Looking out for Osteoporosis in a Woman's Health Check-up

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Assessment of bone mass, identification of fracture risk, and determination of who should be treated are the optimal goals when evaluating patients for osteoporosis.

"It's time, once again, for my annual checkup." Most women understand that this involves a cervical PAP smear and possibly a mammogram. However, few women think about their bones' health and consequently fail to give it its due importance.

Peak bone mass is achieved by age 30. After that, as breakdown outstrips formation, bones slowly decrease in density. If the body is unable to maintain an adequate amount of bone formation, bones continue to lose density and become increasingly fragile, eventually resulting in osteoporosis. In women, the decrease in bone loss accelerates for five to ten years after menopause.[1] Thus, attention to skeletal health should be paid to prevent osteoporosis and consequently fractures.

Osteoporosis

Osteoporosis is a chronic condition of multifactorial aetiology and is usually clinically silent until a fracture occurs.[2] It is the most common metabolic bone disorder and an increasingly significant problem, affecting 200 million individuals worldwide.[3] The World Health Organization estimated the prevalence of osteoporosis in western women at any site as 14.8% in women aged 50-59, 21.6% for ages 60-69, 38.5% for ages 70-79, rising to 70% in women aged 80 or more.[4]

In 1990, there were 1.7 million hip fractures worldwide. With changes in population demographics, this figure is expected to rise to 6 million by 2050.[5] Often, osteoporosis is undertreated and underrecognized, in part because it is a clinically silent disease until it manifests in the form of fracture, most commonly of the hip, spine and wrist. As populations age, the number of osteoporotic fractures in elderly people will increase. Additional risk factors, such as urbanization, with the consequent increase in harder surfaces, will also result in greater number of fractures.[5]

Risk Factors for Osteoporosis

Osteoporosis can be primary or secondary. A female aged 60 years and over with a family history of osteoporosis has the highest risk for primary osteoporosis. A large risk factor study of 7782 women aged 65 years and older (with a mean age of 73.3 years) identified seven variables:

- Age
- BMD T-score
- Fracture after age 50 years
- A parental history of hip fracture especially maternal hip fracture after age 50
- Smoking status
- Thin body type with weight less than or equal to 57 kg or a low body mass index (< 19)
- Use of arms to get up from a chair.[6]

Additional risk factors for osteoporosis include:
- Early menopause (age <45)
- Use of systemic corticosteroids
- Excess alcohol intake
- Hypogonadism
- Physical inactivity.[7]

Special attention must be given to patients suffering from other diseases or who are taking medications that might lead to secondary osteoporosis. Such diseases include Chronic renal failure, Cushing's disease, Hyperparathyroidism, Hyperthyroidism, Hypogonadism and Diabetes Mellitus. Corticosteroid use of 5 mg/day or more over 3 months, barbiturate and anticonvulsant therapy can all lead to secondary osteoporosis.

Risk factors for low bone mass are not sufficiently sensitive for diagnosis or exclusion of osteoporosis. Only bone mineral density (BMD) measurement can identify patients who have a low bone mass.[7] However, routine global BMD testing is cost-prohibitive.[8] Several decision rules have been developed to identify postmenopausal women who may be selected for dual-energy x-ray absorptiometry (DEXA) scans for BMD measurements. One must look at the age of the patient as well as her weight and height to calculate her BMI (BMI less than 19 predisposes to osteoporosis). Other risk factors should also be considered, especially family history of osteoporosis, smoking status and any low-trauma fractures. Studies[9] have proved that in younger postmenopausal women, such an approach is useful to screen and assess the need for BMD scanning.

Bone Mineral Density Scans

DEXA scanning is today's established standard for measuring bone mineral density. It is also effective in tracking the effects of treatment for osteoporosis and other conditions that cause bone loss. It can assess an individual's risk for developing fractures. However, it cannot predict who will experience a fracture.

Despite its effectiveness as a method of measuring bone density, DEXA is of limited use in people with a spinal deformity or those who have had previous spinal surgery. The presence of vertebral compression fractures or osteoarthritis may interfere with the accuracy of the test.

The World Health Organization has used BMD to define specific diagnostic categories. It should be noted that all 'normal' values of BMD are based on Caucasian data. The T-Score is a mathematical description of the deviancy of the individual from the mean of a reference population. A T-Score >-1 is normal. A T-Score -i to -2.5 means osteopenia and a T-Score ≥-2.5 means osteoporosis.

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The Z-Score is an age-related score to identify patients whose bone mass is lower than that of individuals of the same age. A Z-Score ≥ 1.5 means that there might be secondary causes for osteoporosis.

Monitoring osteoporosis treatment using DEXA scanning is a controversial issue. Some doctors recommend DEXA scanning at 1 to 2 year intervals to monitor changes in bone density during treatment. In clinical practice, serial BMD measures have some clinical utility in monitoring response to therapy, but it is important to keep in mind that fracture-protection benefit may be realized before BMD gains are detected. If there is no change in BMD, it does not mean that the therapy is not working, because treatment may have prevented bone loss.

Prevention and Treatment of Osteoporosis

All patients should be advised to have a healthy, balanced diet rich in calcium and Vitamin D. Calcium is crucial for strong and healthy bones whilst vitamin D is important to help absorb calcium from food. The skin can usually make enough vitamin D when exposed to daylight. However, the use of sunblock creams prevents this effect of sunlight and it is now thought that many individuals are vitamin D deficient. Thus, individual patients may need calcium and vitamin D supplements.

- A scanty guideline for patients would be that it is sensible to try to eat 3–4 portions of calcium a day. Milk, yogurt, cheese, nuts or seeds, bread, leafy green vegetables and fish with edible bones are all sources of calcium.[10]
- Eating a balanced diet with at least 5 portions of fruit and vegetables a day should ensure that the patient gets enough of other important nutrients too.
- Activities such as climbing stairs, brisk walking or dancing – known as 'weight-bearing' exercises – help make bones stronger. Doing these exercises for 30 minutes, five days a week is ideal, but every little bit helps. Certain exercises also help the patient's balance, making it less likely for them to fall.
- Smoking increases the risk of osteoporosis so the patient should be advised to quit if she smokes.
- Sensible alcohol consumption doesn't seem to increase the chance of developing thin bones, but long-term heavy drinking might.[11,12] For this and other reasons, it's not wise for women to drink more than 14 units of alcohol per week, with intake spread out over the whole week.

Once osteoporosis is diagnosed, the goals of treating it are to prevent fractures, stabilize or achieve an increase in bone mass, relieve symptoms of fractures and skeletal deformity and maximize physical function. Treatment should include:

1. Lifestyle and nutritional advice (as described before)
2. Drug therapy
3. Assessment and management of risk of falls, particularly in the elderly.

According to the PRODIGY guidance, first-line treatment should include Alendronate (Fosamax®), Risendronate (Actonel®) or Ibandronate (Bonviva®). Strontium ranelate (Protelos®) is to be used as second-line treatment. However, there exists some controversy about this being used as first-line treatment. If the above fail, other treatments are available and these include Raloxifene (Evista®), Calcitonin, Cyclical Etidronate, Hormone Replacement Treatment and Teriparatide (Forsteo®).[13]

Osteoporosis creates a huge socioeconomic burden of disease and disability. Identifying high-risk groups and using preventative treatment can result in a substantial reduction in morbidity and mortality. However, prevention should start early on in life, promoting increased calcium and vitamin D intake and daily regular weight-bearing exercise. Most women do not require a bone density examination till they reach the age of about 50 years, but this depends on the patient's risk factors. In the postmenopausal years, besides dietary advice, more emphasis should be given to screening for osteoporosis.

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