Vitamin D in Older Patients With Cancer

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Vitamin D insufficiency has been found to be as high as 75% among community-dwelling adults aged 65 and older. The purpose of this article is to provide a review of published literature focused on the benefits of vitamin D and calcium supplementation in older patients with cancer. Insufficient vitamin D levels may have considerable effects on cancer-related diagnosis and treatment. Patient education should include information concerning vitamin D and calcium administration to reduce falls and injury from falls and enhance functional status. This article will consider the issue of vitamin D levels related to cancer prevention, diagnosis, treatment, functional status, and falls in older patients with cancer. Dosing and serum measurement information will be discussed.

Vitamin D insufficiency has been found to be as high as 75% among community-dwelling adults aged 65 and older (Hintzpeter, Mensink, Thierfelder, & Scheidt-Nave, 2007). People aged 70 and older have about 25% less capacity for vitamin D production compared to younger adults (Holick, Matsuoka, & Wortsman, 1989). Insufficient vitamin D levels may have considerable effect on cancer-related diagnosis and treatment (Beer & Myrthue, 2006; Grant & Garland, 2006; Pelczynska et al., 2006; Sieg, Sieg, Dreyhaupt, & Schmidt-Gayk, 2006). Vitamin D also has been found to reduce the risk of premenopausal breast cancer (Abbas, Linseisen, & Chang-Claude, 2007) and has been associated with a decrease in total mortality in the general population (Autier & Gandini, 2007). Other benefits of vitamin D include reduced falls, reduced injury from falls, and enhanced functional status. This research synthesis will consider the issue of vitamin D as related to normative aging, cancer diagnoses, treatment, functional status, and falls in older patients with cancer.

Definition of Vitamin D

According to the National Institutes of Health (NIH, 2005), vitamin D is a fat-soluble substance that is derived from exposure to sunlight. Vitamin D frequently is identified as a vitamin; however, some researchers suggest it is a hormone because manufacturing takes place through sun exposure (Mosekilde, 2005; Wootton, 2005). Several different forms of vitamin D exist, including cholecalciferol (D_3) (NIH) and ergocalciferol (D_2). Cholecalciferol is made in the skin of animals and people (Holick, 2005). Vitamin D is manufactured in the skin after sunlight exposure; cholecalciferol binds to the vitamin D binding protein and is transported to the liver where it is hydroxylated into 25-hydroxy vitamin D (25 OHD) (Wootton) (see Figure 1). The 25 OHD then travels to the kidney where it is hydroxylated to 1,25 OH_2D (Mosekilde). Ergocalciferol is a plant form of vitamin D_2 (Holick) that goes through the same hydroxylation as cholecalciferol (Wootton); 25 OHD often is referred to as calcidiol and 1,25 OH_2D is known as calcitriol (Boonen, Vanderschueren, Haentjens, & Lips, 2006; Wootton). When comparing supplementation with calciferol (D_2) or calcitriol (D_3), calciferol was shown to be less potent and have a shorter duration of action when compared to calcitriol (Armas, Hollis, & Heaney, 2004).

Vitamin D_3 generally is obtained in the diet by consuming fish, fish oils, and egg whites. D_2 and D_3 generally are used as supplementation in milk, bread, and multivitamins (Holick, 2005). The daily requirement of vitamin D is 600 IU (American Dietetic Association [ADA], 2006). However, higher doses of D_3 seem to be necessary to reach the desirable health benefits

At a Glance

- ✦ Vitamin D tends to diminish with age and insufficiency may be as high as 75% in older community-dwelling adults.
- ✦ Vitamin D insufficiency is assessed by serum 25-hydroxy and is defined as levels below 20–25 nmol/l.
- ✦ Those with insufficient vitamin D levels are at risk for falls and poor functional status.

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