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Live

December 28, 2009 -- Children regularly exposed to tobacco smoke at home were more likely to develop early emphysema in adulthood. This finding by researchers at Columbia University's Mailman School of Public Health suggests that the lungs may not recover completely from the effects of early-life exposures to tobacco smoke (ETS). The study is published in the December 2009 *American Journal of Epidemiology*.

This population-based research is the first to examine the association of childhood ETS with early emphysema by CT scan in nonsmokers. Approximately half of the participants in this large multiethnic cohort had at least one regular cigarette smoker in their childhood home. Participants with more childhood ETS exposure had more emphysema-like lung pixels; an average of 20% of scan pixels were emphysema-like for those who lived with two or more smokers as a child, compared with 18% for those who lived with one regular smoker, or 17% for those who said that they did not live with a regular inside smoker as a child.

The researchers studied CT scans of 1,781 non-smokers without clinical cardiovascular disease recruited from six communities in the United States, including northern Manhattan and the Bronx, New York. Those reporting childhood ETS exposure were somewhat younger, with an average age of 61; were more likely to be non-Hispanic white; and less likely to have been born outside the United States. These differences were statistically controlled in the analyses.

"We were able to detect a difference on CT scans between the lungs of participants who lived with a smoker as a child and those who did not," observed Gina Lovasi, PhD, MPH, assistant professor of epidemiology at Columbia's Mailman School of Public Health, and lead author. "Some known harmful effects of tobacco smoke are short term, and this new research suggests that effects of tobacco smoke on the lungs may also persist for decades."

Previous studies have found evidence that childhood ETS exposure affects perinatal and childhood health outcomes, and that adult exposure may affect adult respiratory health outcomes, including lung function and respiratory symptoms.

Although childhood ETS was not associated with adult lung function in this healthy population, this does not contradict the results for early emphysema, since airflow obstruction and anatomic damage are theoretically and clinically distinguishable. "However, emphysema may be a more sensitive measure of damage compared with lung function in this relatively healthy cohort," Dr. Lovasi notes. Combined emphysema and chronic obstructive pulmonary disease are projected to become the third leading cause of death worldwide by 2020.

The exposure information in this study does not provide information on the timing of ETS exposure during childhood, making it difficult to distinguish as exposure in utero. "The association between childhood ETS and early emphysema among participants whose mothers did not smoke, suggests that the effect we are detecting is for smoke exposure in the home during childhood rather than in utero exposure alone," observed Dr. Lovasi.

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About the Mailman School of Public Health

The only accredited school of public health in New York City and among the first in the nation, Columbia University Mailman School of Public Health pursues an agenda of research, education, and service to address the critical and complex public health issues affecting millions of people locally and globally. The Mailman School is the recipient of some of the largest government and private grants in Columbia University's history. Its more than 1000 graduate students pursue master's and doctoral degrees, and the School's 300 multi-disciplinary faculty members work in more than 100 countries around the world, addressing such issues as infectious and chronic diseases, health promotion and disease prevention, environmental health, maternal and child health, health over the life course, health policy, and public health preparedness.

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