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COGNITION

Exploring the link between hearing loss and cognitive decline in adults over 60: a pilot study

Kyla **Munoz Galarza**[1,2], Jean Pierre **Gagné**[1,2], Louis **Bherer**[1,2,4], Adriana **Lacerda**[1,2,3]

[1]Centre de recherche de l'Institut universitaire de gériatrie de Montréal (CRIUGM), [2] Université de Montréal, [3] Co-titulaire de la Chaire de la Fondation Caroline-Durand en audition et vieillissement, Université de Montréal, [4]Centre de médecine préventive et d'activité physique (Centre ÉPIC) de l'Institut de cardiologie de Montréa

Introduction

Age-related hearing loss, or presbycusis, is a prevalent condition characterized by a progressive decline in hearing sensitivity, especially at high frequencies, as individuals age. This sensory impairment can significantly impact communication and social interactions, creating challenges for older adults. At the same time, cognitive decline—marked by a gradual loss of cognitive functions such as learning, memory, and reasoning—becomes increasingly common with age. Studies have identified a potential link between hearing loss and an elevated risk of cognitive decline among older adults. Presbycusis has been suggested as a possible biomarker for cognitive impairment and dementia. The rising prevalence of both hearing loss and cognitive decline is of relevance. Globally, hearing loss is linked to 8% of dementia cases and is recognized as the most significant among 12 modifiable risk factors for dementia. The complex relationship between hearing loss and cognitive decline demands further investigation. Understanding this connection is crucial for developing effective strategies to address and potentially mitigate the impacts of these conditions in aging populations. This study seeks to explore these interactions more thoroughly, aiming to provide insights that could inform future approaches to managing age-related hearing loss and cognitive decline.

Objectives

1. **Investigate the prevalence of hearing loss in older adults:** Assess the prevalence of hearing loss among older adults participating in the longitudinal study "Action Cardio Risk" at the Montreal Heart Institute.
2. **Examine the relationship between hearing status and cognitive test results:** explore the relationship between hearing status and cognitive test results obtained at baseline, focusing on how hearing loss might correlate with neurocognitive performance as measured by baseline assessments.

Methods & Materials

Methods:

This retrospective cross-sectional analysis uses preliminary data from the "Action Cardio Risk" project at the Montreal Heart Institute. The project's goal is to explore the effects of aerobic, resistance, and cognitive training on neurocognitive functions in older adults with cardiovascular risk factors. For this analysis, we focused on baseline data to achieve two main objectives: determining the prevalence of hearing loss and examining its relationship with cognitive performance. Specifically, we compared baseline cognitive performance scores with baseline hearing status in 49 participants to identify potential correlations between auditory and cognitive functions.

Materials:

Cognitive Function

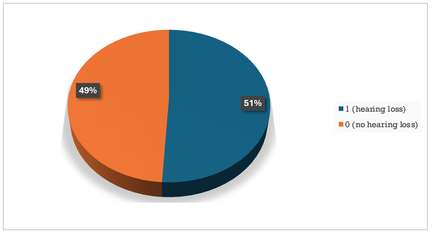
To assess cognitive function, participants underwent a comprehensive neurocognitive evaluation that included the Montreal Cognitive Assessment (MoCA) as well as other tests at baseline, 6 months, and 12 months. However, for the purposes of this analysis, only the baseline MoCA scores were utilized.

Hearing status

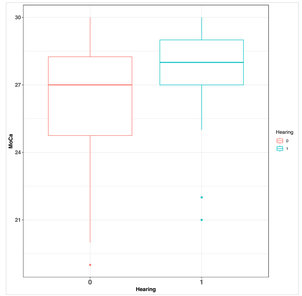
Hearing status was evaluated at baseline using a multi-faceted approach. This included a subjective assessment where participants reported their own hearing difficulties through a self-report questionnaire. Additionally, an objective hearing screening was performed using HearCheck. These combined methods provided a thorough evaluation of hearing status at baseline.

Results

According to the results, participants were categorized based on hearing status into those with hearing loss (1) and those without (0). The analysis revealed that 51% (25 out of 49) of participants exhibited hearing impairment.
For those without hearing loss, the mean MoCA score was 27, whereas participants with hearing loss had a mean MoCA score of 28. The comparison between cognitive performance and hearing status did not show a statistically significant correlation between MoCA test results and hearing status.



Distribution of hearing loss among participants



MoCA scores by hearing status

Discussion & Conclusion

Although previous studies suggest an association between hearing loss and cognitive decline, our findings did not show a statistically significant correlation between MoCA scores and hearing status at baseline. Specifically, while participants with hearing loss had a slightly higher mean MoCA score compared to those without hearing loss, but this difference was not significant. It is important to note that our study relied solely on MoCA scores and baseline hearing assessments. The MoCA is a broad cognitive screening tool, but it may not capture all dimensions of cognitive function that could be affected by hearing impairment. Comprehensive assessments that include multiple cognitive tests could provide a more nuanced understanding of the relationship between hearing loss and cognitive performance. Moving forward, we will analyze MoCA results at 6 and 12 months, along with other cognitive tests, and we will explore the hypothesis that cognitive reserve can mediate the relationship between hearing and cognition.

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