

## SHORT COMMUNICATION

## Otoacoustic emissions and their use in diagnosing hearing impairment in children

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Otoacoustic emissions (OAE) are low-level sounds primarily generated by the outer hair cells in the cochlea and are recorded in the external ear. The most useful clinically evoked otoacoustic emissions are the transiently evoked otoacoustic emissions (TEOAE) and distortion product otoacoustic emissions (DPOAE). They are used to diagnose hearing impairment in children, to monitor hearing after using ototoxic drugs, after strong infections, head injuries and to differentiate between cochlear and supracochlear hearing impairment. Both these methods are fast, non-invasive and objective and therefore we use them also for newborn hearing screening. Early identification of hearing impairment leads to early start of treatment and rehabilitation, which should start until 6–8 month of age.

### Methods

Our study consisted of a retrospective analysis of the data from all children born in Kramare Hospital in the year 2005. In total, 2037 newborns underwent initial screening test 2–4 days after birth, directly in maternity hospital. ECHO-SCREEN was used, a screening instrument using the basics of TEOAE. Newborns who failed the initial test were invited to follow-up after 1 month. The failure in initial test does not necessarily mean a hearing impairment, because also middle ear pathology has a negative effect on the presence of OAEs. Newborns who failed also the 2nd and 3rd testing were invited to further tests, BERA (Brainstem Evoked Responses Audiometry), ASSR (Audiometric Steady State Responses).

### Results

From the group of 2037 newborns 1542 (75.7 %) passed and 495 (24.3 %) failed the initial test. From 495 newborns who failed, 134 did not keep next appointment. Another 312 passed the 2nd or 3rd test and 49 failed also 3rd or 4th test. Until March 2006 four children with hearing impairment were diagnosed at our department.

### Conclusions

OAE is fast, objective, simple and non-expensive method available in Slovakia, therefore the universal newborn screening should help to early identify hearing impairment in children. Although the age of diagnose and start of treatment is currently 7 months to 1 year, the hearing screening enormously increased the number of early diagnosed children.\*

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### References

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