

# The Prevalence of Vitamin D Deficiency and Insufficiency in a Hematology-Oncology Clinic

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Discussions regarding vitamin D deficiency in patients at the Lynchburg Hematology-Oncology Clinic began after a nurse practitioner attended a meeting of the Virginia Council of Nurse Practitioners in March 2006. The topic of bone health was presented, and vitamin D deficiency was discussed as a contributing factor to decreased bone density. Appropriate laboratory testing and interpretation for deficiency were taught, as well as treatment strategies for various levels of insufficiency or deficiency.

The oncology clinic was aware of the potential side effect of decreased bone mineral density from aromatase inhibitors frequently used in treatment of hormone receptor-positive breast cancer (Lonning et al., 2005). Therefore, making appropriate hormonal therapy selections based on patients' histories related to bone health was routinely considered. When using aromatase inhibitors, patients are monitored for decreased bone density with a dual energy x-ray absorptiometry scan every two years and encouraged to take calcium supplements and participate in weight-bearing exercises. In an effort to further promote the bone health of patients, the clinic began checking vitamin D levels in at-risk patients and recommended supplementation when appropriate.

Not long after the routine evaluation of vitamin D levels began in the clinic, a study reported that women on aromatase inhibitors with low vitamin D levels were more susceptible to worsening bone density than those with normal levels (Lonning et al., 2006). Documented evidence then supported

laboratory testing of vitamin D levels in women with breast cancer on these medications.

Other patients in the practice presented with symptoms of vitamin D deficiency or insufficiency. Those needing supplementation include the frail, older adults with an unsteady gait, patients with known osteopenia or osteoporosis, patients in treatment with persistently low calcium levels, and patients prone to falls. Patients with fatigue, depression, and muscle pain or weakness and those persistently confined indoors resulting in decreased sun exposure, with renal insufficiency, and with bone pain may develop vitamin D deficiency (Merck Research Laboratories, 2003; Plotnikoff & Quigley, 2003). In fact, most of the clinic's patients seemed to have the potential for vitamin D deficiency.

## Vitamin D Levels

Vitamin D receptors are found in more than 30 different tissues in the body. A normal vitamin D level is believed to be necessary for optimal functioning of these cells ("Snapshots," 2006). The laboratory used by the clinic reports a normal vitamin D range between 32–100 ng/ml (other laboratories may report different normal ranges). Vitamin D deficiency is defined as a level less than 10 ng/ml and insufficiency is defined as a

level from 10.1–31.9 ng/ml. Vitamin D level is evaluated with the 25-hydroxy vitamin D laboratory test. After testing symptomatic patients in the clinic, a majority had some level of insufficiency and some were severely vitamin D deficient (see Figure 1).

The results of patients whose vitamin D levels were checked from May–September 2006 were analyzed. The numbers of patients tested for the first time from May–September were 86, 89, 72, 59, and 81, respectively. Of those tested, most had a level below 30 ng/ml (75.4%, 84.1%, 66.6%, 69.3%, and 63%, respectively). The most common symptoms seen in the clinic and used to support vitamin D reimbursement are bone and muscle pain, fatigue, and hypocalcemia.

As the nurse practitioner became more aware of the number of patients in the clinic with low vitamin D levels, she began to research the subject more thoroughly. Was treating patients to get them to the low end of normal enough to promote optimal health? Some orthopedic and nutritional therapy researchers have recommended that vitamin D levels should be in the 40–50 ng/ml range to promote optimal health (Bischoff-Ferrari, Giovannucci, Willett, Dietrich & Dawson-Hughes, 2006; Holick, 2006; Vieth, 2006). It became clear in looking at the data collected that, if

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