

The Prevalence and Impact of Vision and Hearing Loss in the Elderly

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With a rapidly aging population, awareness of sensory impairments in the older adult population is crucial. Vision and hearing loss, in particular, have a prominent impact on quality of life. Understanding the prevalence and impact of these impairments is important to help patients preserve and maintain a good quality of life.

Millions of Americans are affected by sensory impairments, with vision and hearing loss being two with the highest prevalence. Vision and hearing loss are particularly prominent in the older adult population. While vision loss has a negative impact on a person's perception of the world, hearing loss diminishes a person's mode of communication and can lead to social isolation. In the words of Helen Keller, "after a lifetime in silence and darkness...to be deaf is a greater affliction than to be blind...Hearing is the soul of knowledge and information of a high order. To be cut off from hearing is to be isolated indeed" [1].

Hearing Loss Prevalence

The World Health Organization (WHO) estimates approximately 360 million or 5% of the world's population has at least a moderate hearing loss [2]. An estimated half of these hearing loss cases result from a lack of preventative measures, including but not limited to immunizations or noise exposure reduction. In the United States, an analysis of data from 2001 to 2010 estimated 60.7 million individuals aged 12 years or older have hearing loss in at least one ear. The prevalence of hearing loss in the US is even higher in the older adult population; 75% of individuals aged 70 years or older have hearing loss, defined by pure-tone thresholds as mild (>25 through 40 dB HL), moderate (>40 through 55 dB HL), moderately severe (>55 through 70 dB HL), severe (>70 through 90 dB HL), or profound (>90 dB HL) [3, 4]. Despite this high prevalence of hearing loss in the elderly population, less than 30% of those who could benefit from hearing aids (HA) have a history of HA use [5].

Hearing loss is classified by the degree of the impairment for the frequencies that contribute to speech understanding. As listed above, degrees of impairment include mild, moderate, moderately severe, severe, and profound. The degree of hearing loss and associated speech perception abilities

determine candidacy for HAs or cochlear implants (CIs). HAs work by amplifying the incoming sound to overcome hearing loss. However, for those individuals with greater hearing loss or more severely damaged sensory cells in their cochlea, HAs may simply be amplifying a distorted signal. The individuals may hear the sound, but they cannot make sense of it. Patients with moderate or poorer degrees of hearing loss may not experience an improvement in speech understanding with appropriately fit HAs, as defined by professional standards. This leaves the patient to report, "I can hear, but I cannot understand." In these cases, a CI may be a more appropriate treatment option.

Cochlear implantation is currently indicated in the US for individuals with moderate to profound sensorineural hearing loss in both ears who receive limited benefit from appropriately fit HAs. A CI is comprised of two parts, including an internal component and an external speech processor. The system bypasses a damaged auditory system to directly stimulate a functioning auditory nerve. Although extensive research has demonstrated the safety and effectiveness of this system, only 5%-7% of adults who qualify for cochlear implantation in the US receive a CI [6]. It is not known whether this low percentage is due to lack of awareness, limited access to appropriate care, or some other cause. In addition, this statistic merely applies to those who qualify under the current indications, which research has shown to be conservative. Substantial research has demonstrated that patients who exceed current candidacy criteria may benefit from cochlear implantation.

Additional treatment options are available for individuals who do not qualify for traditional HAs or a CI (eg, middle ear implants, osseointegrated HAs). However, despite the availability of options in the US and worldwide, there continue to be many patients who would benefit from hearing technologies who are not receiving treatment. Many researchers, physicians, and clinicians in the fields of audiology, speech

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pathology, and otology have worked to expand awareness to those in need of treatment. One way to reach those in need of treatment is for clinicians to highlight the effects of untreated hearing loss. A current focus in research within the older adult population specifically is the relationship between hearing loss and cognition, and whether appropriate treatment of hearing loss may delay the onset of cognitive decline. Lin et al. (2013) assessed this relationship in a group of older adults enrolled in the Health, Aging, and Body Composition (Health ABC) study [7]. Participants did not have a prevalent cognitive impairment upon completion of the Modified Mini-Mental State Examination at baseline, and all completed an audiometric assessment at 5-years post-enrollment. The 6-year follow-up data indicated that participants with hearing loss displayed a 30%-40% accelerated rate of cognitive decline as compared to those with normal hearing. Additionally, a subsequent analysis of the 9-year follow-up data found that the participants with moderate to severe hearing loss had a greater risk of incident dementia [8].

The following question in response to the association of hearing loss with cognitive decline and incident dementia remains: does the treatment of hearing loss affect the rate of cognitive decline? Participants in the Health ABC study were asked about HA use at the 5-year interval [7, 8]. Based on the responses, the researchers did not find that HA use was significantly associated with a lower rate of cognitive decline over 6 or 9 years. However, the complexities of hearing loss treatment that greatly affect outcomes were not explored in this study (eg, HA experience, utilization of best practices in the fitting and verification of the devices). Researchers continue to investigate HA use amongst older adults and whether or not it slows the rate of cognitive decline when the devices are appropriately fit and used consistently. The researchers in the Health ABC study hypothesize that this causal association of hearing loss with dementia and cognitive decline may stem from increased cognitive load and/or social isolation. Several ongoing investigations are examining hearing loss and cognitive load, and how appropriately fit HAs may slow the trajectory of cognitive decline. The predicted long-term impact of untreated hearing loss, and other untreated sensory impairments, could result in monumental costs to Medicare.

Vision Loss

Vision loss is another sensory impairment with a high prevalence in the elderly population. The WHO estimated in 2014 that 285 million people are estimated to have a visual impairment, with 39 million classified as blind and 246 million as low vision [9]. Low vision is defined as the grouping of moderate and severe visual impairments. Approximately 65% of these individuals are aged 50 years and older. Reportedly, the treatment of visual impairment over the past 20 years has improved significantly worldwide. Unlike the prevalence of hearing loss, the prevalence of visual impairment has decreased despite an increasingly larger

population of older adults globally. This is primarily due to a decline in vision loss caused by infectious diseases worldwide. However, in the US alone, the National Eye Institute (NEI) estimates that the number of individuals with vision impairment will nearly double from the year 2010 to 2030, with the majority of those affected aged 70 years or older [10]. Although data on the treatment of vision loss in the adult population is not as readily available as it is for hearing loss, a study in 2007 found that only half of the 61 million adults in the US at high risk for vision loss visited an eye care professional over a 12-month period [11]. Those at high risk included individuals aged 65 years and older, individuals with diabetes, and individuals with vision or eye-related problems. It is reasonable to assume that this statistic is partly a result of lack of awareness about or limited access to appropriate care. But this statistic on vision loss, and the estimated statistics for hearing loss care/treatment, may also be due to lack of insurance coverage.

Whitson and Lin (2014) described a “coverage paradox” among care/treatment options for sensory impairments in the older adult population [12]. Currently, Medicare will likely cover treatment for vision or hearing loss that requires surgical treatment. However, there continues to be a lack of reimbursement for noninvasive options, including HAs, visual lenses or, more simply, assistive devices (eg, video magnifiers, assistive listening devices). In contrast to covering the costs of the CI surgical procedure and device, reimbursement is likely unavailable for a \$100-200 personal amplifier. Similarly, reimbursement is readily available for a \$15,000 surgical implantation of a lens-containing device but unavailable for a \$2000 video magnifier. The emotional and financial burdens of one sensory impairment on an older adult’s life is troublesome; it is hard to imagine the burdens of two sensory impairments.

Dual Sensory Impairment

Although dual sensory impairments are more common with an ever-expanding older adult population, few studies have examined the statistics on concurrent vision and hearing loss. This is likely due to a large number of cases being underreported and undiagnosed. A report from the National Health and Nutritional Examination Surveys in 2013 analyzed data on adults aged 20 years and older [13]. Approximately 1.5 million Americans in this age group were found to have concurrent vision and hearing loss. Moreover, the majority of those affected were older adults, with 11.3% of those aged 80 years and older having dual sensory impairment. Despite this high prevalence of dual sensory impairment in the older adult population, there continues to be a lack of awareness and resources not only among those affected but also among professionals in these fields. Increased collaboration among the interdisciplinary fields is crucial to lessen the impact of undiagnosed or untreated dual sensory impairment.

Considerations for appropriate referrals and treatment of older adults with vision and hearing loss must be on the fore-

front of clinicians' minds to better serve this population. It is our duty as highly trained professionals to refer to the pertinent professional for suspected impairments. With an appropriate referral, continued collaboration amongst health care providers is still necessary to treat the patient as a whole, rather than each impairment individually. Considerations for treatment amongst older adults with dual sensory impairment may be as simple as using printed material with a large font size and high-contrast print or demonstrating use and care of treatment devices in well-lit areas under a magnifying lens. Ease of manipulation and tactile feedback options should also be considered for treatment devices and accessories. Additionally, recommendations may be made for a pair of eyeglasses that better accommodate an ear-level HA or CI processor. And though many more options can be considered for treatment in this population, rehabilitative strategies are essential to any treatment plan. Clinicians must focus on improving and maintaining function to best serve the older adult population.

Conclusion

By 2050, the older adult population in the US is projected to double as compared to its estimated size in 2012 [14]. With such a high prevalence of vision and hearing loss already in this population, it is crucial that researchers continue to shine light upon and resolve the issues regarding limited awareness and treatment. To be prepared for 2050, there should be higher prevention rates, acute diagnoses, and appropriate treatment, as well as readily available coverage for all of these. Otherwise, quality of life in the older adult population will be poor. To age successfully, quality of life must be maintained. To summarize the words of Helen Keller, "Blindness cuts us off from things, but deafness cuts us off from people" [1]. And the combination of the two conditions isolates a person not only from other people but also from the world itself. NCMJ

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