Hearing loss in dogs associated with dementia

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A new study from North Carolina State University explores the connection between hearing loss and dementia in geriatric dogs. The work could aid in both treatment of aging dogs and in understanding the

relationship between sensory loss and cognitive function in dogs.

"In humans, we know that age-related hearing loss is estimated to affect one-third of people over age 65," says Natasha Olby, the Dr. Kady M. Gjessing and Rahna M. Davidson Distinguished Chair in Gerontology at North Carolina State University and corresponding author of the study.

"We also know that the rate of cognitive decline is approximately 30-40% faster in people with age-related hearing loss and that hearing loss is a greater contributor to dementia risk than other factors such as hypertension or obesity. But we don't understand whether the same holds true for dogs."

In the study, Olby and colleagues evaluated 39 senior or geriatric dogs. Auditory and cognitive tests were performed on each dog and their owners were asked to fill out two commonly used questionnaires—one focused on cognitive ability and the other on quality of life. Cognitive testing, questionnaire scores and age were compared between hearing groups.

The "average" dog can hear tones at 50 decibels (dBs) with no difficulty. Of the study cohort, 19 of the dogs could hear at 50 dBs, 12 at 70 dBs, and eight at 90 dBs (roughly equivalent to the noise made by a jet plane at takeoff). The average age of the dogs within each group were 12, 13 and 14 years old, respectively.

When the researchers compared the hearing results with owners' quality of life questionnaire responses, they found that scores related to vitality and companionship declined significantly as hearing deteriorated.

Similarly, cognitive questionnaire scores ranked all eight of the dogs in the 90 dB group as abnormal, compared to nine of the 12 in the 70 dB group and eight of the 19 in the 50 dB group. Results from cognitive

testing were similar: as hearing declined, so did the dog's ability to perform tasks.

"Hearing loss is one of the biggest predictors of dementia in people," Olby says. "Hearing loss also contributes to falls in elderly people, as sensory decline contributes to a loss in motor skills. So the connection between physical and neurological decline is clear for humans."

"This study indicates that the same connection is at work in aging dogs. But since we can potentially treat hearing loss in dogs, we may be able to alleviate some of these other issues. By quantifying neurological and physiological changes in elderly dogs, we're not only improving our ability to identify and treat these issues in our pets, we're also creating a model for improving our understanding of the same issues in humans."

The study appears in the *Journal of Veterinary Internal Medicine*.

More information: Gilad Fefer et al, Relationship between hearing, cognitive function, and quality of life in aging companion dogs, *Journal of Veterinary Internal Medicine* (2022). DOI: 10.1111/jvim.16510

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