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## Women with Osteoporosis, Low Bone Density More Likely to Lose Hearing



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**Hearing loss is the third most common chronic health condition in the United States. Researchers found that risk of subsequent moderate or worse hearing loss was up to 40 percent higher in study participants with osteoporosis or LBD. Also, according to the Conservation of Hearing Study (CHEARS), bisphosphonates, commonly prescribed to reduce bone fracture risks, were not shown to alter likelihood of hearing loss. Findings were published May 24 in the Journal of the American Geriatric Society.**

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Researchers from Brigham and Women's Hospital analysed data from nearly 144,000 women who were followed for up to 34 years. They found that risk of subsequent moderate or worse hearing loss was up to 40 percent higher in study participants with osteoporosis or LBD and bisphosphonates did not seem to alter the risk of hearing loss.

"Adult onset hearing loss is typically irreversible; therefore, CHEARS focuses on identifying potentially modifiable risk factors that may contribute to hearing loss," said study leader Sharon Curhan, MD, ScM, of the Channing Division of Network Medicine at the Brigham. "We were inspired by a recent study that found that bisphosphonates may help prevent noise-induced hearing damage in mice. We wanted to investigate whether bisphosphonates alter risk of hearing loss in adults, in addition to whether there is a longitudinal association between osteoporosis or LBD and risk of subsequent hearing loss."

Data from the decades-long Nurses' Health Study (NHS) and NHS II, two large ongoing prospective studies of female registered nurses, were used for their analysis. The researchers focussed on moderate and severe hearing loss, as self-reported by participants on questionnaires completed every two years. They also used the CHEARS Audiometry Assessment Arm (a measure of hearing sensitivity based on the loudness of sound) to include data on participants' audiometric thresholds.

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In both the NHS and NHS II groups, the researchers found that the risk of hearing loss was higher in women with osteoporosis or LBD, and that taking bisphosphonates did not moderate the elevated risk. More research is required to understand whether the type, dose or timing of bisphosphonate use might influence its impact.

Respondents with a history of vertebral fracture had a 40 percent higher risk of hearing loss, but the same did not hold true for hip fractures, the two most common osteoporosis-related fractures.

The underlying mechanisms by which osteoporosis and LBD may contribute to aging-related hearing loss remain unclear, however, researchers suggest that abnormal bone remodeling and changes in the pathways involved in maintaining bone homeostasis may influence the integrity of the bone that protects the nerves and structures involved in hearing or alter ion and fluid metabolism in the cochlea, the main structure involved in hearing.

Investigators are interested in conducting additional studies that examine these associations in men and non-white women, as well as whether calcium and vitamin D intake are associated with hearing loss, as they have been shown to help prevent osteoporosis. In previous studies, the

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researchers found that eating a healthy diet, staying physically active, not smoking, and maintaining a healthy weight all help reduce the risk of hearing loss.

"Osteoporosis and low bone density may be important contributors to aging-related hearing loss," Curhan said. "Building lifelong healthy diet and lifestyle habits could provide important benefits for protecting bone and hearing health in the future."

Source: [Brigham and Women's Hospital](#)

Photo: iStock

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