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Osteoporosis chronic pain

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Osteoporosis (OP) is a silent disease unless a fracture occurs; it is a major health problem, mainly due to fragility fractures, that occur at vertebral and peripheral sites. Vertebral osteoporosis is markedly underdiagnosed. Approximately 200 million people in the world are affected by osteoporosis and 8.9 million fractures occur each year worldwide. Worldwide estimates predict 2 billion people will be over 65 years old by 2050, increasing this third millennium pandemic. Mechanisms of pain in osteoporosis are poorly known, though several studies show that osteoclasts play a significant role in bone pain etiology. Most common manifestations of osteoporosis are vertebral compression fractures that cause persistent pain. First manifestation could be an acute pain due to pathological fracture. Pain in osteoporosis is mainly nociceptive if it becomes persistent. Sensitization of peripheral and central nervous system can occur, so underlining the transition to a chronic pain syndrome. Decrease of pH in the bone always happens during osteoclasts hyperactivity. Both of the two acid-sensing ion channels expressed by nociceptors (TRPV1 and ASIC-3) are excited and sensitized by a decrease in pH. It is demonstrated that bone mass decline with age whereas density of sensory nerve fibers in the tissue do not decline in older age. Moreover, during pathological processes of bone, sensory nerve fibers undergo pathological modifications. All these factors contribute to generate and maintain pain and osteoclasts play an important role in pain through activation of the acid-sensing receptors including ASICs and TRPV1 by creating acidosis. Over time, multiple fractures may lead to progressive loss of stature and continuous contraction of the paraspinal musculature to maintain posture. Literature is unanimous in supporting the role of physical exercise in the prevention of chronic pain of osteoporotic origin; in particular, there is strong evidence for a beneficial effect of exercise on the pathogenesis of osteoporosis.

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