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Osteoporosis

Osteoporosis is a metabolic bone disorder in which the rate of bone reabsorption accelerates and the rate of bone formation decelerates, resulting in a decrease in bone mass. The bones affected by osteoporosis lose calcium and phosphate and become brittle and abnormally prone to fractures (Marieb, 2010). Osteoporosis can be a primary disorder, occurring alone, or it can occur secondary to another disease process. The cause of primary osteoporosis is unknown, but some of the factors that are believed to contribute to the cause of the disease are a mild prolonged lack of calcium related to poor dietary intake, hormonal imbalance related to endocrine deficiency, poor metabolism of protein related to low estrogen, and a sedentary life style (Marieb, 2010). The cause of secondary osteoporosis is often the result of another disease such as alcoholism, malnutrition, liver disease, scurvy, lactose intolerance, hyperthyroidism, and rheumatoid arthritis (Marieb, 2010).

There are many risk factors that are associated with developing osteoporosis. The major risk factors include being female, being over the age of 60 for females and over 75 for males, postmenopausal estrogen deficiency, a family history of osteoporosis, a thin, lean body build, a history of smoking and high alcohol intake, and a lack of physical activity or prolonged immobility (Marieb, 2010). Osteoporosis is diagnosed based on a combinations of the symptoms the person is experiencing along with diagnostic procedures. The symptoms that are often experienced by someone with osteoporosis include reduced height, sudden pain after lifting and bending that is made worse with activity and better with rest, restriction with movement and a history of fractures (Lippincott, 2006). Some of the other symptoms associated with osteoporosis

1 are kyphosis, or “hunch back”, which is caused by micro fractures that cause a curvature of the
2 upper spine and pain when the affected area is touched, or palpated (Lippincott, 2006).

3 The laboratory tests that are commonly used to reach a diagnosis of osteoporosis are
4 serum calcium, vitamin D, phosphorus and alkaline phosphatase levels. These blood tests are
5 done to monitor the levels and are used to rule out other disorders that can have similar
6 symptoms such as Paget’s disease and osteomalacia (Lippincott, 2006). The common diagnostic
7 procedures done to diagnose osteoporosis include radiographs, dual energy x-ray absorptiometry
8 (DEXA), and quantitative ultrasound (QUS). Radiographs are done of the spine and the long
9 bones, such as the femur, to reveal low bone density and to see if there are any fractures. Dual
10 energy x-ray absorptiometry (DEXA) is used to screen for early changes in bone density. It is a
11 painless test that measures bone density in the wrist, hip and spine. Quantitative ultrasound
12 (QUS) is an ultrasound that is usually done of the heel, and is used to assess for the risk of
13 fracture. This is done by looking at the bones in the heel that are very important in weight
14 bearing, and assessing if there are any fractures. QUS is commonly used because it is
15 inexpensive, portable, and a low-risk method to determine osteoporosis (Lippincott, 2006).

16 While there is no cure for osteoporosis, there are several medications that can be used to
17 help slow the process of the disease. One of the classifications of medication that can be used to
18 help prevent secondary osteoporosis related to estrogen deficiency is estrogen hormone
19 supplement. Hormone supplements replace the estrogen lost because of menopause (Davis,
20 2011). Another medication that is used is Evista, it is a selective estrogen receptor modulator
21 that decreases osteoclast activity which decreases bone reabsorption (Davis, 2011). Fosamax,
22 Boniva, and Actonel are part of a class of drugs called Bisphosphonates. These drugs work to
23 decrease the number and action of osteoclasts which inhibits the bone reabsorption (Davis,

1 2011). Calcium supplements, such as Os-Cal and Citrical, are used in the prevention as well as
2 the treatment. They are used to supplement the dietary intake of calcium from food products
3 (Davis, 2011). Vitamin D supplements are used along with Calcium supplements, the increase
4 the absorption of calcium in the intestinal tract. Vitamin D is needed by individuals who are not
5 exposed to enough sunlight or do not meet the daily requirements (Davis, 2011).

6 If left untreated osteoporosis can cause major damage on the skeletal system. Because of
7 a loss of bone density the bones become brittle and can fracture easily. This can become a major
8 issue in the population that osteoporosis affects, post-menopausal women over 60. Because of
9 the advanced age of the individuals affected by osteoporosis, they also have issues with
10 increased risk of falls related to things such as gait changes, impaired balance, vision and hearing
11 loss and generalized weakness (. This puts the individual at a much higher risk for fractures of
12 bones such as the hip and femur if they were to fall. Another change that osteoporosis has on the
13 skeletal system is the development of kyphosis, commonly referred to as hump back (dowager's
14 hump). This is usually reported as a slow loss of height and a curvature of the spine that worsens
15 over time because of the repeated vertebral fractures that are occurring (Lippincott, 2006). As
16 kyphosis worsens, it can cause the abdomen to protrude to compensate for the change in the
17 center of gravity. Also individuals often report exercise intolerance and trouble breathing, and
18 they also may experience muscle spasm and decreased spinal movement and discomfort
19 (Lippincott, 2006).

20 Although osteoporosis cannot be cured, there are many ways that individuals affected can
21 manage the disease and lead normal lives. Individuals with osteoporosis work together with
22 their primary care doctors to develop a program to help maintain bone integrity and hopefully
23 increase bone density. These programs often include physical therapy or a gentle exercise

1 program along with drug therapy, these care programs aim at controlling bone loss, preventing
2 fractures, and controlling pain. If fractures do occur surgery may be necessary to correct the
3 fracture, along with the used of supportive devices, such as back braces (Lippincott, 2006).

4 Along with exercises programs individuals should eat a balanced diet that is rich in nutrients
5 high in vitamin D, calcium, and protein to support a healthy skeletal metabolism (Lippincott,
6 2006).

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