

Many Elderly Falls Due to Inner-Ear Imbalance

By Kathleen Kingsbury | Tuesday, May 26, 2009

A simple fall is one of the most dangerous traumas the elderly face: one-quarter of older Americans who suffer a hip fracture after a fall die within six months of the injury. But what exactly causes so many people to fall, and thus how best to prevent such spills, has long evaded the establishment.

Now a new study conducted by Johns Hopkins researchers offers potentially lifesaving clues.

Looking at data from the

National Institutes for Health, researchers found that an estimated 35% of Americans over the age of 40 — roughly 69 million people — suffer from vestibular dysfunction, or as it is more commonly known, an inner-ear balance disorder. By age 60 and older, the data showed, inner-ear imbalances strike more than half of all Americans.

The study also found that vestibular dysfunction increased the risk of falling by a factor of 12. Although that link now seems obvious, doctors previously thought bone weakness, vision impairment and gait problems were the main culprits of falls among the elderly. And while physicians had always considered balance issues, they were concerned with those due to deteriorating vision or mental status, not the inner ear. "People with inner-ear balance problems regularly suffer dizziness or vertigo," says Dr. Yuri Agrawal, an otolaryngologist at Johns Hopkins

Hospital and the study's lead author, "so it makes a lot of sense that they are more apt to fall down."

Agrawal's study, published in the May 25 issue of the journal *Archives of Internal Medicine*, is among the first to highlight the prevalence of vestibular dysfunction. It also showed that patients who have the condition but are asymptomatic — that is, with no self-reports of dizziness — are still three times more likely to fall than healthy adults. The findings suggest that screening for such conditions during regular preventive care of patients over age 50 may lead to fewer falls and, ultimately, save lives. "Patients who are aware they're at a greater risk can take steps to minimize the chance of falling, such as physical therapy to improve balance or simply installing railings in places they tend to fall," Agrawal says.

Doctors still don't know what causes vestibular dysfunction or why it is so common. The vestibular system in the inner ear is made up of three semicircular canals and two otolith organs that continuously send messages to the brain about the head's rotation and motion as well as its orientation relative to gravity.



Catherine Paffey / Alamy

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Humans keep their balance using the vestibular system's signals, along with visual cues and touch sensations. When the inner-ear signaling process is disrupted, it directly affects a person's ability to maintain equilibrium.

Most likely, things start going awry simply due to advancing age, Agrawal says. Smoking, hypertension and diabetes are also associated with higher rates of inner-ear balance problems. Fortunately, the condition is easily diagnosable in the doctor's office: patients are asked to stand on a firm padded surface and close their eyes. Without the ability to use touch and vision to stay balanced, patients who suffer from an inner-ear problem promptly fall down. The addition of that simple test to annual physicals, Agrawal says, "would likely save millions of dollars and lives."

Indeed, according to the study, preventing tumbles could save the U.S. health-care system billions of dollars. More than 15,000 Americans die each year as a result of a fall, but far more — approximately 3 million — are injured. Falls not only cause physical injuries, such as hip fractures and organ damage, but also often lead to patients' loss of independence. And the costs to treat such outcomes add up quickly. Direct costs for medical care related to falls exceed \$20 billion annually, according to data published by the Centers for Disease Control and Prevention in 2006. **"By employing effective interventions, we can appreciably decrease the incidence of fall-related injuries, improve the health and quality of life of older adults, and significantly reduce health-care costs,"** that study's authors wrote.