

A Closer look at Osteoporosis and Its Epidemiology

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DESCRIPTION

Osteoporosis is a skeletal condition characterized by reduced bone mass and micro degradation of bone tissue, resulting in lower bone tension and strength and an increased risk of fragility fracture. Osteoporosis is a huge threat to the world's old population, which is rapidly expanding, and the risk of fracture grows as the population ages.

The capacity of bone to endure damage is influenced by bone geometry, microarchitecture, and size. However, bone mineral density contributes for 75%-90% of the variation in bone strength (BMD). Bone strength results from the combination of bone density and bone quality. The World Health Organization has established standards for assessing bone health, including the T-score and the score. The T-score is defined as the number of SDs below the young adult mean value in osteoporosis (the World Health Organization defines osteoporosis as a T-score of 2.5), and the z score is the expected BMD for the individual's age and gender. BMD is calculated as a correlation between the T-score and the z score.

EPIDEMIOLOGY

Every year, osteoporosis causes more than 8.9 million fractures worldwide, with Europe having the highest number of osteoporotic fractures (34.8%). Osteoporotic fracture is the most dangerous clinical outcome of osteoporosis. Fractures of the hip, vertebrae, and distal forearm are regarded osteoporotic fractures with shared epidemiologic characteristics: fracture incidence is greater in women than men, increases rapidly with age, and occurs in parts of body with a high proportion of trabecular bone. Furthermore, osteoporosis might result in fractures in other places. These include humerus, rib, tibia (in women), and pelvic femoral fractures.

Ethnicity and gender are major variables determining osteoporosis prevalence. Older Asian men are said to be half as likely as Caucasian men to experience a hip fracture throughout their lifetime. Asian women, like males, have a reduced fracture risk than Caucasian women. Furthermore, there are ethnic and racial disparities in pharmacological treatment response for osteoporosis. A research of diverse populations found that BMD is greater in African American women than in white women at all body weight levels, which is consistent with their reduced fracture rates. In Asia, the prevalence of both lifestyle-related metabolic diseases and osteoporosis is rising. In Asian males, metabolic syndrome may be related with bone loss, and atherosclerosis is connected with higher risk of bone loss.

Impact of glucocorticoids on bone

Synthetic glucocorticoids are used to treat autoimmune, pulmonary, and gastrointestinal problems, as well as patients undergoing organ transplantation and those suffering from cancer. Glucocorticoids have a significant impact on the skeleton, and the most prevalent secondary cause of osteoporosis is glucocorticoid-induced osteoporosis. Glucocorticoids cause biphasic bone loss, with a rapid early phase of 10%-20% bone loss in as little as 3 months of medication and a later period of 2%-5% bone loss annually. They boost the expression of the Receptor Activator for Nuclear factor- κ B Ligand (RANKL) while decreasing the expression of its soluble receptor antagonist, Osteoprotegerin (OPG), in stromal and osteoblastic cells, resulting in increased bone resorption. Glucocorticoids inhibit the transcription of the IGF-I gene, which is crucial for bone growth and the production of type I collagen.

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