OSTEOPOROSIS AND ITS EFFECTS

SYED RIAZ BAQUAR*

Osteoporosis is a disease of old age, especially in women of post menopause age. According to report (1994) out of 24 million American, 80% of them women, suffer from osteoporosis. This disorder is a progressive condition in which bone lose mass and become extremely brittle and tend to break. The disease causes an abnormal decrease in the amount of bone tissue in the skeleton. The loss of density reduces the strength of bones and increases the likelihood of fracture. Approximately 70% of fracture occurring in persons of 45 or older year of age, is attributed to osteoporosis.

During lifetime, older bones tissues constantly break and resorbed and replaced by new bone tissue. When an imbalance occurs, in this natural loss and replacement process, osteoporosis develops causing an excessive decrease in the amount of bone. Both men and women lose some bone mass as they grow older. However, the rate of loss is much slower in men as compared to women and osteoporosis is a problem of lesser magnitude for men. It occurs more frequently in women, more in white than black. Women who live to the age of 80 usually lose one third to two-third of their entire skeleton and up to six inches of their height.

The bone loss begins in women in mid 30s, some 10 to 15 years before start of menopause at a rate of 0.5 to 1.0% per year, increasing up to 2-5% in the first 10 years after menopause and then falls to about 1% per year. Surveys indicate that a minimum of 10% of women over 50 years of age in U.S. suffer from bone loss severe enough to cause hip, spinal or large bone fractures. The female-male ratio for spinal (Vertebral) fracture is 8:1. Decrease bone mass is one of the most major factors contributing to hip fracture in women over the age of 65.

The loss of bone in women, due to old age, begins as early as the 3rd decade of life, usually without any symptoms. The earliest sign may be either a loss of height or a straight curvature of the upper back, known as dowager's hump, accompanied by pain in mid or lower back. When more severe, fracture may occur in the lower spine or hip, and acute pain in upper thigh, hip, lince or ankle.

Secondary forms of osteoporosis may be caused due to some other diseases such as diabetes, some hormonal imbalance, such as excessive parathyroid hormone, certain surgeries as removal of ovaries or chronic unmbilization.

CAUSES

The main cause of osteoporosis in menopausal female is a deficiency in estrogen. Among other causes maybe the body’s decreasing ability to absorb sufficient amount of calcium through the intestine, a calcium-phosphorous imbalance, a lack of exercise, jaundice, gastrectomy and lactose intolerance some other reasons maybe excessively smoking, excessive use of alcohol, exposure to toxic chemical cadmium, certain prescription drugs, excessive consumption of sugar. This results into depletion of phosphorous from the body. Use of soft drinks upset the calcium / phosphorous balance required by the body and caffeine which reduces blood calcium level.

TREATMENT OF OSTEOPOROSIS

The reason that leads to osteoporosis as described above, may be avoided. This will minimize the risk factor. Some drugs that cause bone loss, such as cortisone preparation, thyroid hormone and diuretics should be properly monitored and appropriate dose should be administered. Those women who are in the menstruation stage should be provided with at least 1.0 gram of calcium per day. For postmenopausal women, estrogen may be given under advise from the doctors. If that is not possible, calcium intake should be increased to 1.5 - 2.0 gram per day. A hormone, calcitonin, which suppresses the rate of bone loss is recommended. In older women, who are about 70 years of age estrogen treatment has been reported to be not very effective and hence, hormonal and calcium supplement is recommended.

All these therapies help only in reducing the bone loss. Attempt is being made to develop new drugs that will increase the bone mass.

Women suffering from congestive heart condition or migraine cannot take estrogen and therefore they are recommended plant estrogen or phytoestrogen obtained from soybeans. This may reduce osteoporosis without causing risk of breast or uterine cancer. A substitute for

* Professor of Pharmacognosy and Editor-in-Chief, J. Baqai Med. Univ., Karachi.
synthetic progesterone (progestin) has been reported from wild yam (Dioscorea sp) which is a natural progesterone and is safer and effective.

It has been suggested that a treatment programme combining diet, nutritional supplement, and natural transdermal progesterone is 100% successful in building bone mass. The average increase in bone mass in woman with postmenopausal osteoporosis is about 15%. Natural progesterone has not been recommended for both premenstrual syndrome (PMS) and as menopausal hormone replacement therapy.

**ESTROGEN REPLACEMENT THERAPY**

As mentioned above estrogen and calcium supplement are safe as well as effective treatment, though this cannot rebuild already lost bone. However it can greatly decrease the incidence of fracture and reduce further loss of bones. It has also been reported that small doses of estrogen substantially lower the risk of breast cancer and decrease the incidence of heart attack, probably because of increase in HDL cholesterol level. In order to protect bone breakage for a long term basis the use of estrogen should be continued for up to seven years after menopause.

**EXERCISE**

Exercise also helps prevent osteoporosis. Bones, being fluid tissue, are constantly broken and reformed throughout one’s lifetime. Up until the age of 35, more bone is deposited than removed resulting into a gain in bulk and strength. In some cases, at the age of 35 or even earlier, the balance gradually begin to reverse, leading to osteoporosis of fracture. Exercise that increase calcium absorption and bone mass are recommended in order to avoid osteoporosis. Women who exercise regularly tend to have lower estrogen levels and are thinner and display slower rate bone loss. Active woman show significant gain in bone mass as compared to sedentary woman who show a loss of bones. Not only that the exercise can slow the rate of bone loss but also increase person’s stability, strength, flexibility and neuromuscular function and decrease the likelihood of bone breaking and increase bone density. Studies have shown that physically active women of the age 40 to 54, have significantly higher bone mineral density in their spines and arms than those who do not exercise.

Osteoporosis can be controlled by improved nutrition, calcium supplements, regular exercise and lifestyle free from alcohol and tobacco. Calcium can be obtained from a lot of different sources such as cheese, shrimps, oysters, molasses, nuts and seeds, oat, soybean, sea weeds, yughurt, whole wheat products. Among vegetables such as turnip, broccoli, kale, leafy green vegetable are also good sources of calcium. Sardine and Solman fishes contain high percentage of calcium.

Phosphate containing drinks, high protein animal food deplete the body of calcium. Citrus fruits and tomatoes may inhibit calcium absorption. Low fat dairy products are recommended. High protein diet with calcium, magnesium, phosphorous and Vitamin C and D can prevent and treat osteoporosis. Elderly people who have difficulty in absorbing sufficient amount may need calcium injections. Calcium citrate, calcium carbonate or calcium lactate are easily absorbable by the body. Magnesium can be found in nuts, seeds, fish, seafood, whole grain, legumes and dark green leafy vegetable. Vitamin D is found in egg yolk, fortified milk, butter and fish liver oil.