**The role of Magnetic Resonance Imaging in the diagnosis of endolymphatic hydrops and Menière’s disease**

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**Purpose**

A dedicated 3T magnetic resonance imaging (MRI) protocol of the inner ear was introduced to evaluate the presence and extent of endolymphatic hydrops (EH). In this pilot study, we assessed retrospectively the sensitivity and specificity of this MRI protocol in patients diagnosed with definite Menière's disease (MD).

**Material and methods**

The study was performed on a 3-Tesla MRI machine using a three-dimensional-fluid-attenuated inversion recovery (3D-FLAIR) sequence performed 4 hours after an intravenous (iv) injection of a double dose of gadolinium. EH in the cochlea and/or vestibule was classified as either none, grade I, or grade II (cfr. reported criteria in recent literature). For this study, the MRI was considered as positive in cases of hydrops present in the cochlea or the vestibule. Thirty-five patients diagnosed with definite MD were included (31 unilateral and 4 bilateral MD patients). For ethical reasons (potential long-term side effects of gadolinium administration), no control group (healthy volunteers) could be included. Therefore, contralateral healthy ears of the included unilateral patient population were used as normal control ears.

**Results**

The MRI was positive in 93% of definite unilateral MD suspected ears (29 out of 31 ears). In 25 ears, hydrops was visible both in the cochlea and the vestibule; in 3 ears we only found hydrops in the vestibule, and in 1 ear only the cochlea was positive for hydrops. All 4 patients with bilateral suspected MD had a positive MRI on both sides. The sensitivity, determined in the asymptomatic contralateral healthy ears of the 31 unilateral MD patients, was 84%.

**Conclusions**

This preliminary study confirms that 3T 3D-FLAIR MRI of the membranous labyrinth performed 4 hours after iv gadolinium administration can be a very helpful tool for diagnosing definite MD. Further studies in a larger patient population will be required to confirm these preliminary findings.