



Cancer Treatment-Induced Bone Loss Fact Sheet

About Cancer Treatment-Induced Bone Loss

Hormone ablative therapy (treatment with drugs that stop the production of specific hormones) increases the risk of fractures due to bone loss. Adjuvant hormonal therapies for women with breast cancer involve antiestrogens (e.g., tamoxifen) and aromatase inhibitors, which have been shown to accelerate bone loss and increase fracture risk due to estrogen suppression.¹ Additionally, many men with prostate cancer are treated with androgen deprivation therapy (ADT) (e.g., gonadotropin-releasing hormone [GnRH] agonists) as their cancer progresses. GnRH agonists inhibit production of testosterone, which acts as a growth factor for prostate cancer cells. However, this treatment also leads to a decrease in bone mass, thus increasing the risk of fractures due to osteoporosis.^{2, 3}

Prevalence and Impact

Breast cancer is the most prevalent cancer in the world, accounting for 23 percent of all cancers. Rates are highest in North America, according to the American Cancer Society. Approximately 1 in 8 women in the United States will have breast cancer in her lifetime, with an expected 40,460 dying from the disease in 2007.⁴ The 5-year survival rate is improving, having risen to 83% (for cancer that has spread regionally), mainly due to early detection and treatment.⁴ The majority of women are postmenopausal at diagnosis.

The increased fracture risk associated with treatment-related loss of bone mineral density is an increasingly important problem for women diagnosed with breast cancer. In the US, 92,000 patients with breast cancer are on hormone ablative therapy. Of those patients, 33% are evaluated and diagnosed for bone loss, with only 12% of patients receiving treatment.⁵

Women treated with aromatase inhibitors are at more than a 1.5- to 2-fold higher risk of experiencing vertebral fracture, compared with patients receiving tamoxifen alone.^{6, 7}

Men in the United States have a 1 in 6 chance of developing prostate cancer within their lifetime.⁴ In 2007, there will be an estimated 218,890 new cases of prostate cancer in the United States and approximately 27,000 deaths from the disease.⁴ The incidence of prostate cancer increases exponentially with age — eventually reaching a histologic prevalence of 50% in those 70-80 years of age.⁸ In the US, 239,000 patients with prostate cancer are on hormone ablative therapy. Of those patients, 20% are evaluated and diagnosed for bone loss, with only 3% of patients receiving treatment.⁵ For 1 in 4 men, androgen deprivation therapy (ADT), a standard treatment for prostate cancer, produces skeletal complications such as fracture within 2 years.^{3, 9} To date, limited data have been available on the prevention or treatment of osteoporosis in men receiving such treatment.³

Current Treatments and Guidelines

The American Society of Clinical Oncology (ASCO) recognizes the risk of bone loss due to age and/or treatment in women with breast cancer and recommends regular assessment of bone health in this population. Similar monitoring has been suggested for men undergoing treatment for prostate cancer. Additionally, the ASCO Breast Cancer Bisphosphonate Guideline specifically identifies patients receiving ovarian suppression and/or aromatase inhibitors as being at particularly high risk for osteoporosis, and recommends a baseline DEXA scan in these patients with annual DEXA follow-up.¹⁰ Currently there are no approved treatments for cancer treatment-induced bone loss.



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Role of RANK Ligand in Cancer Treatment-induced Bone Loss

As the essential mediator of osteoclasts (the cells that break down bone), RANK Ligand has been implicated in bone loss across a broad range of conditions including cancer treatment-induced bone loss. RANK Ligand inhibition represents a targeted and specific approach to potentially treating osteoclast-mediated bone destruction.

References

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