Introduction

A number of studies have found an association between poorer performance on cognitive assessments and hearing loss.1,2 Most of these investigations have found that individuals with elevated audiometric pure-tone thresholds are more likely to perform poorly on evaluations of cognitive function.2,3 A review performed by Naumann and colleagues supports the idea that neural peripheral auditory function, central auditory function, and cognitive function are interrelated; degradation in one of these functional areas may be related to decrements in one or more of the other functional areas.4 Aging has negative effects on peripheral auditory function, central auditory function and/or cognitive function, potentially producing negative consequences in other functional areas.5 This is evidenced in the reduction in speech recognition performance among older participants and participants with cognitive impairment.6

The Montreal Cognitive Assessment (MoCA) is a screening tool designed to detect high sensitivity and specificity to the detection of mild cognitive impairment.7 The MoCA has been widely used in the context of hearing loss and amplification.8 The purpose of the present study was to examine relationships between performance on a cognitive screening tool, the MoCA, and audiometric factors collected as part of a comprehensive audiologic assessment. Factors of interest for the present study are age, gender, pure tone average (PTA), audiometric thresholds at 3000, 6000, and 8000 Hz; word recognition score (WR), and QuickSIN score.

Methods

Participants
- Retrospective analysis of data collected from 115 normal hearing and hearing impaired individuals who expressed interest in participating in a hearing aid research study.
- Participants, 76 males and 39 females, ranged in age from 55 to 85 years. The mean age of male participants was 72.6 years. The mean age of female participants was 70.8 years.

Audiometric measurements included in the analysis were:'
- Pure-tone thresholds at 500, 1000, 2000, and 4000 Hz in air conduction
- Pure-tone air conduction thresholds at 500, 1000, 2000, and 4000 Hz
- Speech recognition thresholds at 50%, 70%, 75%, and 80%
- PTA (average of audiometric thresholds at 500, 1000, 2000, and 4000 Hz)
- Word recognition score
- QuickSIN score

Methods

Audiologic and cognitive factors assessed show mild relationships to MoCA score. Loading the measured variables.

Statistical Analysis

The statistical analysis included data for PTA, WR, and QuickSIN from only the right 1.4 correlation analysis was completed between all of the demographic factors (gender and age) and measured variables of interest (PTA, WR, QuickSIN, and MoCA). Simple linear regression models were fitted to examine the effect of the three measured variables (PTA, WR, and QuickSIN) as well as the demographic factors of MoCA scores. Additionally, a multiple regression model was fitted to include all three measured variables and the demographic factors to determine the aggregate effect of the three measured variables and demographic factors on MoCA score.

Results

A correlation analysis revealed significant correlations between MoCA scores and hearing loss.

Summary and Conclusions

- A review performed by Humes and colleagues supports the idea that peripheral auditory function, central auditory function, and cognitive function are interrelated; degradation in one of these functional areas may be related to decrements in one or more of the other functional areas.4 Aging has negative effects on peripheral auditory function, central auditory function, and cognitive function, potentially producing negative consequences in other functional areas.5 This is evidenced in the reduction in speech recognition performance among older participants and participants with cognitive impairment.6

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