

## ***Magnesium deficiency and osteoporosis: animal and human observations***

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Rude RK1, Gruber HE.

Author information:

1University of Southern California and The Orthopaedic Hospital, Los Angeles, CA 90089-9317, USA.

rrude60075@aol.com

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### **Abstract**

Although osteoporosis is a major health concern for our growing population of the elderly, there continues to be a need for well-designed clinical and animal studies on the link between dietary magnesium (Mg) intake and osteoporosis. Relatively few animal studies have assessed the skeletal and hormonal impact of long-term low Mg intake; however, these studies have demonstrated that Mg deficiency results in bone loss. Potential mechanisms include a substance P-induced release of inflammatory cytokines as well as impaired production of parathyroid hormone and 1,25-dihydroxyvitamin D. Abnormal mineralization of bones may also contribute to skeletal fragility. Clinical studies have often varied greatly in study design, subject age, menopausal status and outcome variables that were assessed. Most studies focused on female subjects, thus pointing to the great need for studies on aging males. According to the U.S. Department of Agriculture, the mean Mg intake for males and females is 323 and 228 mg/day, respectively. These intake levels suggest that a substantial number of people may be at risk for Mg deficiency, especially if concomitant disorders and/or medications place the individual at further risk for Mg depletion. In this paper, we will review animal and human evidence of the association of Mg deficiency with osteoporosis and explore possible mechanisms by which this may occur.