

Osteoporosis

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Definition

Osteoporosis is a disease in which the bones are thin and porous.

Introduction

Our bodies contain more than two hundred bones. Bones form our skeletons, and they give us shape and strength. They protect our brains and other vital organs. They provide a bank for large amounts of calcium and phosphorus that the body needs for a variety of metabolic functions. Bone tissue is in a constant state of activity building up, tearing down, and repairing itself. During normal childhood and adolescence more bone is built than is removed. Healthy young adults in their mid-twenties and thirties have bones that are as strong and dense as they will ever be. After early adulthood more bone is removed than is built or replaced. Osteoporosis occurs when too much bone is lost. It is usually painless until a bone breaks. It is responsible for 1.5 million fractures a year and affects 25-30 million Americans of whom 80% are women.

A number of risk factors have been identified that are associated with development of osteoporosis. These are:

1. Family members with osteoporosis
2. Insufficient calcium in the diet
3. Sedentary (not physically active) lifestyle
4. Thin build
5. No pregnancies
6. Use of certain drugs such as corticosteroids, excessive thyroid hormone, and some anticonvulsants
7. Early menopause
8. Cigarette smoking
9. Excessive alcohol intake
10. White or Asian racial background

The most common type of osteoporosis is Postmenopausal osteoporosis. It is caused by lack of the main female hormone estrogen. Osteoporosis can occur in men and it does but much less frequently than in women. Senile osteoporosis occurs in people over the age of seventy, but it is still twice as common in women as in men. Osteoporosis can also occur as a result of other diseases like chronic renal failure, liver failure, anorexia nervosa, malabsorption and disorders of the thyroid, parathyroid and adrenal glands. There is even a type called Idiopathic juvenile osteoporosis in which we have no clue as to the cause.

The research regarding osteoporosis among individuals with developmental disabilities is not extensive, but an increased prevalence of osteoporosis has been reported in both males and females with mental retardation. They have lower bone mineral density than individuals their same age without mental retardation, and this is especially true for individuals with Down Syndrome. Fracture rate among individuals with developmental disabilities has been shown to be 1.7-3.5 times greater than in the general population.

Diagnosis

Osteoporosis is diagnosed by a bone density test. X-rays can detect thin bones and fractures, but the bone density test is more accurate. It takes 5-15 minutes to perform. It is painless and safe. Further tests may be needed to rule out other conditions that can cause osteoporosis.

Prevention and Treatment

Prevention is better than treatment. Prevention of osteoporosis involves increasing or at least maintaining bone density. The four keys to prevention of osteoporosis are:

1. A diet rich in calcium and vitamin D
2. Weight bearing exercise
3. Avoiding smoking
4. Avoiding excessive alcohol consumption.

Prevention begins with a diet that contains adequate calcium and vitamin D. Calcium rich foods include dairy products (milk, yogurt and cheese,) broccoli, kale, bok choy, salmon, sardines, tofu and calcium fortified orange juice. ("Dairy Sources of Calcium", "Calcium in Foods") Recommended calcium intake varies with age. Calcium may also be provided in tablet form. Many products are available in drugstores. The daily recommended intake of vitamin D is 400 units. Vitamin D is found in fortified milk and egg products. Our skin makes vitamin D when it is exposed to sunlight. Ten minutes of sunshine a day does the trick. Vitamin D is an ingredient of most multivitamin products as well.

The next step in the prevention of osteoporosis is exercise, especially weight bearing exercise. Walking, jogging and aerobics are forms of weight bearing exercise. For non-ambulatory individuals physical therapists and occupational therapists can often come up with other alternatives. Avoiding smoking and excessive alcohol consumption are two more ways to ward off osteoporosis.

Treatment of osteoporosis is aimed at increasing bone density. Several types of drugs are available. These include:

1. Calcium and vitamin D supplements
2. Hormone Replacement Therapy (HRT) for postmenopausal women
3. Selective Estrogen Receptor Modulators (SERMs) (not enough data is available on these agents yet)
4. Biphosphates (Fosomax)
5. Calcitonin
6. Slow release fluoride (not commercially available yet.)

Although a great deal has been written about treatment of osteoporosis in postmenopausal women there is almost nothing written about treating young people in general and individuals with developmental disabilities in particular. Clearly everyone should be provided adequate calcium and vitamin D. HRT is an option for postmenopausal women with developmental disabilities, but "unopposed" estrogen replacement therapy increases the risk of endometrial cancer (cancer of the lining of the uterus.) Use of progesterone along with the estrogen may reduce the risk of endometrial cancer but may increase the risk of breast cancer slightly after ten years of therapy. Women can get a mammogram every year, and that can aid in the early detection of breast cancer. The decision to use HRT is one that must be made by the individual, the physician and the individual's guardian when applicable. The biophosphate alendronate (Fosomax) is available by prescription. Because it is poorly absorbed by the intestinal tract, Fosomax needs to be taken on an empty stomach with a full glass of water one half an hour before anything else (including food, calcium or any other medication) can be taken by mouth. Some people get nausea and heartburn from Fosomax. The newest treatment for osteoporosis is Calcitonin, a hormone that is given by injection or by nasal

spray. It is not as powerful as estrogen or Fosomax., and no studies of it's use in individuals with developmental disabilities is available.

Bone fractures that result from osteoporosis must be treated by immobilization, casting or surgery.

Emergency Situations – What can go wrong?

Osteoporosis is often unsuspected until a fracture occurs. Fractures may be seen after a fall or other traumatic event (being hit by a car, being involved in a bike or automobile accident.) They may also occur with minimal or no apparent trauma at all (during dressing, bathing or positioning.) There may be a cracking sound or a pop at the time the fracture occurs or the individual may just suddenly cry out in pain. It is not unusual just to find swelling (with or without bruising) when the fracture involves one of the bones of an extremity. Some individuals just seem more uncomfortable than usual. Some seem to have an increase in "behavior problems."

When a fracture is suspected:

1. Call the PCP
2. Go to emergency room or X-ray facility to which he/she has directed you
3. Do not call 911 for a simple fracture - it is not that kind of an emergency.

Conclusion

Osteoporosis occurs when bone becomes thin and porous. It is often silent and goes undiagnosed until a fracture occurs. A number of risk factors have been identified that are associated with the development of osteoporosis. In addition, it is known that individuals with developmental disabilities are at greater risk for both osteoporosis and fractures than the general population. Prevention is better than treatment. Diet and exercise are the mainstays of prevention of osteoporosis. Treatment is available but little data is available regarding use of these therapies in individuals with developmental disabilities.

References

Center, J., Beange, H., McElduff, A. "People with mental retardation have an increased prevalence of osteoporosis: a population study" *American Journal on Mental Retardation* v. 103, no. 1 (July, 1998) pp. 19-28.

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