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Lead Content of Calcium Supplements

Edward A. Ross, MD; Nancy J. Szabo, PhD; Ian R. Tebbett, PhD

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Context Substantial quantities of lead have been reported in some over-the-counter calcium supplement preparations, including not only bonemeal and dolomite, but also over-the-counter natural and refined calcium carbonate formulations. Examination of this issue is warranted given recent increases in physician recommendations for calcium supplements for prevention and treatment of osteoporosis.

Objectives To determine the lead content of calcium supplements and to quantify the lead exposure from popular brands of calcium in dosages used for childhood recommended daily allowance, osteoporosis, and phosphate binding in dialysis patients.

Design and Setting Analysis of lead content in 21 formulations of nonprescription calcium carbonate (including 7 natural [ie, oyster shell] and 14 refined), 1 brand of prescription-only calcium acetate, and 1 noncalcium synthetic phosphate binder conducted in March 2000.

Main Outcome Measures Lead content, assayed using electrothermal atomic absorption, expressed as micrograms of lead per 800 mg/d of elemental calcium, per 1500 mg/d of calcium, and for a range of dosages for patients with renal failure. Six $\mu\text{g}/\text{d}$ of lead was considered the absolute dietary limit, with no more than 1 $\mu\text{g}/\text{d}$ being the goal for supplements.

Results Four of 7 natural products had measurable lead content, amounting to approximately 1 $\mu\text{g}/\text{d}$ for 800 mg/d of calcium, between 1 and 2 $\mu\text{g}/\text{d}$ for 1500 mg/d of calcium, and up to 10 $\mu\text{g}/\text{d}$ for renal dosages. Four of the 14 refined products had similar lead content, including up to 3 $\mu\text{g}/\text{d}$ of lead in osteoporosis calcium dosages and up to 20 $\mu\text{g}/\text{d}$ in high renal dosages. No lead was detected in the calcium acetate or polymer products. Lead was present even in some brand name products from major pharmaceutical companies not of natural oyster shell derivation.

Conclusions Despite increasingly stringent limits of lead exposure, many calcium supplement formulations contain lead and thereby may pose an easily avoidable public health concern.

Author Affiliations: Division of Nephrology, Hypertension, and Transplantation, College of Medicine (Dr Ross), and Analytical Toxicology Core Laboratory, Department of Physiological Sciences, College of Veterinary Medicine (Drs Szabo and Tebbett), University of Florida, Gainesville.

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