

# Badania emisji otoakustycznych u dzieci podczas chemioterapii z powodu ostrej białaczki limfoblastycznej

Otoacoustic emissions measurements in children during the chemotherapy because of the acute lymphoblastic leukemia

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## Summary

**Introduction:** Chemotherapy is associated with an increased risk of ototoxic changes. The predictive value of conventional pure-tone audiometry on early detection of ototoxicity has been questioned. Otoacoustic emissions (OAEs) appear to be more sensitive to cochlear insult than the conventional pure-audiometry. The purpose of our study was (a) investigation the clinical usefulness of Distortion Product Otoacoustic Emissions (DPOAEs) as early indicator of chemotherapy-induced ototoxicity, (b) determination which of the protocols of chemotherapy is most ototoxic as measured by DPOAEs, (c) comparison of the short-term and long-term effects of chemotherapy on DPOAEs. **Material and methods:** Tonal audiometry (0,25-8 kHz), immittance audiometry and DPOAEs were measured in 10 children with acute lymphoblastic leukemia (ALL). Measurements were performed before and after each protocol of ALL IC-BFM 2002 chemotherapy: protocol I: vincristine (VCR), L-asparaginase (L-ASP), daunorubicin (DNR), cyclophosphamide (CPM), cytarabine (ARA-C), 6-mercaptopurine (6-MP), methotrexate (MTX); protocol mM: 6-MP, MTX; protocol II: VCR, doxorubicin (DOX), L-ASP, CMP, ARA-C, thioguanine (6-TG), MTX; protocol III: VCR, DOX, L-ASP, CMP, ARA-C, 6-TG, MTX. DPOAEs were measured using ILO2 92 Otodynamics Analyser. Cochlear activity was evaluated by recording 2f1-f2 DPOAEs with L1 = 65 and L2 = 60 dB SPL. Comparisons of the DP-grams amplitudes were performed between baseline measurements and those recorded before and after each chemotherapy course. **Results:** Our results indicate that: a) DPOAE is a more sensitive technique for the assess of chemotherapy-induced ototoxicity than conventional audiometry, b) with DPOAE monitoring very subtle hearing changes can be detected, c) DPOAE amplitude was significantly decreased at all frequencies studied in 50% children with leukemia, d) depression of DPOAE amplitude was evident only during and after first protocol, e) long-term DPOAE monitoring revealed reversibility of ototoxicity in all children, f) a large individual variability in the DPOAE response following the chemotherapy was observed, g) in a few cases a transient increase in DPOAE amplitude had been observed before it was reduced. **Conclusions:** Distortion product otoacoustic emissions measurements are very sensitive on early detection of the changes in cochlear function and are recommended for monitor hearing in patients during chemotherapy.

