Implementation of Cognitive and Hearing Handicap Measures Into Cochlear Implant Candidacy Evaluations

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Significance and Background:

A link between hearing loss and cognitive impairments has been established. A study by Lin et al. in 2011 revealed an increased hazard ratio for a dementia diagnosis for those with hearing impairment. The ratio was higher for those with the most severe degrees of hearing loss. Fortunately, research has shown that addressing hearing impairment and providing sensory input via traditional hearing aids has a positive association with cognitive status (Dillon et al., 2013). Individuals impacted by hearing loss of a severe degree who do not receive optimal benefit from hearing aids however are considered for cochlear implantation. As implant candidacy criteria expands and the size of the geriatric population grows, an increased number of older adults are anticipated to pursue implantation (McRacken et al., 2017). The relationship between cognition and cochlear implantation has yet to be widely studied, but initial results show promise. A recent study of seven older adult women demonstrated an improvement in areas of cognitive function following implantation, when cognitive test results obtained post operatively were compared with pre-operative findings (Cosetti et al., 2016). Additional evidence is needed to ascertain if an association between cognition and cochlear implant use exists, as it does for those who benefit from traditional hearing aids (Dillon et al., 2013).

A related area of clinical interest in need of further exploration is that of implant use and patient perception of hearing impairment. The Centers for Medicare and Medicaid Quality Strategy report now include measures of quality of life as a primary outcome measure (McRacken et al., 2017). At the present time however, a measure of patient perception is not mandated during the implantation process. Monitoring of patient perception is of particular importance for implant recipients as it is known that adults with hearing loss are more likely to experience social isolation and emotional distress than their normal hearing peers (Gopinpath et al.,2012). Collection of meaningful data is therefore needed to ascertain how to best utilize available tools to gain insight into quality of life in order to best comply with Medicare and Medicaid goals.

By evaluating patient perception of hearing handicap and cognitive function pre-implantation, and then re-assessing these domains at significant intervals post-implantation, quantitative data which reflects the potential impact of cochlear implantation on cognition and patient perception can be collected. By gathering data in a systematic way using validated scales, additional evidence can potentially be discovered to better inform clinicians as to the relationship between cochlear implantation, cognition, and patient perception of hearing impairment.

Aims:

The primary aims of this retrospective chart review are as follows:

- To measure change in patient perception of hearing handicap pre-operatively and post-operatively in patients who elect to pursue cochlear implantation, through scores obtained on screening questionnaires, specifically The Hearing Handicap Inventory for The Elderly (HHIE)
- To measure cognitive skills pre-operative and post-operatively in patients who elect to pursue cochlear implantation through scores obtained on screening questionnaires, specifically The Montreal Cognitive Assessment (MOCA)
- To quantify any measurable change in MOCA scores pre and post operatively
- To quantify any measurable change in HHIE scores pre and post operatively

Hypothesis:

As there is a positive association, per prior research, between treatment of hearing loss with hearing aids and cognition, this study hypothesizes that there is a positive association between cochlear implantation and cognition. The hypothesis of this study is that those who undergo implantation will not show further cognitive decline, per MOCA measures, post-operatively. The score on the MOCA will not decrease. Additionally, this study hypothesizes that those who undergo implantation will perceive less hearing handicap post-operatively, per the HHI. The HHI score will decrease.