Abstract

Calcium metabolism of the mother is modified during pregnancy because of the mineralization of the fetus skeleton. Objective. To evaluate the association of calcium intake and bone demineralization during pregnancy. Material and Methods. At each trimester of pregnancy a validated food frequency intake questionnaire was administered to assess individual daily calcium intake in a cohort of 206 pregnant women, residents of Mexico City. Samples of urine were collected to measure levels of the cross-linked N-telopeptide of type I collagen (NTx), which is a biomarker of bone resorption. The association between calcium ingestion and bone resorption was analyzed using random effects models; non-linear associations were explored using generalized additive models. Results. Progressive increases in NTx levels were observed during pregnancy; with mean and standard deviation (SD) values during the first, second and third trimester of 76.50 (SD=38), 101.02 (SD=48.86) and 144.83 (SD=61.33) nmol BCE/mmol creatinine, respectively. Higher dietary calcium intake was associated with lower bone resorption (b=-0.015; p<0.05). The association between age and NTx showed a non-linear trend with an inflexion point around 33 years: increase in maternal age below that point was associated with a decrease in bone resorption, while in older women the increase in age was associated with an increased resorption. Conclusions. Our results suggest that calcium ingestion, specifically from dairy products, reduces bone resorption during pregnancy. For each 300mg (a glass of milk) of calcium intake there is an estimated reduction in NTx level of 4.8 nmol BCE/mmol of creatinine (p<0.05).

Keywords

Pregnancy, bone resorption, N-telopeptides, calcium intake, longitudinal study, dairy products.