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Comprehensive therapy in osteoporosis using a single drug: from ADFR to strontium ranelate.

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Abstract

In vitro, strontium ranelate increases collagen and non-collagenic proteins synthesis by mature osteoblast enriched cells. The effects of strontium ranelate on bone formation were confirmed as the drug enhanced preosteoblastic cell replication. In the isolated rat osteoclast, a preincubation of bone slices with strontium ranelate induced a dose-dependent inhibition of the bone resorbing activity of treated rat osteoclast. Strontium ranelate dose-dependently inhibited preosteoclast differentiation. In a phase II dose ranging trial Strontium ranelate (500 mg, 1000 mg, 2000 mg/day) or placebo were given to 353 postmenopausal women with prevalent vertebral osteoporosis. At the conclusion of this 2-year study, the annual increase in lumbar BMD of the group receiving 2000 mg of strontium ranelate was + 7.3%, a significant increase in bone alkaline phosphatase, over a 6-month period and a significant decrease in N-telopeptide crosslinks throughout the 2-year period were seen. During the second year of treatment, the dose of 2000 mg was associated with a 44% reduction in the number of patients experiencing a new vertebral deformity. The primary analysis of the SOTI study, evaluating the effect of strontium ranelate 2000 mg on vertebral fracture rates, revealed a 41% reduction in the relative risk of patient experiencing a first new vertebral fracture with strontium ranelate throughout the 3-year study. The TROPOS study showed a significant reduction in the risk of experiencing a first non-vertebral fracture by 16% in the group treated with strontium ranelate throughout the 3-year study. A reduction in the risk of experiencing a hip fracture by 36% was also demonstrated in the patients at high risk of hip fracture (age > or =74 years and Femoral Neck T score < or = -2.4 according to NHANES normative value). All these results suggest that strontium ranelate is a new, effective and safe treatment of vertebral and non-vertebral osteoporosis, with a unique mode of action.

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