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KESARA KHEMAWUT: EFFECT OF AGE MATURATION ON
DISTORTION PRODUCT OTOACOUSTIC EMISSIONS IN NORMAL HEARING
SCHOOL CHILDREN AGED 4 TO 10 YEARS OLD. THESIS ADVISORS:
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The 2f1-f2 distortion product otoacoustic emissions (DPOAEs) amplitude were studied in varied age groups: neonate, infant, children, young adult, and adult. The decreasing of 2f1-f2 DPOAEs amplitude with increasing age could be due to the maturation of outer ear and middle ear, reaching maturation approximately at age 7. The purpose of this research was to assess the effect of age maturation and gender on 2f1-f2 DPOAEs amplitude: DP-gram, DP-I/O function, and I/O function slope, from 60 ears of 60 normal hearing school female and male children aged 4-7 years (y) and 7-10 y. Each group consisted of 15 subjects. The 2f1-f2 DPOAEs amplitudes were obtained by using ILO 292 DP Echoport version 5. DP-gram were obtained at primary frequencies (f2)= 696-6348 Hz with primary level L1: L2= 60:50 dBSPL. DP-I/O function were generated at f2= 1001-6006 Hz with L1=L2= 40-70 dBSPL. The f2/f1 ratio was fixed at 1.22 in both measurements. I/O function slopes were calculated by curve fitting method.

Effects of age maturation on 2f1-f2 DPOAEs amplitudes SNR I/O function showed a statistical significance between both younger and older groups. The younger subjects group had a lower 2f1-f2 DPOAEs amplitude SNR I/O function at f2= 1001 Hz, L1= 40, 60, and 70 dBSPL (p<0.05) and at f2= 2002 Hz, L1= 60 dBSPL (p<0.05) and L1= 70 dBSPL (p<0.01). However, they showed lower DP-I/O functions, which might have been due to the higher noise floor at the same frequencies of those DP-I/O functions (p<0.001) in the younger group. No statistical significance regarding the effect of age maturation on 2f1-f2 DP-gram and I/O function slope was found.

The effect of gender in older subjects group on 2f1-f2 DPOAEs amplitude exhibited significantly higher 2f1-f2 DPOAEs in female than in male. There were significant differences in those of DP-gram at f2= 3174 Hz (p<0.001) and at f2= 4004 Hz (p<0.05). There were significant differences in those of DP-I/O function at f2= 6006 Hz, L1= 60 and 70 dBSPL (p<0.05), respectively. There were significant differences in those of I/O function slope at f2= 2002 Hz, L1= 40-50 dBSPL (p<0.05) and at f2= 3003 Hz, L1= 50-60 dBSPL (p<0.05). The effect of gender in younger subjects group on 2f1-f2 DPOAEs amplitude showed no statistical significance between female and male in all three tests (p>0.05).

The results of this study can be used as a guideline in assessing the 2f1-f2 DPOAEs amplitude without the effect of age maturation in children aged 4 to 10 years. However, a further study on the effect of spontaneous otoacoustic emissions (SOAEs) on 2f1-f2 DPOAEs amplitude between gender and longitudinal study to monitor effect of age maturation in the same group of subjects is recommended.