

Over half of adults with chronic kidney disease have hearing loss; in 30%, the loss is severe

By Brande Victorian

A new study looking at the relationship between chronic kidney disease (CKD) and age-related hearing loss published in the *American Journal of Kidney Diseases* (2010;56:661-669), found that 54% of the adults in the study with moderate kidney disease had some degree of hearing loss, while 30% suffered a severe hearing loss.



“Previously, there have been studies showing that kidney function and hearing loss are linked because the kidney and the stria vascularis of the cochlea share a very similar physiological ultrastructure and have other angiogenic similarities,” said study co-author Bamini Gopinath, PhD, of the Centre for Vision Research at the University of Sydney, Westmead Hospital, speaking with *The Ear Hears*.

“There is also evidence of multiple shared risk factors between chronic kidney disease and hearing loss, such as age, diabetes, hypertension, and medications that are both nephrotoxic, meaning they cause damage to kidneys, and also ototoxic, causing damage to the ears,” she added.

BLUE MOUNTAINS HEARING STUDY

The Australian study included 2564 adults over age 50 who were apart of the Blue Mountains Hearing Study, a survey of age-related hearing loss conducted between 1997 and 2004. Baseline biochemistry tests were performed, along with pure-tone audiometry testing. Bilateral hearing loss was defined as an average pure-tone threshold greater than 25 dB for measurements at frequencies of 0.5, 1.0, 2.0, and 4.0 kHz. Moderate CKD was defined as having an estimated glomerular filtration rate (eGFR) less than 60 mL/min/1.73 m².

Reduced GFR function was associated with an increased prevalence of hearing loss. Specifically, 279 out of the 513 patients with moderate CKD had measured hearing loss, compared with 581 (28.3%) of the 2564 participants with an eGFR greater than 60 mL/min/1.73 m².

A weakness of the study, Dr. Gopinath noted, is that the researchers used glomerular filtration rate to assess kidney function rather than other gold standard methods. “Also the study is cross-sectional and not longitudinal so we can’t confirm a causal relationship. We don’t know which way it’s coming from, whether reduced renal function causes hearing loss or vice versa,” she added.

IMPORTANT MESSAGE

While the study may not confirm a cause-and-effect relationship between chronic kidney disease and hearing loss, it sends a clear message to primary-care physicians and nephrologists, said Robert Hopkin, MD, director of the Genetics Residency Programs at Cincinnati Children's Hospital Medical Center. That message is that it’s important for anyone with kidney disease to be given a formal hearing evaluation on a periodic basis.

“This study is a formal, quantifiable assessment of something that has been suspected before but has not been as well documented,” he said. “They actually looked at patients to see if the amount of kidney disease correlates with the risk for hearing loss. So, if you take a large

population of people with kidney disease, [the question is] what percentage of them will have hearing loss, not just is there an increase in hearing problems?”

Dr. Hopkin noted that audiologists probably don't need to be concerned about referring patients with hearing loss to be screened for kidney disease. “There is nothing in this study that points to the fact that if you have hearing loss you might have kidney disease. That would be a different kind of study.”

Some unanswered questions remain about what mechanisms are involved in the increased prevalence of hearing loss that was observed among the patients. For example, Dr. Hopkin asked, “Is it different membranes, is it the similar risk factors shared between kidney disease and hearing loss, it is ion blocks of potassium? They didn't define which mechanisms are most important, and that would be really good to know.”

Dr. Gopinath said that the research team plans to continue investigating this association in order to flesh out the current data. She added, “The Blue Mountain Study will be looking at this relationship in other populations, and we hope to look at the 10-year incidence of hearing loss and how that's associated with CKD.”