

Estudio número 2

Asociación entre hipoacusia en la edad adulta con la pérdida de volumen del lóbulo temporal en la senectud.

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Origen: Johns Hopkins University School of Medicine, Baltimore, Maryland.

Este estudio prospectivo de cohortes correlaciona la hipoacusia en la edad adulta (45-65 años) con la neurodegeneración de las estructuras del lóbulo temporal, un biomarcador de la enfermedad de Alzheimer precoz.

Evaluaron la audición mediante audiometrías tonales de 194 pacientes y se obtuvieron imágenes y mediciones del lóbulo temporal de los mismos. El tiempo medio de seguimiento fue de 19,3 años. Se excluyeron aquellos con deterioro cognitivo basal, accidente cerebrovascular, lesiones craneoencefálicas, enfermedad de Parkinson y trastorno bipolar.

Tras el análisis de los datos por un equipo multidisciplinar, se constató que la hipoacusia en la edad adulta, particularmente en el oído derecho, se asoció con una disminución volumétrica más marcada en la sustancia gris temporal derecha en la senectud.

Estos hallazgos sugieren que la hipoacusia en la edad media de la vida es un factor de riesgo para la pérdida de volumen del lóbulo temporal, por lo que la corrección precoz de las hipoacusias podría prevenir el deterioro cognitivo en las edades más avanzadas.

Association of midlife hearing impairment with late-life temporal lobe volume loss.

- **Importance:** Hearing impairment (HI) in midlife (45-65 years of age) may be associated with longitudinal neurodegeneration of temporal lobe structures, a biomarker of early Alzheimer disease.
- **Objective:** To evaluate the association of midlife HI with brain volume trajectories in later life (≥ 65 years of age).
- **Design, setting, and participants:** This prospective cohort study used data from the Baltimore Longitudinal Study of Aging to evaluate hearing from November 5, 1990, to October 3, 1994, and late-life volume change from July 10, 2008, to January 29, 2015, using magnetic resonance imaging (MRI) (mean follow-up time, 19.3 years). Data analysis was performed from September 22, 2017, to August 27, 2018. A total of 194 community-dwelling older adults who had midlife measures of peripheral hearing at a mean age of 54.5 years and late-life volume change of up to 6 years between the first and most recent MRI assessment were studied. Excluded were those with baseline cognitive impairment, stroke, head injuries, Parkinson disease, and bipolar disorder.
- **Exposures:** Hearing as measured with pure tone audiometry in each ear from November 5, 1990, to October 3, 1994, and late-life temporal lobe volume change measured by MRI.
- **Main outcomes and measures:** Linear mixed-effects models with random intercepts were used to examine the association of midlife hearing (pure tone average of 0.5-4 kHz tones in the better ear and each ear separately) with longitudinal late-life MRI-based measures of temporal lobe structures (hippocampus, entorhinal cortex, parahippocampal gyrus, and superior, middle, and inferior temporal gyri) in the left and right hemispheres, in addition to global and lobar regions, adjusting for baseline demographic characteristics (age, sex, subsequent cognitive impairment status, and educational level) and intracranial volume.
- **Results:** A total of 194 patients (mean [SD] age at hearing assessment, 54.5 [10.0] years; 106 [54.6%] female; 169 [87.1%] white) participated in the study. After Bonferroni correction, poorer midlife hearing in the better ear was associated with steeper late-life volumetric declines in the right temporal gray matter ($\beta = -0.113$; 95% CI, -0.182 to -0.044), right hippocampus ($\beta = -0.008$; 95% CI, -0.012 to -0.004), and left entorhinal cortex ($\beta = -0.009$; 95% CI, -0.015 to -0.003). Poorer midlife hearing in the right ear was associated with steeper late-life volumetric declines in the right temporal gray matter ($\beta = -0.136$; 95% CI, -0.197 to -0.075), right hippocampus ($\beta = -0.008$; 95% CI, -0.012 to -0.004), and left entorhinal cortex ($\beta = -0.009$; 95% CI, -0.015 to -0.003), whereas there were no associations between poorer midlife hearing in the left ear with late-life volume loss.
- **Conclusions and relevance:** The findings suggest that midlife HI is a risk factor for temporal lobe volume loss. Poorer midlife hearing, particularly in the right ear, was associated with declines in hippocampus and entorhinal cortex.
- N.M. Armstrong; Y. An; J. Doshi; G. Erus; L. Ferrucci; C. Davatzikos; S.M. Resnick. 2019.
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