Osteoporosis, Fractures, and Risk of Falls

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Osteoporosis in elderly cancer patients is an increasing problem, yet it remains under-recognized and under-managed. We commend Dr. Balducci for writing a comprehensive review of the bone complications associated with cancer and its treatment in the elderly. Dr. Balducci's review demonstrates why oncologists need to become better aware of the ill effects of cancer and its treatment on the bones of their elderly patients. The review clearly outlines the many important unanswered questions and research opportunities in this field. Osteopenia and osteoporosis are generally silent diseases until they are complicated by fractures. Considering that most fractures among older adults are caused by falls,[1] this commentary outlines how to assess which older cancer patient is at risk of fracture and which older cancer patient is at risk for falling in order to prevent significant injury.
Who Is at Risk of Fracture?
Morbidity associated with osteoporosis is due to fractures, therefore assessing risk of a fracture is important. Such assessment involves the identification and modification of clinical risk factors, in addition to measuring a person's bone density. The National Osteoporosis Foundation recommends a comprehensive approach to diagnosing osteoporosis including a detailed history and physical, medication assessment, and use of the Fracture Risk Assessment tool (FRAX).[2] The FRAX tool, developed by the World Health Organization (WHO), is an algorithm that estimates the 10-year probability of a hip fracture or osteoporotic fracture. Clinical features such as sex, weight, height, history of prior fracture, family history of hip fracture, smoking status, steroid use, rheumatoid arthritis diagnosis, and alcohol consumption are utilized. The tool was developed in population-based cohorts from Europe, North America, Australia, and Japan in subjects more than 50 years of age, and it has been demonstrated to be valid and reliable. A web-based version is available at http://www.shef.ac.uk/FRAX/[3]

Who Is at Risk for Falls?
Since the majority of osteoporosis-related fractures result from falls,[1] it is important for oncologists caring for older at-risk patients to identify and modify risk factors for falling. One in three adults over the age of 65 falls each year.[4,5] Falls are the leading cause of accidental death in older people and the most common problem leading to loss of independence.[6,7] The average health care cost of a fall injury is more than $20,000.[8] The functional impairment resulting from the fall often leads the patient to become dependent, and functioning remains below prefall levels.[9] A risk assessment for falling considers the features of the patient, his or her environment, medication use, and personal habits. Significant risk factors have been elucidated in the geriatric literature and are included in Table 1.

Overcash and colleagues, in a prospective geriatric assessment of elderly patients undergoing cancer treatment vs age-matched controls, and using unadjusted rates, found that cancer patients were more likely to fall. They also found that among the patients with cancer, scores on the Activities of Daily Living (ADL) scale were a significant predictor of falls.[10]

**Future Research**

It is well established that one-third of all community-dwelling individuals over the age of 65 years fall every year.[11,12] Cancer and its treatments can increase an elderly patient's risk for falling by contributing to muscle weakness, osteoporosis, neuropathy, and fatigue, all of which can be considered risk factors for falling and subsequent fractures. Therefore, it may be important for oncologists caring for elderly cancer patients to be aware of the risk factors associated with osteoporosis, fractures, and falls. There are many opportunities for further research in this area. Areas that would benefit from more focused research include the prevalence of osteoporosis, falls, and fractures in patients undergoing chemotherapy; effects of chemotherapy-induced menopause or hypogonadism on bone health and fracture-risk differences in bone density, fall risk, and subsequent fractures in patients who have bone metastases vs those who do not; functional and mortality outcomes for elderly cancer patients who fall vs those who do not fall; biological factors associated with bone loss, such as sarcopenia, malnutrition, or frailty; and design and implementation of interventions in an older cancer population found on assessment to be at risk of falling.

Dr. Balducci's article clearly outlines how cancer affects bone health. The next important step is to identify those at risk for falling in order to prevent fractures and subsequent morbidity and mortality.

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**References**


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