Postmenopausal osteoporosis is a common disease that spans those women with asymptomatic bone loss to those with hip fractures. The prevalence of postmenopausal osteoporosis increases with age from approximately 6% at age 50 to more than 50% at age 80 and older.1

In the United States, there are 1.5 million osteoporotic fractures per year with a public health burden estimated at $17 billion to $18 billion in direct costs annually.2 As our population ages, these expenditures will rise. Efforts to prevent these fractures would clearly affect healthcare spending and quality of life which can sharply deteriorate following an osteoporotic fracture.

Assessing risk
Risk assessment of all postmenopausal women should be clinically evaluated to determine the need for bone mineral density (BMD) testing. An improved assessment method to identify postmenopausal women at risk for fractures has recently been addressed by the National Osteoporosis Foundation’s (NOFs) 2008 Clinician’s Guide to Prevention and Treatment of Osteoporosis, which includes the World Health Organization (WHO) Fracture Risk Assessment Tool (FRAX).3

FRAX determines a patient’s 10-year risk of hip and major osteoporosis-related fractures (clinical spine, forearm or shoulder). This risk-factor assessment tool incorporates the following factors:

- race
- age
- sex
- weight
- height
- previous history of fracture
- current smoking
- glucocorticoid use
- a diagnosis of rheumatoid arthritis
- secondary causes of osteoporosis and alcohol consumption

Additionally, a femoral neck BMD score is used in the risk calculator. Increased fracture probability according to FRAX is a 10-year risk of 3% or more for a hip fracture and 20% or more for major osteoporosis-related fractures. The FRAX calculator is online at www.shef.ac.uk/FRAX/index.htm.

The use of dual-energy X-ray absorptiometry (DXA) of the hip and spine is the technology used to establish or confirm a diagnosis of osteoporosis, predict future fracture risk and monitor patients by performing serial assessments.4

BMD using DXA is measured in T-scores. A T-score is the number of standard deviations the BMD measurement is above or below the young normal mean BMD. The new T-score treatment thresholds are -2.5 or less at the femoral neck, hip or spine regardless of clinical risk factors (osteoporosis) or a T-score between -1.0 and -2.5 at the femoral neck, hip or spine (osteopenia) with risk factors.

Other bone densitometry technologies, such as peripheral DXA, quantitative computed tomography (QCT) and quantitative ultrasound (QUS) densitometry, can be used. However, data from these sources...
are not equivalent to T-scores from DXA and cannot be used in the WHO diagnostic classification. Finally, biochemical markers such as N-telopeptide or osteocalcin can be measured but do not help in making a diagnosis or determining treatment.

The combination of NOF recommendations and FRAX risk factors will identify most women who need to be treated. However, there are potential difficulties with these criteria that may lead to inconsistent recommendations. In the FRAX mode, previous fractures not related to osteoporosis are not clearly defined. In addition, there is no allowance for dose or duration of glucocorticoid treatment.

Patients with arthritis may assume they have rheumatoid arthritis when in fact they do not. All secondary etiologies are not included in the FRAX calculation of risk when BMD is inserted into the model. There is no range of error for the 10-year fracture risk so some women may be treated even though they do not need to be treated. Finally, some women with poor T-scores and no risk factors would fall below the 10-year threshold. Good clinical judgment must be used in the decision-making process.

Recommendations

The majority of osteoporosis-related fractures are due to falls. Therefore, poor vision, muscle weakness, unsteady gait and balance, visual defects and a history of falling should be taken into account. Dehydration, arrhythmias and orthostatic hypotension can also lead to falls. These factors alone can increase the risk of fracture independently of scientific technologies and must be included in determining treatment in these women. Good clinical judgment must be used in the decision-making process.

The qualitative and quantitative deterioration in the trabecular and cortical skeleton is responsible for the occurrence of fractures in postmenopausal women. Treatments for these women are focused on bone-specific medications.6 Calcium supplementation, vitamin D and physical activity all reduce fracture risk. When an increased risk of fracture is determined by NOF guidelines, FRAX-aggressive intervention with pharmacologic agents is available. There are two main classes of drugs to treat osteoporosis. One consists of antiresorptive agents that block bone resorption. This takes place by inhibiting the activity of osteoclasts. The other consists of anabolic agents that stimulate bone formation by acting primarily on osteoclasts.

Antiresorptive agents include bisphosphonates, hormone therapy (HT), selective estrogen receptor modulators (SERMs), calcitonin and strontium ranelate. Bisphosphonates are the most widely prescribed antiresorptive agents and are often considered first-line therapy in postmenopausal osteoporosis. Alendronate, risedronate, ibandronate and zoledronic acid have all been shown to reduce hip, vertebral and nonvertebral fractures. And, all are approved by the Food and Drug Administration (FDA).

Alendronate, risedronate and ibandronate come in oral forms. Zoledronic acid and ibandronate are intravenous (IV) preparations that are given yearly and every three months respectively. A recent study7 has shown that the yearly infusion of zoledronic acid may provide osteoporotic protection for two years.6 In cancer patients, reports of osteonecrosis of the jaw has been documented with the IV medications but the incidence appears small.7 There has also been a 1% risk of atrial fibrillation with zoledronic acid.9 Side effects of the oral agents are mainly associated with the gastrointestinal system.

HT has undergone much scrutiny since the Women’s Health Initiative (WHI) study. Although the beneficial effects of HT are well documented, the other risks associated with HT preclude it from being used solely for the prevention of osteoporosis. Calcitonin’s usefulness has been limited by questionable study designs and strontium ranelate is not approved by the FDA. SERMs, such as raloxifene, are indicated...
for the reduction in risk of invasive breast cancer in postmenopausal women with osteoporosis. While it reduces the risk of vertebral fracture, it has no effect on the risk of nonvertebral fractures. These initial findings were confirmed by the Continuing Outcomes Relevant to Evista (CORE) study in 2005.

Anabolic agents, sodium fluoride and parathyroid hormone, have been investigated. Sodium fluoride has not been effective in reducing fracture risk. Parathyroid hormone is costly and its safety has not been demonstrated beyond two years. In addition, combination therapy is not superior to single-agent treatment.

Final note
The newest NOF guidelines and the FRAX assessment provide physicians with assistance in clinical decision making when treating patients with postmenopausal osteoporosis. Physicians must remain lifelong learners as advances in identifying, diagnosing and treating these women continue to evolve.

References


4. Lewiecki EM. Crisis in osteoporosis care. The Female Patient 2009; 34(1);17-18.


