

SOUND information
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Healthy Hearing Can Prevent Brain Atrophy

The litany of hearing loss research making headlines over the past few years is staggering, and the findings have given healthcare providers reason to suggest to patients that they seek out better-hearing solutions. But the latest revelation by Johns Hopkins researchers may be the most compelling reason yet: Brain volume shrinkage is accelerated in older adults with hearing loss.

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Although the brain becomes smaller with age regardless of hearing ability, findings indicate that shrinkage occurs at a greater rate for those suffering from a hearing loss of at least 25 decibels (considered a “mild” hearing loss). Researchers found that brain tissue atrophy was greater by an additional cubic centimeter per year in those with compromised hearing. Much of this shrinkage occurred in regions of the brain that are associated with processing sound and speech, as an apparent consequence of starving the auditory cortex of stimulation. The study was performed over 10 years, and participants underwent yearly MRIs to track brain changes.

“Our results suggest that hearing loss could be another ‘hit’ on the brain in many ways,” says Dr. Frank Lin, a Johns Hopkins researcher and assistant professor at the University’s schools of medicine and public health.

The Johns Hopkins study is congruent with other research that indicates brain structures are smaller in people and animals with a measurable hearing loss — but it’s not completely clear whether these structural changes occurred as a result of hearing loss or were a reason for the hearing loss. Still, it is important to treat hearing loss before any potential structural changes take place and worsen overall health.

“If you want to address hearing loss well, you want to do it sooner rather than later,” says Dr. Lin. **“If hearing loss is potentially contributing to these differences we’re seeing on MRI, you want to treat it before these brain structural changes take place.”**

The findings represent yet another addition to the already troubling list of consequences associated with hearing loss, including dementia, increased instances of falling, and diminished overall physical and mental health. And it’s important to note that the same areas of the brain that suffered atrophy also play a role in memory and sensory integration, and are involved in early stages of mild cognitive impairment and Alzheimer’s disease.

Methods to reduce the risk of health problems through early hearing loss treatment will be developed over the next several years. Already studies have indicated that those who suffer from a hearing loss of only 25 decibels are three times more likely to have a history of falling. Each additional 10-decibel loss in hearing represents an increase in the chances of falling by 1.4-fold — and these findings held true when accounting for other factors linked with falling, such as age, sex, race, cardiovascular disease, and vestibular function. And perhaps most troubling: Excluding patients suffering from moderate to severe hearing loss did not change the results of the analysis. Patients who have trouble with their balance may be experiencing at least a mild hearing loss and may not be completely aware of it.

The injuries that result from these falls generate billions in healthcare costs. Though the falls cannot be attributed entirely to hearing loss, the statistics are too profound to ignore. Many people who suffer from balance issues also suffer from some form of hearing loss, for which one possible explanation is that those who can’t hear very well simply might not have a good awareness of their environment. Localization, a term that explains our auditory ability to determine where sounds come from, dissipates as hearing loss becomes more prominent. Although we don’t realize it, background noises often help our brain dictate where objects are based on how sounds are reflected off other objects. Missing out on those sounds affects our balance in ways that we might not have previously realized.

Another possible explanation for injuries is that the brain becomes overwhelmed with demands on its limited resources, which become further limited as brain shrinkage occurs. Regardless of the reason, research shows that men and women with hearing loss who are 70 and older are 32 percent more likely to have been admitted to a hospital in the previous four years than those with normal hearing. Prolonged injuries were worse too, as those elderly patients were also 36 percent more likely to have prolonged stretches of illness or injury (lasting more than 10 days), and a startling 57 percent were more likely to have deep episodes of stress, depression, or bad moods for long periods.

As new data is brought to light regarding hearing loss, the need for specialized, unique, individual care is further emphasized. Hearing loss does not affect any two people in the same manner, so a one-size-fits-all solution is not the answer. An experienced hearing health professional who emphasizes patient relationships and creates a hearing loss solution that suits individual needs will do wonders for your patients who are hard of hearing. Our practice would love to connect with yours and discuss a partnership that benefits both of us — and vastly improves the life of every patient we meet. ■

Lin, F. et al. Hearing Loss Linked to Accelerated Brain Tissue Loss. Johns Hopkins Medicine. January 2014.

Lin F. et al. Hearing Loss in Older Adults Tied to More Hospitalizations and Poorer Physical and Mental Health. Johns Hopkins Medicine. June 2013.

Lin, F. et al. Hearing Loss Linked to Three-Fold Risk of Falling. Johns Hopkins Medicine. February 2012.