

## **MATERNAL SERUM COTININE AS A SURROGATE MARKER OF EARLY CHILDHOOD EXPOSURE TO CIGARETTE SMOKE**

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**Background and Aims:** Obtaining valid measures of past exposures is a challenge in population-based case-control studies. When bio-specimens are collected at study enrollment, measured levels may not reflect actual exposure levels at the sensitive period of development, particularly biomarkers with short half lives in the body. Studies of childhood diseases are further constrained when the collection of bio-specimens from child controls is not feasible. The possibility of using maternal bio-specimens to estimate early childhood exposures is, therefore, a provocative one, although not without significant methodologic considerations.

**Methods:** To evaluate the use of maternal sera with respect to a child's past exposure to tobacco smoke, we measured serum cotinine levels from a subset of 163 mothers of childhood leukemia cases (0-7 years of age) and matched controls enrolled in the California Childhood Leukemia Study (CCLS). Recorded information on demographic characteristics, lifestyle, and environmental exposures, as well as levels of nicotine in household dust samples was available for all subjects. Using multivariable linear regression, we evaluated the relationship between nicotine in household dust samples (ng/g) and maternal serum cotinine (ng/mL), as well as the modifying effects of various epidemiologic factors and sampling characteristics.

**Results:** Not surprisingly, the strongest predictor of maternal serum cotinine was current maternal smoking ( $p < 0.001$ ). When analyses were limited to current non-smokers, household dust nicotine was statistically significantly related to maternal serum cotinine ( $p < 0.001$ ). There was evidence that this relationship was modified by the interval between blood collection and dust collection ( $p = 0.04$ ); paternal smoking ( $p = 0.01$ ); and to a lesser extent maternal height ( $p = 0.07$ ) and household income ( $p = 0.09$ ).

**Conclusions:** Although further exploration of these data is warranted to fully characterize the potential use of maternal serum cotinine to estimate early childhood exposures to tobacco smoke, preliminary results suggest that maternal biomarkers are a useful complement to self-reports and environmental sampling.