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**HEARING SCREENING OF INFANTS USING EVOKED
OTOACOUSTIC EMISSIONS: THE EFFECT OF
EXTERNAL AND MIDDLE EAR CONDITIONS**

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ABSTRACT

The aim of the study was to determine if Transient Evoked Otoacoustic Emissions (TEOAEs) can be used as a method of Screening for hearing impairment and to study the effects of External and Middle ear conditions on the outcome of TEOAEs.

TEOAE and Tympanometry tests were performed on 193 infants (386 ears). External and Middle ear abnormalities were evaluated by ear examinations and Tympanometry, and assigned to two groups based on the tympanogram results. Group A had normal external and middle ear with 'Type A' Tympanograms and group B with external and / middle ear abnormalities and abnormal tympanograms other than 'Type A'.

Infants who failed the TEOAE screening in group A had follow up with Auditory Brainstem Response test (ABR), while group B failures were seen by the Ear specialist. Post examination pass rate were evaluated by TEOAE and Tympanometry.

The findings of this study are as follows: 255 (66 %) passed the initial TEOAE screening test while 131 (34 %) failed. Ears with no external or middle ear abnormalities (group A) had a significantly higher TEOAE screening pass rate (72.6%) than those in (group B) as detected by Tympanometry (31.2%). TEOAE failure rate in group A indicated a higher percentage of infants having Sensorineural hearing impairment than in group B. Post examination and treatment of external and /middle ear conditions improved the TEOAE pass rate.

ABSTRAK

Tujuan kajian dijalankan adalah untuk menentukan jika "Transient Evoked Otoacoustic Emissions" sesuai digunakan sebagai kaedah saringan (screening) untuk menentukan kekurangan pendengaran serta mengkaji kesan masalah bahagian telinga luar dan tengah terhadap keputusan "TEOAE".

Ujian "TEOAE" dan "Tymanometry" telah dijalankan keatas 193 kanak – kanak (386 telinga). Untuk menentukan sebarang kecacatan pada bahagian telinga luar dan tengah, ujian telinga serta "Tymanometry" dilaksanakan dan hasilnya 193 kanak-kanak tersebut dibahagikan kepada dua kumpulan iaitu berdasarkan keputusan yang diperolehi. Kumpulan 'A' mempunyai mempunyai bahagian telinga luar dan tengah yang biasa (normal) dengan "Tymanometry" jenis 'A' dan kumpulan 'B' pula mempunyai telinga luar dan tengah yang bermasalah serta "Tymanogram" luar biasa (abnormal).

Kanak-kanak kumpulan 'A' yang gagal ujian saringan "TEOAE" terpaksa menyusuli dengan ujian "Auditory Brainstem Response test"(ABR), manakala kanak-kanak kumpulan 'B' yang gagal "TEOAE" telah dirujuk kepada Pakar Telinga. Ini diikuti dengan pemeriksaan dan rawatan susulan TEOAE dan "Tymanometry".

Keputusan kajian ini mendapati 255 telinga telah lulus ujian saringan awal manakala 131 gagal. Telinga-telinga kanak-kanak dari kumpulan 'A' mempunyai tahap kelulusan(72.6%) yang lebih tinggi secara signifikan berbanding telinga dari kumpulan B (31.2%).Kadar kegagalan dalam ujian "TEOAE" bagi kanak-kanak kumpulan 'A' telah menunjukkan peratus yang lebih tinggi mempunyai kekurangan pendengaran "Sensorineural" berbanding kumpulan 'B'. Pemeriksaan dan rawatan susulan telah meningkatkan kadar kelulusan "TEOAE"

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GLOSSARY OF ABBREVIATIONS

Hz	:	Hertz
DBSPL	:	Decibel sound pressure level
ABR	:	Auditory Brain stem response
EOAEs	:	Evoked Otoacoustic emissions
OAEs	:	Otoacoustic emissions
SOAEs	:	Spontaneous otoacoustic emissions
TEQAEs	:	Transient otoacoustic emissions
NICU	:	Neonatal intensive care unit
TYMP	:	Tympanogram
OHC	:	Outer hair cell
Msecs	:	Milliseconds
Fig.	:	Figure