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BONE DENSITY SCREENING (DEXA SCAN)

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Osteoporosis

Osteoporosis is the most common bone disease affecting humans. It is characterized by reduced bone mass accompanied by architectural deterioration of the skeleton. This results in an increased risk for fracture. This disease has no warning signs.

Most cases of osteoporosis occur in women after menopause. In the USA, 20 percent of Caucasian women aged 50 and over have osteoporosis. Another 35 to 50 percent have low bone mass. The risk for osteoporosis increases with age, rising from only 4 percent for women 50 to 59 years old, to 52 percent for women age 80 and older. Up to 90 percent of all hip and spine fractures in Caucasian women aged 65 to 84 can be attributed to osteoporosis. Lifetime risks of a hip or vertebral fracture for a 50 year old Caucasian woman are 17.5 percent and 15.6 percent, respectively. African-American women have about one third of this fracture risk.

Hip fractures increase the mortality rate by 20 percent during the following year. Hip fractures carry a 25 percent risk for long term care, and a 50 percent risk of long term loss of mobility. Vertebral fractures may cause substantial pain as well as a loss of height and exaggerated curvature of the upper spine — called thoracic kyphosis.

Vertebral fractures in the upper spine can cause restriction of lung function; in the lower spine they can cause digestive problems. Osteoporosis also leads to tooth loss. Hip and vertebral fractures and the resultant pain, loss of mobility, and loss of independence can lead to depression, and anxiety. The fear, anger, frustration, and loss of self-esteem that may be experienced as a consequence of osteoporosis can have significant effects on one's personal relationships and quality of life.

Medical costs associated with osteoporosis were estimated at $14 billion in 1995, compared to $9.5 billion for breast cancer.

Risk Factors

The greatest influence on maximal bone mass is heredity. Female children of women who have osteoporotic fractures have less bone mass than would be expected for their age.

Several lifestyle factors affect the risk of developing osteoporosis. These include nutrition, physical activity, cigarette smoking, and heavy

alcohol consumption. Both calcium and vitamin D have well-known roles in bone metabolism. Adequate calcium intake is required for someone to achieve their genetically determined peak bone mass. After peak bone mass is attained, proper nutrition is important for maintaining optimal bone mass and strength.

Regular exercise has been associated with reduced fracture risk. Weight-bearing exercise (such as walking) has a positive effect on the skeleton, and high-impact exercises (such as running, step aerobics, and gymnastics) provide the greatest effect. Regular exercise also appears to reduce the risk of falls.

Women smokers tend to lose bone more rapidly, have lower bone mass, and reach menopause two years earlier than their nonsmoking peers. Some data show that postmenopausal women who smoke have higher fracture rates. Evidence suggests that cigarette smoke interferes with calcium absorption and lowers estrogen levels.

Heavy alcohol consumption (defined as 7 ounces or more per week) increases the risk for falls and hip fracture. However, moderate alcohol consumption in women older than 65 seems to increase bone density and decrease the risk for hip fracture.

The increased rate of bone resorption after menopause clearly indicates a hormonal influence on bone mass in women. Women who experience menopause prior to age 40 are at greater risk of osteoporosis.

Evaluation

All postmenopausal women should be assessed for risk factors associated with osteoporosis. Testing is indicated for all women 65 years of age or older, regardless of risk factors. Testing is also indicated for all postmenopausal women younger than 65 with one or more of the following risk factors: a fracture after menopause, weight under 127 pounds, or a history of a first degree relative who has experienced a hip or vertebral fracture.

Bone mineral density testing can be done using several techniques. Dual energy X-ray absorptionmetry (DEXA) remains the “gold standard” for testing. The results of this test are reported as a T-score. A T-score of minus 2.5 is defined as osteoporosis. Every unit decrease in the T-score is associated with 10 to 12 percent loss of bone density, and increases the risk of any fracture 1.5 times. Every unit decrease in the T-score at the hip increases the risk of hip fracture 2.6 times. Therefore, a T-score of minus 2.5 represents a 25 percent loss of bone, a 175 percent increase in risk of any fracture, and a 325 percent increase in risk of hip fracture. At the same T-score of minus 2.5, the risk of fracture increases with age — a 75 year old has 8 to 10 times the ten year fracture risk as a 45 year old.

In untreated women, a repeat DEXA scan should not be done for three to five years.

For women receiving treatment for osteoporosis, monitoring with DEXA scan should be done at most every two years.

Lifestyle Approaches

A balanced diet is important for bone development as well as general health. Eating more fruits and vegetables, and minimizing the intake of fats improves bone health. For women over 75 years old, adequate protein intake (10 grams per day) may help minimize bone loss. Calcium and vitamin D are important for bone health. After menopause, calcium intake should be 1,500 mg per day in divided doses. Spinach, tea, rhubarb, and wheat may interfere with calcium absorption. Dairy products are among the best sources of calcium. Avoid consuming more than 2,500 mg per day of calcium. The National Osteoporosis Foundation recommends 800 IU of vitamin D per day. The safe upper limit for vitamin D is 2000 IU per day. In women over 75 years old, magnesium supplements may be needed. Exercise programs for those over 65 reduce the risk of falling by 10 percent, and programs that include training for balance reduce the risk by 20 percent. For bone benefits, the addition of muscle strength training is advised. Smoking cessation and alcohol avoidance are important for bone health. Alcohol intake should be less than 7 ounces per week. Fall prevention is critical, especially for elderly women. Factors associated with an increase risk of falling include: history of falls, fainting, loss of consciousness, muscle weakness, dizziness, impaired coordination, balance problems, or impaired vision. Safety hazards include poor lighting, obstacles, and throw rugs.

Medications

Osteoporosis treatment should be considered in the following groups: postmenopausal women with a T-score worse than minus 2.5, postmenopausal women with a T-score between minus 2.0 and minus 2.5 with additional risk factors, and all postmenopausal women with a history of a vertebral fracture. Treatment options for osteoporosis include: estrogens, calcium, bisphosphonates, raloxifene, vitamin D, and calcitonin. Your treatment should be discussed with your health care provider.

Questions

How much radiation will I be exposed to with a DEXA scan? A DEXA scan exposes you to significantly less radiation than a routine chest X-ray.

How accurate is a DEXA scan? The error is about one percent; this is why it is not useful to repeat DEXA scans at intervals of less than two to three years. For even during the years of “rapid bone loss” which occurs immediately following menopause, the average bone loss rate is only 1 to 1.5 percent per year.

Multicare Associates has recommended that you schedule a DEXA scan because:

- You are over 65 and your last DEXA scan was over 3 to 5 years ago.
- You are less than 65, but have risk factors for osteoporosis: any postmenopausal fracture, weight less than 127 pounds, or have a first-degree relative who has had a hip or vertebral fracture, and your last DEXA scan was over three to five years ago.

- You are receiving treatment for osteoporosis and your last DEXA scan was more than two years ago.

Please schedule your DEXA scan at our Fridley office (763) 785-4500. Your DEXA scan will take about 30 minutes. Your results will be mailed to you in several weeks.