Effects of Lactobacillus helveticus fermented milk on bone cells in vitro.

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Abstract
Milk fermented with Lactobacillus helveticus (L. helveticus) contains small peptides such as isoleucyl-prolyl-proline (IPP) and valyl-prolyl-proline (VPP), which inhibit the angiotensin converting enzyme (ACE). We investigated the effects of L. helveticus fermented milk whey (Lh-whey) and its components, sour milk whey, calcium and IPP and VPP peptides, on bone cells in vitro. An osteoblast assay was performed by determining the amount of deposited calcium as an index of bone formation in cultures of mouse osteoblasts formed from bone marrow-derived osteoblast precursor cells. An osteoclast assay was performed by determining the activity of tartrate-resistant acid phosphatase released into the culture medium in cultures of mouse osteoclasts formed from bone marrow-derived osteoclast precursor cells. The Lh-whey increased bone formation 1.3-1.4 times with the 1 x 10(-5), 1 x 10(-4) and 1 x 10(-3) solutions. The IPP and VPP peptides also demonstrated a significant 5-fold activation of bone formation in vitro osteoblast cultures, whereas the sour milk whey and calcium had no effect. No significant effects were observed on osteoclasts in vitro with any of the study products. L. helveticus fermented milk whey contains bioactive components that increase osteoblastic bone formation in vitro. The effect may be due to the ACE-inhibitory IPP and VPP peptides, which showed a similar effect to that of the L. helveticus fermented milk whey.

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