

Calcium during pregnancy reduces harmful blood lead levels

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Pregnant women who take high levels of daily calcium supplements show a marked reduction in lead levels in their blood, suggesting calcium could play a critical role in reducing fetal and infant exposure.

A new study at the University of Michigan shows that women who take 1,200 milligrams of calcium daily have up to a 31 percent reduction in lead levels.

Women who used lead-glazed ceramics and those with high bone lead levels showed the largest reductions; the average reduction was about 11 percent, said Howard Hu, chair of the Department of Environmental Health Sciences at the School of Public Health.

Hu is the principal investigator of the study and one of the senior authors on the paper, which is available online in *Environmental Health Perspectives*, the official journal of the U.S. National Institute for Environmental Health Sciences. Hu, who is also affiliated with the University of Michigan School of Medicine, said this is the first known randomized study examining calcium supplementation on lead levels in pregnant women.

"We and others have previously shown that during pregnancy, mothers can transfer lead from their bones to their unborn -- with significant adverse consequences--making maternal bone lead stores a threat even if current environmental lead exposures are low," Hu said. "This study demonstrates that dietary calcium supplementation during pregnancy

may constitute a low-cost and low-risk approach for reducing this threat."

Lead exposure is a great concern for pregnant and lactating women, especially in developing countries where lead exposures have been high until recently, and for women with occupational exposure. Developing fetuses and nursing babies are exposed to lead from either current exposures to mothers or from the mobilization of maternal skeletal lead stores accumulated from prior years of exposure. Bone lead can stay in the body for decades, so even with minimal environmental exposure, the fetus or nursing infant can still be at great risk from maternal stores of lead.

Lead exposure during fetal development and infancy can cause low birth weight or slow weight gain after birth, cognitive defects such as lower intelligence scores, lower motor and visual skills, or even miscarriage. Damage from lead exposure and poisoning is usually permanent.

"The bottom line is that obstetricians and pediatricians should consider adding calcium supplementation to the prenatal vitamins normally recommended in pregnant women, particularly if their patients have a significant history of environmental or occupational lead exposure," Hu said.

The study showed that reductions in blood lead levels were more evident in the second trimester at 14 percent than in the third trimester at 8 percent. The most compliant group of women in the study (those who consumed greater than 75 percent of the assigned 1,200 milligram doses of calcium per day) showed a 24 percent decrease. Women in the most compliant group who also reported using lead glazed ceramics and had the highest bone lead levels saw the greatest reduction of 31 percent.

Researchers analyzed 557 women recruited from the Mexican Social

Security Institute prenatal clinics, which treat the low to moderate income population of Mexico City. All were in their first trimester; roughly half were assigned calcium and half a placebo.

This recent study corresponds with a previous study performed by the same group of investigators showing that 1,200-milligram daily calcium supplementation during lactation reduced maternal blood lead by 15-20 percent, and breast milk lead by 5-10 percent. This is the first randomized trial to evaluate the effect of supplementation during pregnancy, when lead is more easily transferred to the fetus, Hu said.

Source: University of Michigan

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