

Abstract EFAS/DGA 2007

The role of OAEs in monitoring NIHL in individuals

Helleman, H.W., Helleman, H.W., Jansen, N., Simis, Y.J.W., Dreschler, W.A.

AMC Amsterdam, The Netherlands

Otoacoustic emissions (OAEs) have been suggested as useful in monitoring noise-induced hearing loss (NIHL) because OAEs were more sensitive to so-called pre-clinical hearing loss, have better test-retest variability than the audiogram, or could be a predictor for future hearing loss.

Many of these expectations are based on cross-sectional studies, few have followed individuals over time. There is no evidence-based consensus on how to use OAEs in an individual hearing conservation programme. Our study serves as a starting point for longitudinal testing and is designed to determine the scope in which OAEs can be used to follow individuals over time.

Approximately 200 employees of a newspaper printing-office in the Netherlands were measured twice, with 13 months of noise exposure in between. The measurements consisted of both audiogram and OAEs. For 50 subjects the short-term test-retest variation has been determined and used to derive a measure for significant changes in both methods based on the standard error of measurement

Critical issues are the influence of background noise, duration of the test procedure, choice of stimulus parameters and a relatively large standard error of measurement. In some persons with (audiometrically) normal hearing OAEs turned out to be absent, while some persons with moderate hearing losses showed extraordinary strong emissions. Although low emissions might be indicative for future hearing loss, it should be noted that for these particular individuals it is impossible to further monitor their hearing with OAEs.

We believe that further longitudinal testing should confirm or reject whether OAEs can serve as predictors for hearing loss. In setting up such an experiment we have encountered issues that may hamper the application of otoacoustic emissions. We think that the use of OAEs for the monitoring of NIHL in individuals is only allowed under severe restrictions that can be derived from longitudinal studies.

