

News from the Minority Health Affairs Committee

OSTEOPOROSIS: DISPARITIES OF PREVENTION, DIAGNOSIS AND TREATMENT

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Currently, the cost of health care is of major concern to most adult Americans. Osteoporosis, a disorder characterized by low bone mass with microarchitectural disruption of bone tissue, which leads to enhanced bone fragility and increased fracture risk, is the most common and the most costly bone disease in the United States. It occurs in all ages and ethnic groups (1). Its hallmark is low impact fractures (“fragility fractures”) with normally mineralized bone, normal serum calcium and phosphorous. Although most morbidity and mortality is associated with hip fractures, fractures of the spine, wrists, and ankles are common and very costly. Low bone mass is a major health threat for more than 44 million Americans (including 55% of those ≥ 50 yrs of age) and is estimated to cost more than \$19 billion annually (2,3). In the United States, 10 million people already have osteoporosis and 34 million have such low bone mass that they are at risk for developing osteoporosis. Both the prevalence and the cost are underestimated because osteoporosis is often unrecognized, undiagnosed and untreated in Americans. In many non-Caucasian ethnic groups, the failure to recognize, diagnose, and treat low bone mass is monumental. Data on these groups is incomplete and often estimated (4).

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Hispanic African American men, but the low bone mass estimate is 19%; 10% of Hispanic women, but low bone mass estimate is 49%; and 3% of Hispanic men, but the low bone mass estimate is 23%. When compared to other groups, the risk of osteoporosis and the cost of care are increasing more rapidly in Hispanic women. Costs for care of Hispanic osteoporotic fractures are estimated to increase from \$754 million per year in 2005 to \$2 billion per year in 2025 (5).

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Osteoporosis is a preventable problem. If prevention fails, early diagnosis and appropriate therapy can decrease the cost of care by preventing the marked morbidity associated with disabling fractures. More American women die annually of hip fractures than from heart disease, stroke, breast cancer, uterine cancer, or ovarian cancer. An unfortunate example of this is that the highest rate of morbidity and mortality from osteoporotic fractures occurs in African American women. The reason remains unclear; however, it is known that with the exception of Native Americans, when compared to other ethnic groups, African Americans have the lowest vitamin D levels in childhood and in their adult years (2).

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Since osteoporosis is predominantly a disease diagnosed in the elderly, as the population ages, the costs of care will continue to increase. It is estimated that by 2025 the costs for care for this preventable disease will increase to \$25.3 billion per year. Unfortunately, as with other chronic diseases in ethnic groups, disparities of prevention, diagnosis, and therapy for osteoporosis persists. When these clinical disparities persist and are combined with the health care burden of complications from other diseases, the costs of care continue to increase for many ethnic groups in the United States (3,5,6).

Bone mass is an indicator of bone strength. Bone strength is based on both bone density and quality. According to The World Health Organization (WHO), bone mineral density (BMD), as determined by dual-energy X-ray absorptiometry, should be used to diagnose osteoporosis (7). A BMD that is 2.5 standard deviations (SD) or more below the average peak bone mass for a healthy young adult reference population is defined as osteoporosis. It is expressed as a T-score of -2.5 or less (the normal T-score = 1 SD or more). Low bone mass (or osteopenia) is from -1 to -2.5 SD, and indicates an increased risk for osteoporosis. T-scores between -1 and -2.5 are associated with 50% of the osteoporotic fractures in women (8). Also, for every one SD decrease in BMD at the hip, the risk of hip fracture doubles (2.6 fold increase) (9). BMD is thus inadequate as a lone tool to assess the risk of fracture. In 2008, WHO introduced a Fracture Risk Assessment Tool (FRAX), which estimates the 10-year probability of hip

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fracture for untreated patients between the ages of 40 to 90, using the femoral neck BMD and the following risk factors: advanced age, prior fracture, long-term glucocorticoid therapy, low body weight, family history of hip fracture, cigarette smoking, and excess alcohol intake. FRAX was validated in 11 independent cohorts, including men and women of different ethnicities from different countries (it is country specific) and can be accessed with the calculation tool on the website: www.shef.ac.uk/FRAX/ (10). This is an excellent tool for assessing fracture probability in both Caucasians and non-Caucasians.

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PREVENTION

Osteoporosis is a preventable problem. After peak bone mass is achieved in the early thirties, bone tissue destruction is irreversible, thus prevention of bone mass lost is essential. More American

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Osteoporosis Disparities

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women die annually of hip fractures than from heart disease, stroke, breast cancer, uterine cancer, or ovarian cancer; an unfortunate example of this is that the highest rate of morbidity and mortality from osteoporotic fractures occurs in African American women. The reason remains unclear; however, it is known that with the exception of Native Americans, when compared to other ethnic groups, African Americans have lower calcium and vitamin D levels in childhood and in their adult years (2). Dark pigment prevents absorption of the UV rays that are needed for producing vitamin D in the skin. Also, the high rate of obesity in many ethnic groups may inhibit prevention because obesity reduces the bioavailability of vitamin D and limits the weight bearing exercises needed to achieve the peak bone mass. Calcium intake may also be limited because many groups do not eat large amounts of foods with a high calcium content. For many African Americans, a lactase deficiency is evident in childhood, thus, during the years when they should be building their peak bone mass, they avoid high calcium foods (12).

DIAGNOSIS

Women in non-Caucasian ethnic groups are not offered fracture risk screening and BMD studies as often as Cauca-

sian women. Frequently, they are not even diagnosed after being treated for fragility fractures (5, 13). The medical community's lack of awareness is often echoed by the patient and the community from which the patient comes. For the uninsured in many areas, the patient's primary source of health care is an emergency care center where time and financial constraints permit very little osteoporosis awareness education.

THERAPY

Current preferred drug choices for osteoporosis are bisphosphonates, selective estrogen receptor modulators (SERMs), parathyroid hormone, or calcitonin. Bisphosphonates are recommended as first line therapy; however, in the United States, African American and Hispanic women ages 45 and older use fewer antiresorptive and SERMs than Caucasian women (14,15). These therapies may be too costly for the uninsured, and thus, of limited availability for many members of minority populations. In addition, these recommended drug therapies are not prescribed for members of non-Caucasian ethnic groups as frequently as they are for Caucasians.

SUMMARY

In the United States, disparity of therapy for many ethnical groups determines whether

osteoporosis, a costly, major health problem, will be prevented, diagnosed and treated appropriately. Awareness education of both the medical and nonmedical communities may help to decrease the cost associated with the morbidity and mortality caused by this disparity of care.

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