

## BRAIN MRI IN CHILDREN WITH SENSORY NEURONAL HEARING LOSS

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**Introduction:** Hearing loss in the first years of life leads to speech, language and cognitive delays. Computed tomography (CT) and magnetic resonance imaging (MRI) examinations of the peripheral hearing system is mandatory. However, little is known about the imaging of the entire brain and central auditory tract, which is important in planning effective postoperative speech and hearing rehabilitation. Here we present preliminary data from our 4-year multidisciplinary and multicentric teamwork on preoperative MRI assessment of children recruited for cochlear implantation.

**Material and methods:** CT and 3Tesla MRI from 95 children with severe inner ear hearing loss (IV grade) were analysed retrospectively. 70 patients underwent full neurological, neuropsychological and electrophysiological (EEG) examination.

**Results:** Neuroimaging data from 9 children (9.47%) showed abnormalities of the inner ear such as otomastoiditis, mastoid cyst, cystic inclusions in the pyramid, deformed cochlea and vestibula, hypoplasia of the auditory nerves. Brain MRI was normal in 5 cases and in 4 cases it was accompanied by hydrocephalus, periventricular leucomalacia and cortical atrophy. Such brain abnormalities, including these 4 cases, were found in 50 candidates for cochlear implantation. The MRI of these patients showed different brain structures pathologies: leucomalacia, hydrocephaly or combination of these two and different degrees of cortical atrophy. In 26 cases the subcortical white matter changes were bilaterally concentrated in the temporo-parieto-occipital region.

**Conclusion:** Our preliminary data show that the multidisciplinary assessment of cochlear implantation requires whole-brain MRI imaging in combination with EEG and neuropsychological examination in order to plan optimal speech recovery.

