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EMISSIONS

PIYAWADEE SONTHISOMBAT : CLICK EVOKED OTOACOUSTIC  
EMISSIONS AND DISTORTION PRODUCT IN NORMAL HEARING AND  
HEARING IMPAIRED ADULTS. THESIS ADVISORS: CHANCHAI  
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Click evoked otoacoustic emissions (CEOAEs) and distortion product otoacoustic emissions (DPOAEs) can help assess the functional condition of the cochlea and differentiate between normal and impaired hearing. Both CEOAEs and DPOAEs have been found to be related to hearing threshold levels. The purpose of this study was to investigate the relationship between CEOAEs and DPOAEs with a comparison to pure tone audiogram in the same group of normal hearing and hearing impaired adult subjects, and compare CEOAEs and DPOAEs amplitudes between normal hearing and hearing impaired adult subjects.

The hearing threshold, tympanogram, CEOAEs and DPOAEs were measured in 60 ears (7m/25f) with normal hearing and a mean age of 26.73 years, and in 60 ears (20m/16f) with hearing impaired and a mean age of 30.55 years. The results indicated that the CEOAEs response level, CEOAEs and DPOAEs spectrum amplitudes in normal hearing was significantly higher than those in the hearing impaired. The CEOAEs and DPOAEs spectrum amplitudes at 1, 2 and 4 kHz showed positive correlation with each other in groups of normal hearing and in group of hearing impaired (4-6 kHz notch, high frequency sloping and low frequency sloping) at  $p < 0.05$ . The PTT at 1-4 kHz, CEOAEs amplitudes at 1, 2 and 4 kHz and DPOAEs amplitudes at 1, 2, 4 and 6 kHz showed significant negative correlation in groups of normal hearing and in group of hearing impaired (4-6 kHz notch, high frequency sloping) at  $p < 0.05$ . No correlation was found between pure tone threshold at 1-4 kHz, CEOAEs amplitudes at 1, 2 and 4 kHz and DPOAEs amplitudes at 1, 2, 4 and 6 kHz in low frequency sloping and flat audiogram.

The results of this study confirmed the correlation between CEOAEs and DPOAEs in the same ear and confirmed the correlation between PTT, CEOAEs and DPOAEs. This finding suggested that CEOAEs and DPOAEs be present in normal ear having PTT better than 20 dBHL. The CEOAEs were absent when PTT was greater than 35 dBHL, and 50 dBHL for DPOAEs. Thus, the CEOAEs should be more sensitive in detecting early stages of hearing loss. However, DPOAEs showed more robustness than the CEOAEs at a high frequency component.

The differences between the occurrence of the two emissions suggest that CEOAEs may be preferable for hearing screening purposes, whereas DPOAEs may be more valuable for monitoring cochlear changes clinically. Therefore, both CEOAEs and DPOAEs have the potential of becoming important parts of the basic evaluation of hearing.