



Millions unaware of danger from vestibular dysfunction; diabetes a risk factor, along with age
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May 20, 2009- **A full third of American adults, 69 million men and women over age 40, are up to 12 times more likely to have a serious fall because they have some form of inner-ear dysfunction that throws them off balance and makes them dizzy**, according to Johns Hopkins experts.

Among the other key findings of the three-year survey and study on the subject by the Johns Hopkins team are that **a third of this group, or more than 22 million, were unaware of their vulnerability, having had no previous incidents of disequilibrium or sudden falls to suggest that anything was wrong.**

In the survey, to be published in the *Archives of Internal Medicine* online May 25, these asymptomatic people were six times more likely to suffer a potentially fatal fall than people with a healthy sense of balance, whereas people already experiencing symptoms of imbalance had a 12-fold increase in risk.

Accidental falls are among the leading causes of death in the elderly, killing an estimated 13,000 seniors each year in the United States and resulting in more than one and a half million visits to hospital emergency rooms, experts say.

“Vestibular imbalances need to be taken seriously because falls can be fatal and injuries can be painful, lead to long hospital stays and result in significant loss in quality of life,” says Lloyd B. Minor, M.D., the Andelot Professor and director of otolaryngology – head and neck surgery at the Johns Hopkins University School of Medicine. Minor says that recent government reports estimate that fatal falls in the elderly cost the U.S. Medicare program nearly \$1 billion in hospital charges, and those injured with broken bones cost an additional \$19 billion.

More than 5,000 men and women over age 40 participated in the survey, which took three years to complete and involved specialized exams and balance testing to find out who had vestibular dysfunction, its early signs and symptoms, and who did not.

And the chance of having a balance problem, survey results showed, increases with age and diabetes. Eighty-five percent of men and women over age 80 had an imbalance problem, 23 times more than people in their 40s. And people with diabetes were 70 percent more likely to suffer from vestibular problems. Researchers say this is likely due to damage done by high blood sugar levels to the hair cells in the inner ear that facilitate balance control and to the long-term damage from diabetes to the inner ear’s small blood vessels.

“Our survey shows that balance testing needs to be part of basic primary care, and that all physicians need to be monitoring and screening their patients for vestibular dysfunction so that we can take preventive measures to guard against falling,” says Minor.

Lead study investigator Yuri Agrawal, M.D., says one reason for the large numbers of undiagnosed and untreated individuals is that balance testing requires specialized training and the tests take more time and effort to perform than other diagnostic or screening procedures.

As part of the new survey, study participants were subjected to a half dozen key tests of unsteadiness, including physical exams.

Balance function was assessed by subjects' ability to stand upright with and without visual cues, such as being able to stand upright while wearing a blindfold or with their eyes closed, or by not having to use their arms to maintain balance while standing on a foam-padded mat.

“Now that we have identified the magnitude of balance problems, primary care physicians are more likely to be on the look out for its early signs and symptoms, and more attuned to when a patient needs to be referred to a physical therapist,” Agrawal says.

Minor points out that physical rehabilitation exercises can aid people with vestibular dysfunction. Balancing and walking exercises can be used to train the brain to compensate for inner-ear deficits and episodes of dizziness. One such exercise has unsteady people practice standing on one leg, while resting the other leg on a Styrofoam cup and trying not to crush it. Another exercise has people turning their head while walking.

Minor adds that people with vestibular dysfunction can take preventive steps to avoid falls in their homes, such as installing guard rails along stairs or hallways where a fall might occur, making sure rooms are well lit, and removing carpeting in places where people are more prone to trip.

Agrawal says the **team's next steps are to evaluate screening tools for identifying as early as possible** which people are at a heightened risk of falling. She also says other risk factors, such as sleep patterns and nutrient deficiencies, which may play a role in predicting risk of falling, need further study. Various rehabilitation techniques should also be examined to pinpoint which techniques work best at preventing falls and, ultimately, to allow people to live longer and healthier lives.

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In addition to Minor and Agrawal, other researchers involved in this research, conducted solely at Hopkins, were John Carey, M.D.; Charles Della Santina, M.D., Ph.D.; and Michael Schubert, Ph.D., P.T.