OAE latency at 1 kHz. This has been discussed by Hussain et al., Ear Hear. 19, 434-449, 1998.

- Discretionary Revisions

C1. Other studies on transient measurement of OAEs, which are analogous to TBOAEs, in older child and adult ears are Konrad-Martin and Keefe (JASA 114, 2021-2043, 2003; JASA 117, 3799-3815, 2005).

C2. Last two sentences of Procedures seem mixed up. If CEOAE and TBOAE test order was randomized, it doesn’t seem correct as well that ears passing CEOAE test were included in a subsequent TBOAE test.

C3. On page 7, State the definitions of stimulus stability and reproducibility or provide reference.

C4. On page 8, it would be helpful to specify more description of the mother wavelet function that was proposed by Tognola. Was the Matlab 7.0 software standard Matlab or the Matlab Wavelet Toolkit? If the former, was the code developed in-house or provided by another researcher?

What next?: Accept after minor essential revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I hold patents relating to the subject of measuring otoacoustic emissions.