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

Olausson H, Laskey MA, Goldberg GR, Prentice A.
MRC Human Nutrition Research, Elsie Widdowson Laboratory, Cambridge, UK.

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 +/- 0.46%, equivalent to -2.71 +/- 0.43% relative to the NPNL group (P < or = 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 < or = 0.01): whole-body, -1.70 +/- 0.25%; spine, -3.03 +/- 0.72%; and total hip, -1.87 +/- 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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