

# Vitamin D Deficit Key in Age-Related Morbidities

*Conditions such as dementia and overactive bladder may also be associated with low levels of the vitamin.*

BY JEFF EVANS  
Senior Writer

ARLINGTON, VA. — Inadequate levels of vitamin D may help to explain not only morbidities such as osteoporosis but also less-appreciated effects of vitamin D insufficiency that worsen bodily functions and are commonly thought to be related to aging alone, Dr. Neil Binkley said at a conference sponsored by the American Society for Bone and Mineral Research.

"I would like to suggest to you that vitamin D inadequacy might be contributing to what we are currently accepting as old age-related morbidity," said Dr. Binkley, who is the co-director of the University of Wisconsin Osteoporosis Clinical Center and Research Program, Madison.

The prevalence of densitometric osteopenia markedly increases with advancing age, and at any given bone density, age has a "profound impact" on the risk of fracture, he said (J. Clin. Invest. 1988;81:1804-9).

Many conditions other than osteoporosis that are affected by vitamin D status have been labeled as "age-related" morbidities, including the following:

► **Sarcopenia.** The expression of vitamin D receptors declines in muscle with aging. In muscle, vitamin D also may be involved with calcium transport and actin-myosin interaction.

A study of 1,008 older adults has sug-

gested that vitamin D inadequacy is associated with sarcopenia. After a 3-year follow-up, men and women with baseline 25(OH)D levels less than 25 nmol/L were more than twice as likely to develop sarcopenia (based on either grip strength or muscle mass) than were those with a higher level of 25(OH)D (J. Clin. Endocrinol. Metab. 2003;88:5766-72).

► **Falling.** It is not known whether vitamin D status and muscle strength are causally related, but "it is, however, clear that vitamin D status is related to the risk of falling in both older men and older women," Dr. Binkley said.

The risk of falling is increased by orthopedic disabilities, visual impairment, central or peripheral neurologic dysfunction, and muscle weakness, which may be the main risk factor, he said. A meta-analysis of double-blind, randomized, trials showed that vitamin D reduced the risk of falling by 22% (JAMA 2004;291:1999-2006).

► **Overactive bladder.** Bladder dysfunction also may be associated with muscle weakness, which can lead to poorer coordination of the muscles used to control urination. Overactive bladder affects 30%-40% of adults older than 75 years of age and two-thirds of nursing home residents; it is defined as urinary urgency with or without incontinence, usually with frequency and nocturia.

In a study of nearly 6,000 community-

dwelling women aged 40 years or older, women in the highest quintiles of vitamin D intake had the lowest risk of developing overactive bladder (Neurourol. Urodyn. 2004;23:204-10).

► **Difficulty swallowing.** Up to 40% of individuals older than 60 years have problems swallowing, which can lead to undernutrition, sarcopenia, and aspiration pneumonia.

Dysphagia associated with aging classically has been felt to reflect neurologic disease such as Parkinson's or stroke, but more recent work has shown that even normal healthy adults swallow more slowly and generate lower tongue pressures than do younger adults.

"I think it's at least plausible that this decreased muscle function might be causally related to the increased risk of dysphagia observed with advancing age," Dr. Binkley suggested.

But no research has been conducted on vitamin D status and the risk of dysphagia of aging, he said.

► **Pulmonary function.** Both the forced expiratory volume in the first second after a patient takes a deep breath and forced vital capacity are known to decline with aging; poor results on such tests are associated with substantial morbidity and mortality.

In a study of people in the National Health and Nutrition Examination Survey III (NHANES III) who were aged 60 years or older, both of those measures of lung function were significantly higher among people in the highest quintile of serum 25(OH)D concentration than it

was in individuals in the lowest quintile of the vitamin (Chest 2005;128:3792-8).

Biologically plausible ways in which vitamin D might protect against a decline in pulmonary function include the possibility of a decline in respiratory muscle function with inadequate levels of vitamin D, lung tissue remodeling, or a reduction in airway inflammation.

► **Age-related macular degeneration.** In a yet-to-be published study involving 7,752 people who participated in NHANES III, the risk of developing age-related macular degeneration declined steadily from the lowest to the highest quintiles of serum 25(OH)D concentration.

► **Dementia/cognitive decline.** In a small case-control study, investigators found deficient and extremely low levels of vitamin D in significantly more ambulatory women with Alzheimer's disease than in control women of the same age without Alzheimer's or fractures (Bone 1998;23:555-7).

A poster that was presented at the conference showed that higher scores on the Mini-Mental State Examination in 32 patients in a memory clinic were significantly and positively correlated with higher vitamin D concentrations. In the observational study, 25(OH)D levels below 30 ng/mL—the generally recommended cutoff for vitamin D sufficiency—were detected in 25 patients.

The active vitamin D compound 1,25(OH)D is known to increase levels of choline acetyltransferase, which is involved in the synthesis of the neurotransmitter acetylcholine. ■

## Benzodiazepines Not Tied to Fractures

BY BARBARA RUTLEDGE  
Contributing Writer

Reduced use of benzodiazepines in elderly patients does not necessarily result in a lower incidence of hip fracture, according to a study by Anita Wagner, Pharm.D., of the department of ambulatory care and prevention at Harvard Medical School, Boston, and her colleagues.

The researchers found no significant difference in the incidence of hip fracture over a 3-year period between elderly Medicaid recipients in New York, where benzodiazepine use decreased sharply during the study period, and in New Jersey, where benzodiazepine use remained constant.

"Benzodiazepines may not actually be associated with hip fractures, or at least not to the extent reported in some studies," Dr. Wagner and her colleagues wrote (Ann. Intern. Med. 2007;146:96-103).

The Prescription Drug Improvement and Modernization Act that went into effect in January 2006 further restricted benzodiazepine prescription coverage for Medicare recipients. Federal policy makers may have expected that reduced benzo-

diazepine access would decrease hip fracture risk and improve quality of life in the elderly.

Earlier data had suggested benzodiazepine use might raise the risk of hip fracture in elderly patients, with postural imbalance associated with benzodiazepine use, possibly leading to more falls and hip fractures in a population already at risk for hip fracture. But studies seeking to document a direct link have yielded conflicting results.

Since 1989, physicians in New York have been required to use serially numbered, triplicate forms for benzodiazepine prescriptions, with the third copy to be forwarded by the pharmacy to the state health authorities.

The study compared the risk of hip fractures in 1988 cohorts of 51,529 elderly Medicaid recipients in New York and 42,029 recipients in New Jersey, where the prescription policy was unchanged.

In New York, the change in prescription policy led to an abrupt decline in the drug's use, decreasing from about 40% of Medicaid enrollees each month in the 12-month period before the policy change to about 15% during the 21 months af-

ter the policy change. The drug's use in New Jersey Medicaid enrollees did not change significantly.

In New York, a total of 199 hip fractures occurred in female benzodiazepine recipients over the 33-month study period, with an increase in hazard rate from 53 per 100,000 enrollees before the policy change to 72 per 100,000 enrollees after the policy change.

In New Jersey, 135 hip fractures occurred in female benzodiazepine recipients in the study period, with a similar increase in hazard rate from 42 per 100,000 enrollees to 58 per 100,000 enrollees.

A total of 30 hip fractures in male benzodiazepine recipients in New York occurred over the study period, with the hazard rate increasing from 38 per 100,000 enrollees before the policy change to 54 per 100,000 enrollees after the policy change.

New Jersey results were similar, with a total of 27 hip fractures among male benzodiazepine recipients and an increase in hazard rate from 48 per 100,000 enrollees before the policy change in New York to 52 per 100,000 enrollees. In each case, hazard rates among benzodiazepine nonrecipients were similar. ■

## Posttrauma Mortality Rates Triple Among Octogenarians

NEW ORLEANS — Mortality rates after trauma are three times higher in octogenarians than in septuagenarians, according to an analysis of a trauma registry from a South Carolina hospital presented at the annual meeting of the American Association for the Surgery of Trauma.

Most of the literature suggests that mortality increases with age, but data on trauma outcomes for older patients are limited, said Dr. Robert Palmer of the Greenville (S.C.) Hospital System.

Dr. Palmer and his colleagues aimed to quantify morbidity, mortality, and disposition of cases in patients aged 70-79 and 80-90 years. They reviewed the hospital's trauma registry for the period 2002-2005 and identified 277 patients aged 70-79 and 230 patients over age 80. The group in their 70s represented 7% of all trauma cases, and the over-80 group represented 6% of the cases. Falls accounted

for just over half of the trauma in the 70-year-olds and for 80% in the 80-year-olds.

There was no statistically significant difference in the Glasgow Coma Score or Revised Trauma Score (RTS) between the two groups.

There were 16 deaths in the 70s group and 40 in the over-80 group. Head injury was the main cause of death. There was no correlation between the number or types of comorbidities in the two groups and mortality. When mortality was broken down by age and RTS, there were no differences between the groups except for those who had an RTS of 11. Only 11% of the 70- to 79-year-olds died with an RTS of 11, compared with 68% of those over age 80. The fact that some patients had a Do Not Resuscitate order may have changed mortality rates, which were 31% and 42%, respectively, in the 70-79 and over-80 groups with DNR orders.

—Alicia Ault