

Smoking may negatively impact kidney function among adolescents

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Exposure to tobacco smoke could negatively impact adolescent kidney function; this is according to a new study led by a team of researchers at the Johns Hopkins Bloomberg School of Public Health and the Johns Hopkins Children's Center. They examined the association between exposure to active smoking and kidney function among U.S. adolescents and found the effects of tobacco smoke on kidney function begin in childhood. The results are featured in the April 2013 issue of *Pediatrics*.

"Tobacco use and exposure to secondhand tobacco smoke are major health problems for adolescents, resulting in short-term and long-term [adverse health effects](#)," said Ana Navas-Acien, MD, PhD, senior author of the study and an associate professor with the Bloomberg School's Department of [Environmental Health Sciences](#). "In this nationally representative sample of U.S. adolescents, exposure to tobacco, including [secondhand smoke](#) and active smoking, was associated with lower estimated glomerular filtration rates—a common measure of how well the kidneys are working. In addition, we found a modest but positive association between serum cotinine concentrations, a biomarker of [tobacco exposure](#), among first-morning albumin to creatinine ratio. These findings further support the conclusion that tobacco smoke may damage the kidneys."

Using a cross-sectional study of 7,516 adolescents ages 12 to 17, the authors assessed participant [tobacco use](#) and exposure to secondhand smoke through self-reported data from a home questionnaire and serum cotinine. Participants who reported having smoked "at least one day" in the last month or "at least one cigarette" in the last month, or those who had serum cotinine concentrations over 10 ng/ml were classified as active smokers. Secondhand smoke exposure was defined as non-active smokers who reported living with at least one person who smoked, or who had

cotinine levels greater than or equal to 0.05 ng/ml, but less than or equal to 10 ng/ml even if they reported not living with a smoker. Participants with serum cotinine levels below 0.05 ng/ml, not living with a smoker and not smoking in the last month, were classified as unexposed to tobacco.

Earlier studies examining U.S. adolescent tobacco exposure have indicated more than 600,000 middle school students and 3 million high school students smoke cigarettes and 15 percent of non-smoking adolescents report exposure to secondhand smoke at home. Among adolescents, active smoking has been associated with increased asthma risk, reduced lung function and growth, early atherosclerotic lesions and increased cancer risk as well as premature mortality in adulthood. According to Centers for Disease Control and Prevention, smoking is also a risk factor for several autoimmune diseases, including Crohn's disease and rheumatoid arthritis.

"Small changes in the distribution of estimated glomerular filtration rate levels in the population could have a substantial impact in kidney-related illness, as it is well known for changes in blood pressure levels and hypertension-related disease. Evaluating potential [secondhand smoke exposure](#) and providing recommendations to minimize exposure should continue to be incorporated as part of children's routine medical care," noted Jeffrey Fadrowski, MD, MHS, co-author of the study and an assistant professor in Pediatric Nephrology at the Johns Hopkins School of Medicine.

"Tobacco as a chronic kidney disease risk factor is of great concern given the high prevalence of use and the chronicity that most often accompanies this [exposure](#). Protecting young people from active smoking is essential since nearly 80 percent of adults who smoke begin smoking by 18 years of age," said Navas-Acien.

More information: "Kidney Function and Tobacco Smoke Exposure in US Adolescents," was written by Ester Garcia-Esquinas, Lauren F. Loeffler, Virginia M. Weaver, Jeffrey J. Fadrowski and Ana Navas-Acien.

Provided by Johns Hopkins University Bloomberg School of Public Health

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