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Study examines prenatal exposure to tobacco smoke on inhibition control

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Individuals prenatally exposed to tobacco smoke exhibited weaker response in some regions of the brain while processing a task that measures inhibition control (the ability to control inappropriate responses).

Prenatal tobacco smoke exposure is a risk factor for adverse physical and mental outcomes in children. Growing evidence suggests that smoking during pregnancy may increase the risk of psychopathology such as attention-deficit/hyperactivity disorder (ADHD). Research on ADHD has suggested that individuals with the disorder may exhibit poor inhibitory control.

Functional magnetic resonance imaging was performed at age 25 years on young adults who had been followed since birth to examine the effect of prenatal tobacco smoke exposure on neural activity implicated in externalizing disorders, such as ADHD, with measures of inhibitory control. Lifetime ADHD symptoms were measured over a period of 13 years (from 2 to 15 years of age). The study included 178 mothers (140 of whom were nonsmokers) and 175 offspring for whom ADHD symptoms were measured throughout childhood.

Individuals prenatally exposed to tobacco smoke exhibited less activity in regions of the brain in response to a task that measured inhibitory control vs. neutral stimuli. The group prenatally exposed to tobacco smoke also exhibited more lifetime ADHD symptoms.

"Therefore, our findings strengthen the importance of smoking cessation programs for pregnant women, and women planning to become pregnant, to minimize prenatal exposure to tobacco smoke by the offspring," Nathalie E. Holz, M.A., of Mannheim/Heidelberg University, Germany, and colleagues wrote in their JAMA Phychiatry paper.

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