

# Abstract

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## Changes in bone mineral status and bone size during pregnancy and the influences of body weight and calcium intake.

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**BACKGROUND:** Calcium may be mobilized from the maternal skeleton during pregnancy, which may be influenced by several factors.

**OBJECTIVE:** The objective was to investigate changes in bone mineral status and size during pregnancy and to consider the influences of body weight and calcium intake.

**DESIGN:** Thirty-four British women were studied before pregnancy and 2 wk postpartum (Preg). Eighty-four nonpregnant, nonlactating (NPNL) women were studied over a corresponding time. Bone mineral content (BMC), bone area (BA), areal bone mineral density (aBMD), and BA-adjusted BMC of the whole-body, lumbar spine, radius, and hip were measured by dual-energy X-ray absorptiometry.

**RESULTS:** The Preg group experienced significant decreases in BMC, aBMD, and BA-adjusted BMC at the whole-body, spine, and total hip of between 1% and 4%. Whole-body BMC increased in the NPNL group, and aBMD and BA-adjusted BMC decreased at the spine and hip by 0.5% to 1%. Whole-body BMC decreased in the Preg group by  $-2.16 \pm 0.46\%$ , equivalent to  $-2.71 \pm 0.43\%$  relative to the NPNL group ( $P < 0.001$ ). Weight change was a positive predictor of skeletal change at the spine, hip, and radius in both groups. Differences between the Preg and NPNL groups in change in BA-adjusted BMC, after correction for weight change and other influences, were as follows ( $P < 0.01$ ): whole-body,  $-1.70 \pm 0.25\%$ ; spine,  $-3.03 \pm 0.72\%$ ; and total hip,  $-1.87 \pm 0.60\%$ . Calcium intake was not a significant predictor of skeletal change in either group.

**CONCLUSIONS:** Pregnancy is associated with decreases in whole-body and regional bone mineral status sufficient to make a sizeable contribution to maternal and fetal calcium economy. Calcium intake is not a significant predictor of the skeletal response to pregnancy in well-nourished women.

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