

OSTEOSCOOP

News on current events in osteoporosis and rheumatology

Bone remodeling during lactation and weaning

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A significant portion of milk calcium comes from the mother's skeleton, and lactation is characterized by rapid bone loss. The most remarkable aspect of this bone loss is its complete reversibility, and the time following weaning is the most rapid period of skeletal anabolism in adults. Despite this, little is known of the mechanisms by which the skeleton repairs itself after lactation. In a recent study [1], the authors examined changes in bone and calcium metabolism defining the transition from bone loss to bone recovery at weaning in mice. Bone mass decreases during lactation and recovers rapidly after weaning. Lactation causes changes in bone microarchitecture, including thinning and perforation of trabecular plates that are quickly repaired after weaning. Weaning causes a rapid decline in urinary markers of resorption such as collagen C-telopeptide levels and stimulates an increase in circulating levels of osteocalcin, a marker of bone formation. Bone histomorphometry documented a significant reduction in the numbers of osteoclasts on day 3 after weaning caused by a coordinated wave of osteoclast apoptosis beginning 48 hours after pup removal. In contrast, osteoblast numbers and bone formation rates, which are elevated during lactation, remain so 3 days after weaning. The cessation of lactation stimulates a rise in circulating calcium levels and a reciprocal drop in parathyroid hormone levels. Finally, weaning is associated with a decrease in levels of RANKL mRNA in bone.

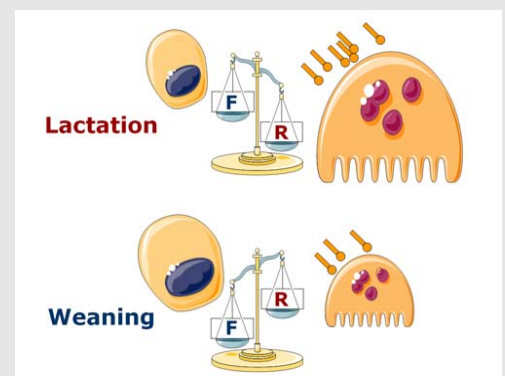
This study shows that, during lactation, bone turnover is elevated and bone loss is rapid. Weaning causes selective apoptosis of osteoclasts halting bone resorption. The sudden shift in bone turnover favouring bone formation subsequently contributes to the rapid recovery of bone mass.

1. Ardeshirpour L et al. *Endocrinology*. May 10, 2007, doi:10.1210/en.2006-1467.

Bone remodeling during lactation and weaning

During lactation, bone loss is related to increased resorption which releases calcium contained in milk.

Recovery of bone mass after weaning is due to decreased resorption because of osteoclast apoptosis and decreased secretion of RANKL.



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