

Auditory late effects due to therapy-related ototoxicity in survivors of childhood brain tumors

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Background/ aims

Childhood brain tumor survivors are at risk to develop long-term sequelae such as hearing loss due to therapy-related ototoxicity. In the treatment of childhood brain tumors, platinum chemotherapy and/or radiation therapy are commonly used. The aim of the study was to determine the auditory late effects in adult childhood brain tumor survivors.

Method

225 survivors treated between 1971 and 2011 at Ghent University Hospital (Belgium) and at least 5 years off therapy, were invited to take part in the study. Hearing status was evaluated by admittance measures, tonal audiometry with extended high frequencies, speech audiometry in quiet and noise, distortion product otoacoustic emissions (DPOAEs), and auditory brainstem response (ABR). A questionnaire was administered to subjectively evaluate hearing and quality of life. Four treatment groups were defined: the surgery only group, the group with adjuvant radiotherapy, the chemotherapy group (platinum derivatives) and the group with adjuvant chemo- and radiotherapy. So far, the presence and severity of hearing loss was assessed and compared between the four treatment groups.

Results

Fifty-seven subjects (56.1% females) with a mean age of 26.36 years (SD 8.67) and between 5 and 41 years off therapy, underwent the audiological assessment. Hearing loss was found in 34 subjects (59,6%) and was typically sensorineural, progressive and starting at the high frequencies. Hearing loss was mostly found in the treatment group that received a combination of chemo- and radiotherapy (71,4%). To define the severity of hearing loss, the Common Toxicity Criteria and International Society of Pediatric Oncology ototoxicity grading scales were used. The majority of subjects with severe hearing loss were found in the treatment group that received a combination of chemo- and radiotherapy. Remarkably, subjects that only received surgery also had hearing loss. A more in depth analysis of DPOAEs and ABR will be presented at the conference.

Conclusions

Hearing loss due to therapy-related ototoxicity is prevalent in childhood brain tumor survivors. In the group that received a combination of chemo- and radiotherapy, the prevalence and severity of hearing loss was the highest. Long-term audiological follow-up is necessary for an adequate detection of hearing loss and early rehabilitation.

Highlights

- Therapy-related ototoxicity in childhood brain tumor survivors can occur on long-term.
- To evaluate auditory effects due to ototoxicity, an extensive audiological assessment is needed.
- Hearing loss is more prevalent and severe in subjects receiving chemo- and radiotherapy as compared to the subjects in the other treatment groups.

Key words

- Childhood brain tumors
- Ototoxicity
- Audiological assessment

Oral presentation