

The Epidemiology of *Oxalobacter formigenes* and Its Relation to Kidney Stones

***Judith Parsells Kelly*¹, *David W. Kaufman*¹, *Gary C. Curhan*², and *David R. Cave*³**
¹*Slone Epidemiology Center at Boston University, Boston, MA;* ²*Channing Laboratory, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA;* ³*University of Massachusetts Memorial Medical Center, Worcester, MA*

Most kidney stones are comprised primarily of calcium oxalate (CaOx). *Oxalobacter formigenes* is a Gram-negative, anaerobic bacterium present in a large proportion of the normal adult population that metabolizes oxalate in the intestinal tract. Its absence could lead to increased absorption of oxalate in the colon and subsequent excretion in the urine, thus predisposing to the development of stones. To further investigate, 247 adult patients with recurrent CaOx stones, identified in hospitals in Boston, MA and Durham, NC, were compared with 259 age-, sex-, and region-matched controls who were acquaintances of the cases or volunteers. *O. formigenes* colonization was determined by culture of stool samples; covariate information was obtained by interview and self-administered dietary questionnaire. Twenty four-hour oxalate excretion and other urinary risk factors were measured in a subset of 139 cases and 138 controls. The prevalence of *O. formigenes* was 17 percent among cases and 38 percent among controls; based on multivariate analysis controlling demographic factors, dietary oxalate, and antibiotic use, the odds ratio relative to not being colonized was 0.3 (95% confidence interval, 0.2-0.5). The inverse association was consistently present within strata of age, sex, race/ethnicity, region, and antibiotic use. Kidney stone risk increased with increasing urinary oxalate ($p = 0.002$); the odds ratio for *O. formigenes* controlling urinary factors was 0.3 (0.1-0.7). There were no material differences in oxalate excretion according to *O. formigenes* colonization. The results suggest that the presence of *O. formigenes* is associated with a 70 percent reduction in the risk of being a recurrent CaOx stone former.
