Osteoporosis: A concern for ED nurses?

By Cathy Sendecki, BSN, RN, GNC(C)

The diagnosis of osteoporosis is usually a small note in the Past Medical History, an incidental condition compared to other chronic illnesses that could be contributing to the presenting complaint. Some ED visits, however, are directly related and, in other cases, the patient's health may be positively impacted by following up on this insidious condition.

Osteoporosis is a disease characterized by loss of bone mass resulting in weak, brittle bones. Throughout life, bone remodelling occurs, as established bone is resorbed and new osteoblasts replace this tissue. Until approximately age 20, this results in increasing bone mass to peak bone density. From the middle of the fourth decade of age on, the creation of new bone tends to decrease while resorption of previously formed bone continues or increases, resulting in loss of bone mass for men and women. While there is no single cause, some risk factors can increase bone loss. One of the most common involves the hormonal changes associated with menopause, at which time women may lose 2% to 5% of bone mass yearly for five to six years; the rate then decreases to approximately 1% per year. By this time, approximately 20% loss may have occurred. Smoking, excessive alcohol intake, lack of exercise, or a diet low in calcium may contribute. The process generally goes on gradually, without symptoms, and is discovered only when a fragility fracture is diagnosed. At this point, osteoporosis is well established.

This condition may be classified as primary or secondary. Primary osteoporosis occurs when there is no obvious cause of bone loss other than age-related changes, possibly genetically related. Secondary osteoporosis refers to bone loss due to disease conditions such as celiac, hyperthyroidism, rheumatoid arthritis, immobility or to medication such as glucocorticoids, thyroid, or aromatase inhibitors which lower estrogen levels.

Diagnosis is by assessment of bone mineral density, which is compared to that of healthy young adults. The results are expressed as changes in Standard Deviation, "-SD". Low bone mass, termed osteopenia, is present when test results are in the range of -1 to -2.5 SD's below the young adult mean; osteoporosis is diagnosed when the score is less than -2.5 SD. In general, the lower the bone mass, the higher the risk of fracture, but other factors contribute, especially falls.

Common presentations in the emergency department

Presenting complaints usually relate to Fragility Fractures, defined as those caused by a fall from standing height or from a minor injury that would not fracture normal bone. Sites commonly include hip, wrist, vertebrae and humerus.

Management includes the standard emergency care of any fracture, with attention to circulation and pain management. If the injury is due to a fall, assess for possible causes. Was it clearly a slip or trip? Any dizziness? Has an acute illness, such as UTI or ACS contributed? As most of these patients will be older adults, they are at risk for complications specific to this age group, such as delirium, falls, skin breakdown and deconditioning. If the patient does not require admission for surgical treatment, we must ensure they can manage the pain adequately, and are able to mobilize safely and have the necessary assistance at home. A wrist or humerus fracture for someone who requires a walker becomes a major impediment to toileting at night or meal preparation.

If the patient is fit for discharge, she needs information about managing at home, and the importance of ongoing management of osteoporosis. Consider a referral to Home Health for personal care assistance.

Vertebral compression fractures

Vertebral compression fractures occur nearly twice as often as wrist and hip fractures. There may be no known cause. It has been estimated that 30% occur in bed, and many are caused by lifting, bending forward, falling onto the buttocks, coughing or sneezing. The majority of these fractures occur to the anterior aspect of the vertebra as a wedge fracture; some involve the collapse of the entire vertebral body. Most are stable fractures, as the fragments of bone are impacted, but occasionally an unstable "burst fracture" results. Over the days following the initial fracture, further deformity may occur, or even further fractures. Assessment includes a history of any activity when the pain began, and how it has developed; as with other spinal injuries, assessment of sensation and function is needed.

Initially, a few days of bed rest may be required until the pain begins to improve with medication. This puts less pressure on the fractured vertebrae, but carries the risk of deconditioning. The patient needs to know how to turn, transfer and move safely, for example, how to maintain alignment of shoulders and hips. Conscious attention to posture, to sit or stand tall helps to maintain a neutral spine.

Pain management with analgesics and non-pharmacologic measures will generally be needed. Non-steroidal anti-inflammatory drugs (NSAID's) are contraindicated for older adults due to the risk of gastric bleeding and renal compromise. Regular doses of Acetaminophen 325 mg–650 mg four times daily will provide some baseline relief. In addition, opioids will often be required initially. Consider the total daily dose of Acetaminophen when compound agents such as Acetaminophen with Codeine or Oxycodone are prescribed. For frail elderly patients, the maximum recommended dose is 2.6 Gm daily. Ice packs applied for 15–20 minutes hourly are recommended for the first week. After this time, heat may provide more comfort.

Side effects of analgesics and decreased mobility need to be addressed, with attention to fall prevention, such as getting up

slowly and mobilizing once the patient feels steady. Routine laxative use with opioids in addition to adequate fluid and fibre intake will help to avoid constipation.

Vertebral compression fractures are often not well understood by patients and family: "How can I go home with a spinal fracture?" "How long until it heals?" As with other injuries, pain may increase over the next few days before starting to subside, and considerable pain may be experienced for at least six weeks, but is expected to gradually subside. Discharge teaching needs to include education about "red flags" for further attention. In particular, these patients and their caregivers need to know that if worsening pain, decreased strength, loss of control of bowel or bladder or change in sensation occur, they need to return to the ED. Even though their condition is stable now, and improvement is expected, untoward changes can occur. Patients may benefit from a referral to Home Health physiotherapy or occupational therapy to assess function, safety and pain management at home.

The Osteoporosis Canada website, **www.osteoporosiscanada.ca,** is an excellent resource for patients and caregivers. In particular, the section "After the Fracture" is recommended for information on safe movement and activity during convalescence and beyond. For patients without internet access, relevant portions may be printed. This may be an opportunity for younger family members to assist.

The importance of ongoing management

Vertebral compression fractures may be an incidental finding, such as those of unknown age noted on a chest x-ray. Such fractures may contribute to spinal deformity, particularly kyphosis—as this becomes pronounced, posture changes, and chest expansion and digestive function may be compromised.

All patients with a suspected osteoporosis need to follow up with their GP specifically for diagnosis and management of osteoporosis. Medications to slow bone loss or increase new bone formation are indicated. A number of classes of medications are available, bisphosphonates are often prescribed. These all decrease the risk of vertebral fractures, and many also decrease the risk of other fractures, particularly those of the hip and wrist. Adequate calcium, preferably from dietary sources, and supplemental Vitamin D3 are also recommended. Exercise programs geared to those with decreased bone density are available in many communities, and help to prevent falls and further injury.

According to Osteoporosis Canada, more than 80% of fractures in patient's over age 50 are due to osteoporosis. Fractures from osteoporosis are more common than heart attack, stroke and breast cancer combined. Osteoporotic hip fractures account for more hospital bed days than heart attack, stroke, or diabetes. Less than 20% of fracture patients undergo diagnosis and adequate treatment for osteoporosis. At least one in three women and one in five men will sustain an osteoporotic fracture.

This is an opportune time to educate all family at the bedside. This disease has been described as a pediatric disease with geriatric consequences. The importance of good bone health in youth, with adequate diet and exercise needs to be emphasized to younger family members, as well as ongoing healthy choices for all. Fall prevention is paramount, so printed information on home safety, the importance of appropriate footwear, hip protectors and local supports such as Falls Assessment Clinics should be provided. Without treatment, one half of patients who fracture a hip will have a second hip fracture within five years; 20% of those who sustain a vertebral fracture will experience another within 12 months.

Our goal is to make this fracture the last, contributing to a good quality of life for individuals with benefits for the health care system.

About the author

Cathy Sendecki, BSN, RN, GNC(C), has worked at Burnaby Hospital Emergency Department since 1987, in the past several years as Geriatric Emergency Nurse Clinician, as part of the Older Adult Program. Particular interests include working with persons with dementia and their care partners and embracing the challenges of dealing effectively with Elder Abuse. She enjoys being a grandma.

References

Ellert, G., Low, A., & Wade, J. (2011). *The Osteoporosis Book* (3rd ed). Vancouver: Trelle Enterprises Ltd.

Mayo Clinic (2013). Osteoporosis. Retrieved from www.mayoclinic.org

Old, J.L., & Calvert, M. (2004). Vertebral compression fractures in the elderly. *American Family Physician, 69*(1), 111–116. Retrieved from www.aafp.org

Shiel, W. (2014). *Osteoporosis.* Retrieved from www.emedicinehealth.com