

Effective Osteoporosis Prevention in Nigeria: Implications for Health Education

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Abstract

Osteoporosis is a disease characterized by low bone mass and loss of bone tissue that may lead to weak and fragile bones. Osteoporosis is often considered to be a condition that frail elderly women develop. However, the damage from osteoporosis begins much earlier in life. Because peak bone density is reached at approximately 25 years of age, it is important to build strong bones by that age, so that the bones will remain strong later in life. Adequate calcium intake is an essential part of building strong bones. According to the international osteoporosis foundation in an extrapolated statistic, nearly 2million people in Nigeria has osteoporosis, In the United States, nearly 10 million people already have osteoporosis. Another 18 million people have low bone mass that places them at an increased risk for developing osteoporosis. As our population ages, these numbers will increase. About 80% of those with osteoporosis are women. Of people older than 50 years of age, one in two women and one in eight men are predicted to have an osteoporosis-related fracture in their lifetime. Significant risk has been reported in people of all ethnic backgrounds. Osteoporosis is a worldwide health concern. Preventing osteoporosis, and subsequent fractures, has become a goal of many health care practitioners.

Keywords: osteoporosis, effective, prevention, health education.

Introduction

“Osteoporosis” literally means “porous bone.” It is called a silent disease because there are often no symptoms of bone loss until the bones become so weak that a sudden strain, bump, or fall causes a fracture. Such fractures are typically of the hip, ribs, vertebrae, or wrist. People tend to associate osteoporosis with frail, elderly women. However, osteoporosis can also strike the young. Osteoporosis is a condition that causes your bones to weaken and to break or fracture easily. As many as 1 in 2 women and 1 in 4 men will suffer from a fracture in their lifetime (Lie, 2000).

This bone thinning disorder is common among postmenopausal women. Yet, it can develop in younger women as well as in men. In 2001, the U.S. National Institutes of Health reported that osteoporosis affects “as many as 15-20 million individuals in the United States.” Each year in the United States, osteoporosis is blamed for about 1.3 million fractures in people aged 45 and older. This costs \$3.8 billion annually (Seeman, 2000). According to Rise Clinic Nigeria (2014), 40% of women who are 50years plus will experience an osteoporosis related fracture in their lifetime.

John (2009) explained that although the symptoms of osteoporosis are most visible in the later years, the process that weakens bones actually begins 30-40 years before the first fracture occurs. After age 35 both men and women begin to lose bone mass. As the bones become lighter and thinner, fractures can occur more easily and may heal slowly because the body is not able to form new bone as easily as it once was. The precise cause of osteoporosis is not known, but inadequate calcium and vitamin D in the diet, reduced oestrogen levels in women and insufficient exercise may all contribute to its development”.

Jose (2002) noted that one of the common symptoms associated with menopause is bone strength loss. It states: “Osteoporosis, literally porous bones, is a common and important health problem for women after menopause.”

A Serious Health Threat.

The International Osteoporosis Foundation (1998) reported that “in the European Union, someone has a fracture as a result of osteoporosis every 30 seconds.” In the United States, 10 million

people have osteoporosis, and another 34 million are at risk because of low bone mass. Furthermore, the U.S. National Institutes of Health reports that “one out of every two women and one in four men age 50 and over will have an osteoporosis-related fracture in their lifetime.” And the outlook is not improving. Despite ample sunshine, the Middle East and Africa register the highest rates of rickets worldwide. Low levels of vitamin D are prevalent throughout the region, thus exposing people to the risk of osteoporosis later in life. In 2005, the US census bureau international data estimated that 1,827,242 people in a population of 125,750,356 has osteoporosis.

The National Osteoporosis Foundation (NOF) (2010) stated that the number of fractures resulting from osteoporosis is expected to double worldwide over the next 50 years. This projection is likely based on the expected increase in the elderly population. Still, the consequences are frightening. Osteoporosis has a high rate of disability, even mortality. Almost 25 percent of patients aged 50 or older who suffer hip fractures die as a result of medical complications within the year following the fracture.

Who is At Risk?

Recent studies reveal that heredity is a significant risk factor. When parents have a history of hip fracture, the risk of this type of fracture occurring in their children may even double. Another risk factor is malnutrition of a foetus, which results in lower bone density in childhood. Then there is the age factor. The older people get, the more fragile their bones generally become. Certain medical conditions, such as Cushing’s disease, diabetes, and hyperthyroidism, can also contribute to the development of osteoporosis (Davidson, 2012).

Menopause in women results in a reduction of oestrogens that protect bone mass. This is the reason why nearly four times more women suffer from osteoporosis than men. Oestrogen deficiency brought on by the surgical removal of a woman’s ovaries can result in early menopause.

Risk factors for osteoporosis that an individual can change include eating habits and lifestyle. A diet low in calcium and vitamin D is a contributing factor to bone deterioration. An excessive consumption of salt may increase risk, since it increases the body’s excretion of calcium. Excessive consumption of alcohol, which is often accompanied by poor nutrition, also contributes to bone loss.

An additional factor for developing osteoporosis is a lifestyle of limited physical activity. Smoking too is a significant risk factor, since it can decrease bone mineral density. According to the World Health Organization (2000) about 1 in 8 hip fractures is attributable to smoking. However, studies reveal that when a person stops smoking, bone loss and the risk of suffering a fracture decrease.

Symptoms and signs of osteoporosis

Osteoporosis can be present without any symptoms for decades because osteoporosis doesn't cause symptoms until bone fractures. Moreover, some osteoporotic fractures may escape detection for years when they do not cause symptoms. Therefore, patients may not be aware of their osteoporosis until they suffer a painful fracture. The symptom associated with osteoporotic fractures usually is pain; the location of the pain depends on the location of the fracture. The symptoms of osteoporosis in men are similar to the symptoms of osteoporosis in women (Catherine, 2006).

Fractures of the spine (vertebra) can cause severe "band-like" pain that radiates from the back to the sides of the body. Over the years, repeated spinal fractures can lead to chronic lower back pain as well as loss of height and/or curving of the spine due to collapse of the vertebrae. The collapse gives individuals a hunched-back appearance of the upper back, often called a "dowager hump" because it commonly is seen in elderly women.

A fracture that occurs during the course of normal activity is called a minimal trauma, or stress fracture. For example, some patients with osteoporosis develop stress fractures of the feet while walking or stepping off a curb. Hip fractures typically occur as a result of a fall. With osteoporosis, hip fractures can occur as a result of trivial slip-and-fall accidents. Hip fractures also may heal slowly or poorly after surgical repair because of poor healing of the bone.

Consequences of osteoporosis

Catherine (2006) stated that Osteoporotic bone fractures are responsible for considerable pain, decreased quality of life, lost workdays, and disability. Up to 30% of patients suffering a hip fracture will require long-term nursing-home care. Elderly patients can develop pneumonia and blood clots in the leg veins that can travel to the lungs (pulmonary embolism) due to prolonged bed rest after the hip fracture. Osteoporosis has even been linked with an increased risk of death. Some 20% of women with a hip fracture will die in the subsequent year as an indirect result of the fracture. In addition, once a person has experienced a spine fracture due to osteoporosis, he or she is at very high risk of suffering another such fracture in the near future (next few years). About 20% of postmenopausal women who experience a vertebral fracture will suffer a new vertebral fracture of bone in the following year.

How is osteoporosis diagnosed?

A routine X-ray can reveal osteoporosis of the bone because the bones appear much thinner and lighter than normal bones. Unfortunately, by the time X-rays can detect osteoporosis, at least 30% of the bone has already been lost. In addition, X-rays are not accurate indicators of bone density. Thus, the appearance of the bone on X-ray often is affected by variations in the degree of exposure of the X-ray film.

The National Osteoporosis Foundation, the American Medical Association, and other major medical organizations recommend a Dual-energy X-ray Absorptiometry scan (DXA, formerly known as DEXA) be used for the diagnosis of osteoporosis. DXA typically measures bone density in the hip, the spine, and the forearm. The test takes only five to 15 minutes to perform, exposes patients to very little radiation (less than one-tenth to one-hundredth of the amount used on a standard chest X-ray), and is quite precise.

The bone density of the patient is compared to the average peak bone density of young adults of the same sex and race. This score is called the "T score," and it expresses the bone density in terms of the number of standard deviations (SD) below peak young adult bone mass (Madho, Manyukwi, & Naidoo, 2012).

Prevention of Osteoporosis.

Research suggests that osteoporosis may be both preventable and treatable. A preventive measure is to see that the body has the proper amount of calcium along with vitamin D, which is essential for calcium absorption. Another preventive measure is regular weight-bearing exercise, such as walking or jogging.

The foundation for preventing osteoporosis is laid in childhood and adolescence. That is when 90 percent of a person's total bone mass is reached. Calcium, an essential nutrient for a strong skeletal structure, is stored primarily in the bones. Some of the principal sources of calcium are milk and dairy products, such as yogurt and cheese; canned sardines and salmon (eaten with the bones); almonds; oatmeal; sesame seeds; tofu; and dark-green leafy vegetables.

In order for calcium to be absorbed by the body, vitamin D is essential. This vitamin is synthesized in the skin by exposure to sunlight. Manuel Mirassou Ortega, a doctor of internal medicine and member of the Mexican Bone and Mineral Metabolism Association, explained: "Sunbathing for ten minutes a day contributes to preventing the development of osteoporosis, as it provides some 600 units of vitamin D." This vitamin can also be found in such foods as egg yolks, saltwater fish, and liver (Catherine, 2006).

The importance of exercise in preventing osteoporosis can hardly be overemphasized. During childhood and adolescence, exercise helps to increase bone mass, and in old age it helps to prevent loss of bone mass. Weight-bearing and resistance exercises—those in which muscles work against gravity or other forces without overstressing the bones and joints—are recommended the most. Walking, climbing stairs, and even dancing are simple but effective weight-bearing exercises. Physical activity can help to restore bone mass lost to osteoporosis (National Osteoporosis Foundation, 2010).

Prevention can certainly do much to combat this silent disease. This may include adjusting one's diet and lifestyle to preserve bone mass and to increase bone strength. It is true that for most people who have fallen into a sedentary lifestyle, such a way of life may be very difficult to change.

But what benefits come to those who make the effort to do so! Among other things, they may avoid being one of the many millions worldwide who suffer from osteoporosis. Another thing that will help to prevent osteoporosis is to prevent falls.

Extreme exercise, to the point of cessation of menstrual periods in women, can lead to brittle bones from oestrogen deficiency. It is recommended that women over 65 years of age have bone-density testing to determine the presence and severity of bone loss. If bone loss is severe, medicines may be available to prevent and treat osteoporosis. However, both risks and benefits should be considered before treatment is begun.

Carol (2008) stated that Postural correction and strengthening exercises should be prescribed—and we must be as particular about these prescriptions as we are about those for drugs. An ideal exercise program for an older osteoporotic patient can be easy to understand, simple to carry out, and safe.

Although osteoporosis cannot be cured, new medications for it are becoming available. Furthermore, it may be prevented by proper nutrition, adequate exercise, and for some, hormone replacement therapy. To be most effective, these measures must be undertaken before bone loss begins and must be continued for life (Pocock & Eisman, 1993).

Protection Against Osteoporosis.

Childhood and adolescence are particularly valuable times to improve bone mass through exercise, because exercise can help to prevent osteoporosis. The pulling and tugging on the bones by the muscles during exercise helps to stimulate bone-making cells and strengthens the bones. Regular weight-bearing exercise throughout life is best. This means exercise where the feet and legs bear the body's weight, such as brisk walking, aerobics, dancing, running, etc. For older people, a regular walk is a good start. However, the more vigorous the exercise, the better. It is most beneficial to exercise regularly - aiming for at least 30 minutes of moderate exercise or physical activity at least five times per week.

Muscle strengthening exercises are also important. They help to give strength to the supporting muscles around bones. This helps to increase tone, improve balance, etc, which may help to prevent a person from falling. Examples of muscle strengthening exercises include press-ups and weight lifting. Strengthening back muscles can reduce the risk of vertebral fractures and kyphosis (International Osteoporosis Foundation,2015).

Good nutrition that is rich in Calcium and vitamin D are important for bone health. The body needs adequate supplies of vitamin D in order to take up the calcium that is gotten from food or drink. The recommended daily intake for calcium in adults over the age of 50 is at least 1000 mg per day. Everyone aged over 50 years should also aim for adequate amounts of vitamin D daily (800 IU). 1000 mg of calcium can most easily be gotten by: Drinking a pint of milk a day (this can include semi-skimmed or skimmed milk); plus eating 50 g (2 oz) of hard cheese such as Cheddar or Edam, or one pot of yoghurt (125 g), or 50 g of sardines. Bread, calcium-fortified soya milk, some vegetables (curly kale, okra, spinach, and watercress) and some fruits (dried apricots, dried figs, and mixed peel) are also good sources of calcium. There are only a few foods that are a good source of vitamin D. Approximately 115 g (4 oz) of cooked salmon or cooked mackerel provide 400 IU of vitamin D. The same amount of vitamin D can also be obtained from 170 g (6 oz) of tuna fish or 80 g (3 oz) of sardines (both canned in oil). Vitamin D is mainly made by the body after exposure to the sun. The ultraviolet rays in sunshine trigger the skin to make vitamin D.

Moderate alcohol intake is not thought to be harmful to bone. However, chronic alcohol abuse is detrimental to bone health, with one of the mechanisms being a direct toxic effect on bone forming cells, also a lifestyle characterized by Non-smoking is beneficial for good bone health (Jose,2002).

Other things that can be done to prevent osteoporosis include eating green leafy vegetables and almonds also have very small amounts of calcium. Foods fortified with vitamin D include milk, orange juice, and some breakfast cereals. Check the amounts on the label carefully when you buy calcium and vitamin D fortified foods or drinks and supplements. The body also makes vitamin D when the skin is exposed to the sun. However, the amount of vitamin D the body can make is limited by several things such as sunscreen use, skin-color, where a person lives, and the amount of time spent outdoors (Fleming, 1992). Since most diets do not provide enough calcium and vitamin D, it is

best to take at least a 500 to 600 mg daily calcium supplement and a 1,000 IU daily vitamin D supplement. Low-fat dairy foods (milk, cheese, and yogurt) are good natural sources of calcium.

Complications of osteoporosis

The primary complication of osteoporosis is bone fracture. This may lead to no symptoms or be associated with severe, intractable pain. Recurrent fractures are common and can lead to deteriorating skeletal structure. Occasionally, fractures of the spinal vertebrae can push bone into adjacent nerves and/or spinal cord. This can require neurosurgical intervention. Osteoporotic vertebral fractures can also be relieved by vertebroplasty (kyphoplasty) procedures whereby the collapsed vertebra is inflated by a balloon and cement (methylmethacrylate) is injected to reform structure to the vertebra. Repeated vertebral compression fractures can lead to severe deformity of the spine of the chest (kyphosis) that can compromise breathing along with cause extreme loss of height. This can increase the risk of problems with any respiratory infections (William, 2006).

Some Osteoporosis Risk Factors

Hereditary factors.

Having a strong family history of osteoporosis (that is, a mother, father, sister or brother affected). If a person have a body mass index (BMI) of 21 or less (that is, very underweight, weighing less than 127 pounds) - for example, if the individual have anorexia nervosa. In this situation, the body's levels of oestrogen are often low for long periods of time and, combined with a poor diet, this can affect bones. Being a woman and experiencing periods stop for six months to a year or more before the time of menopause. This can happen for various reasons. For example, over-exercising or over-dieting. Slender, being smallish (five feet two inches [157cm] or less).

Life-Style factors.

A lifestyle that is characterized by very reduced outdoor sunlight, less than three hours a week, low calcium intake, high caffeine and/or phosphate intake and Alcoholism (Eisman, 1994).

Medically related factors.

If an individual have taken, or is taking, a steroid medicine (such as prednisolone) for three months or more. A side-effect of steroids is to cause bone loss. For example, long-term courses of steroids are sometimes needed to control arthritis or certain other conditions. Use Antacids containing aluminium, Thyroid or levothyroxine, Dilantin (prolonged treatment) and Furosemide (diuretic). Early or premature menopause, the removal of the ovaries at a young age (under 45years), hormone abnormalities such as over-activities of the thyroid gland or glands that produces the body's natural steroids or under production of testosterone in men, chronic liver or kidney disease and vitamin D deficiency. Amenorrhea (absence of menses), Anorexia nervosa, Hyperthyroidism (excessive thyroid), Diabetes, Lactase deficiency (milk intolerance), Bed rest or immobilization longer than three weeks, Rheumatoid arthritis, having a fracture after the age of 50 due to "brittle" bones and Having a history of falls in the past 12 months (Fleming, 1992).

Implications for Health Education.

The foregoing discussion has some important implications for health education. It is however important to note that there is no specific statistics of the number of people who are suffering from the burden of osteoporosis in Nigeria. Thus, in view of that, health education should be made available to everyone in Nigeria. The health education should focus on proper diet that is rich in calcium and vitamin D. Pocock and Eisman (1993) opined that osteoporosis may be prevented by proper nutrition. Since bone formation starts in early childhood and bone reaches its maximum strength and size at early adulthood, it is suggested that this health education also starts during childhood by including osteoporosis as a topic in the already existing health education syllabus and curriculum used in primary schools, so as to expose the silent killer early enough and what could be done to prevent osteoporosis from occurring later in life.

Another aspect of health education that should be provided is lifestyle modification to a healthy lifestyle that will adopt regular moderate exercise. William (2006) revealed that exercise can be combined with medications and other therapies, physical therapy can help improve bone strength,

posture, muscle strength and balance--and make falls less likely. Exercise also reduces risk of falling. Some of the strategies that could be employed to bring regular exercise is to invigorate the periods mapped out in schools for physical activities and make it a daily affair, these activities should not only be geared towards winning competitions alone but also to maintain the physical fitness of the students at all levels of learning (primary, secondary and tertiary). Avoidance of smoking and consumption of very little alcohol. Consumption of more than two alcoholic drinks a day may decrease bone formation and reduce calcium absorption.

Also, health education that is focused on safety education is appropriate, educating people to reduce the risk of falls and broken bones in the home. This can start by checking for and removing hazards such as electrical cords, area rugs and slippery surfaces that might cause trips or falls. Also, improve lighting around the home and outside areas such as pathways or sidewalks. Within the home, it is important to have specific locations where each item in the home is kept, so that things are not thrown here and there, thereby blocking ways and causing falls.

Conclusion

Osteoporosis is a condition in which the amount of bone tissue is so low that the bones easily fracture in response to minimal force. A person with osteoporosis can fracture a wrist or hip from a fall on the ice or receive a broken rib from an affectionate hug, it is also called the brittle bone disease. In fact, the amount of bone tissue may be so low that a person fractures the spine simply by carrying the weight of the body. Osteoporosis is a bone condition characterized by low bone density and deterioration of bone strength, leading to bone fragility and susceptibility to fracture. It can be diagnosed by means of a low radiation scan, which measures bone mineral density.

Recommendations

From the foregoing discussion, the following recommendations are made:

1. Individuals and those at risk of osteoporosis should always eat foods rich in calcium and vitamin D. the body needs adequate supply of vitamin D to be able to absorb the calcium that is eaten in food and drinks. Calcium is needed for strong and healthy bones all through life.
2. Engage in physical activities such as weight-bearing and resistance exercises—those in which muscles work against gravity or other forces without overstressing the bones and joints. Walking, climbing stairs, and even dancing are simple but effective weight-bearing exercises. Exercise can help to prevent osteoporosis. The pulling and tugging on the bones by the muscles during exercise helps to stimulate bone-making cells and strengthens the bones. Regular weight-bearing exercise throughout life is best; it is never too late to start. Start now.
3. Healthy lifestyle that is devoid of alcoholism. Chemicals from tobacco can get into the bloodstream and can affect the bones, making bone loss worse. If you smoke, you should try to make every effort to stop. Also, you should try to cut down on your alcohol intake if you drink more than three units of alcohol daily
4. Efforts should be made to make the home environment to be safe, well arranged without sticks and other objects obstructing movement and causing falls. All items in the home should be kept at specific places and those locations should be maintained, when they are removed, they should be returned at same place. So that they are not thrown here and there.

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