

The following article originally was published on www.seniorjournal.com, a news and information web site for senior citizens

Aging News & Information

Inner Ear Balance Disorders Come with Age; Major Cause of Falls by Senior Citizens

Vestibular disorders are most common cause of dizziness in older people, responsible for 50% of dizziness in elderly.

May 26, 2009 – Vestibular disorders (inner ear balance disorders) are the most common cause of dizziness in senior citizens – a majority of the elderly over age 70 report dizziness and imbalance - and a majority of the accidental deaths from falls by older people are related to balance problems.

An estimated 35 percent of U.S. adults age 40 and older have vestibular dysfunction and it only gets worse with aging, according to a report in the May 25 issue of *Archives of Internal Medicine*, one of the *JAMA/Archives* journals.

One-third of people age 65 through 75 participating in a survey reported dizziness and imbalance degraded the quality of their lives, according to the Vestibular Disorders Association.

The vestibular system helps control an individual's balance, according to background information in the article. The two vestibular organs, within the temporal bone at the side and base of the skull, provide input to the brain about head motion and orientation relative to gravity.

"Vestibular dysfunction is typically characterized by vertigo (i.e., an illusory sense of motion) and imbalance owing to disturbances in gaze and postural stability," the authors write.

"In some cases, vestibular dysfunction can culminate catastrophically in a fall, which is associated with serious injury and restricted mobility and ranks among the leading causes of death among older individuals."

Despite these concerns, little has previously been known about the prevalence of vestibular dysfunction in the United States, in part because of the difficulty of diagnosis.

Yuri Agrawal, M.D., and colleagues at The Johns Hopkins University School of Medicine, Baltimore, analyzed data from a nationally representative sample of 5,086 adults who participated in the 2001-2004 National Health and Nutrition Examination Surveys.



Participants completed a balance questionnaire, which determined history of dizziness and falls, and underwent in-person balance testing that involved standing on different surfaces under varying conditions (for instance, with their eyes closed).

As determined by these tests, the overall prevalence of vestibular dysfunction in the U.S. population aged 40 and older from 2001 through 2004 was 35.4 percent.

"Odds of vestibular dysfunction increased significantly with age, were 40.3 percent lower in individuals with more than a high school education and were 70 percent higher among people with diabetes mellitus," the authors write.

Individuals with vestibular dysfunction were more likely to report having dizziness and a history of falls. The 26.8 percent of participants who had symptoms of vestibular dysfunction, including dizziness, had an eight-fold increase in the odds of falling.

Individuals who were asymptomatic also had significantly increased odds of falling.

In addition, participants with vestibular dysfunction had an increased risk of hearing loss, which likely reflects the similar anatomic locations of the vestibular and hearing organs as well as their common blood supply.

"These findings suggest the importance of diagnosing and treating vestibular deficits to reduce the burden of fall-related injuries and deaths," the authors write.

"Given the high prevalence of this impairment, notably among the elderly, and the extraordinary costs associated with falls (exceeding \$20 billion annually), screening for vestibular dysfunction in assisted living or nursing home facilities, for example, could be a life-saving and cost-effective practice. Screening may be particularly effective in groups at heightened risk of vestibular dysfunction, specifically non-whites, individuals with less than a high school education, people with diabetes and the hearing impaired."

Aging, Balance, and Dizziness

By Vestibular Disorders Association

Balance: One of the leading health concerns for people over 60 is falling. Balance in walking and standing is dependent on many factors. The elderly have a higher risk of contracting many different kinds of diseases that can interfere with balance, including cataracts, glaucoma, diabetic retinopathy, and macular degeneration, which all affect vision; peripheral neuropathy, which affects position sense in the feet and legs; and vestibular-system degeneration.

Balance is also dependent on good muscle strength and joint mobility. A sedentary lifestyle and arthritis or other diseases of bones and muscles can compromise strength and mobility. Yet even healthy people over 65 appear to have more trouble than younger people in

maintaining their balance on soft or uneven surfaces when visual cues are not available (e.g., in the dark).

Dizziness in the elderly can be a result of problems with the vestibular, central (brain-related), and vision systems, as well as from neuropathy, psychological causes, and unknown causes. Vestibular disorders, however, are thought to be the most common cause of dizziness in older people, responsible for approximately 50% of the reported dizziness in the elderly.

Until recently, relatively little was known about the consequences of aging for the vestibular system. Anatomical studies have shown that the number of nerve cells in the vestibular system grows smaller with age, beginning at about age 55. The loss becomes more severe as age progresses.

Of all vestibular disorders, benign paroxysmal positional vertigo (BPPV) is one of the most common. See the description of [BPPV](#) and treatment for it through vestibular rehabilitation therapy (balance-retraining exercises and maneuvers).

The ability to move about freely is an important factor in the quality of life of both younger and older people. A healthy vestibular system is vitally important to freedom of movement.

>> From VEDA publication R-3, [Balance and Aging](#).

[>> More at Vestibular Disorders Association](#)

Benign Paroxysmal Positioned Vertigo is Most Common Problem

Most experts regard Benign Paroxysmal Positional Vertigo (BPPV) as the most commonly diagnosed vestibular disorder. It accounts for at least 20 percent of diagnoses made by doctors specializing in dizziness and vestibular disorders. It is the most frequent cause of vertigo in the elderly. The number of people affected by this disorder each year has been estimated between 10 per 100,000 and 64 per 100,000 people, and some experts feel even more may be affected.

About Benign paroxysmal positional vertigo (BPPV)

Benign paroxysmal positional vertigo (BPPV) is a disorder that causes vertigo, dizziness, and other symptoms due to debris that has collected within a part of the inner ear. This debris, called *otoconia*, is made up of small crystals of calcium carbonate (sometimes referred to colloquially as “ear rocks”). With head movement, the displaced otoconia shift, sending false signals to the brain.

Symptoms of BPPV are almost always precipitated by a change in head position. Getting out of bed and rolling over in bed are two common "problem" motions. Some people feel dizzy and unsteady when they tip their heads back to look up. An intermittent pattern of these symptoms is usual.

About 20% of all dizziness is due to BPPV. The most common cause of BPPV in people under age 50 is head injury. About 50% of dizziness in older people is due to BPPV. In half of all cases, BPPV is idiopathic, which means that it occurs for no known reason. BPPV is also associated with [migraine](#).

[Diagnostic tests](#) for BPPV include tests that look for the characteristic nystagmus (jumping of the eyes), such as the Dix-Hallpike test and electronystagmography (ENG).

[Particle-repositioning maneuvers](#), including the Epley maneuver and the Semont-liberatory maneuver, are very effective in treating BPPV and can be performed in the doctor's office in about 15 minutes. The goal of these maneuvers is to move the detached otoconia out of one of the semicircular canals. Treatment may also include individualized [vestibular physical therapy](#) exercises designed to help “retrain the brain.” The Brandt-Daroff habituation exercises are sometimes recommended and can be done at home. Canal-plugging [surgery](#) may be another option.

From VEDA publication R-5, [Benign Paroxysmal Positional Vertigo](#) (BPPV). VEDA also publishes the book [BPPV—What You Need to Know](#) (publication B-8).

More from the Mayo Clinic

Causes

Inside your ear is a tiny organ called the vestibular labyrinth. It includes loop-shaped structures (semicircular canals) that contain fluid and fine, hair-like sensors that monitor the rotation of your head. Other structures (otolith organs) in your ear monitor movements of your head and your head's position. These otolith organs contain crystals that make you sensitive to movement. For a variety of reasons, these crystals can become dislodged. When they become dislodged, they can move into one of the semicircular canals — especially while you're lying down. This causes the semicircular canal to become sensitive to head position changes it would normally not respond to. As a result, you feel dizzy.

Benign paroxysmal positional vertigo occurs most often in people age 60 and older. It can also occur after a minor to severe blow to your head. Less common causes of BPPV include disorders that damage your inner ear or, rarely, damage that occurs during ear surgery or during prolonged positioning on your back (supine).

Doctors can sometimes determine the cause of BPPV. It may require a consultation with an ear, nose and throat (ENT) specialist or a doctor who specializes in the brain and nervous system (neurologist). However, it is almost as common that no specific cause for BPPV can be determined.

Risk factors

Aside from aging, there are no definite factors that may increase your risk of benign paroxysmal positional vertigo. However, a prior head injury or any other disorder of the balance organs of your ear may make you more susceptible to BPPV.

Related Stories

[Senior Citizens 'Inoculated' Against Falling in Successful Research Project](#)

Shows how brain develops fall prevention strategies that can be generalized to variety of conditions
Feb. 4, 2009



[Physical and Cognitive Declines Increase with Age Due to Slow Decay of Nerve Insulation](#)

Myelin breakdown is a process of aging underlying the erosion of physical skills and cognitive ability
Oct. 19, 2008

[Sen. Mikulski Wins Again in Fight Against Senior Falls: Senate Adopts Awareness Day](#)

National Falls Prevention Awareness Day was approved by Senate for September 22



Sept. 23, 2008

[Elderly Women Increase
Their Risk of Falling with
Less Than Five Hours
Sleep](#)

About one-
third of adults
older than age
65 experience
falls each
year



Sept. 8, 2008

[iShoe by MIT Student
May Save Thousands of
Senior Citizens from
Deadly Falls](#)

Future versions could
help correct problems by
providing sensory
stimulation to the feet
when the wearer is off-
kilter

August 1, 2008

[Senior Citizens Learning
to Fall Like a Skydiver
Can Reduce Hip
Fractures by 70 Percent](#)

Parachutist's landing
best reduces hip impact
whether you jumped from
an airplane or tripped on
a curb

July 7, 2008

[Nearly 8,000 Senior
Citizens Die from
Traumatic Brain Injuries
Following Falls](#)

TBIs maybe missed or

misdiagnosed among
older adults but 56,000
hospitalized in 2005

July 2, 2008

[Senior Citizens Having
Problems with Balance,
Walking Can Blame Their
Brain](#)

People with severe white
matter changes were
twice as likely to score
poorly on the walking and
balance tests

March 17, 2008

[Exercise Does Help
Senior Citizens Improve
Balance Says Data from
34 Studies](#)

Rising from a chair and
standing on one leg is
enough to help

Oct. 17, 2007

[Senior Citizens Improve
Mobility Better With
Balance Training than
Tai Chi](#)

Both reduce falls, more
improvement from
balance, stepping and
mobility

December 11, 2006

[Senior Citizens Gain
Health, Independence,
Balance with Exercise](#)

Goal of study is
prevention - keeping
people out of nursing
homes - Nov. 22, 2006

Read more [Aging
News & Information](#)