Maternal smoking tied to inhibition-related brain differences in kids

By Andrew M. Seaman
May 14

NEW YORK (Reuters Health) - Smoking while pregnant may be linked to less control over inhibitions when the child is an adult, a new study that looked at brain scans suggests.

People whose mothers smoked during pregnancy had weaker responses in the regions of their brains known to be involved in inhibition control, compared to those whose mothers didn’t smoke, researchers found.

Inhibition control relates to how people keep their impulses in check and resist distractions in certain situations.

“What’s quite surprising is to find such a reliable effect of prenatal smoke exposure that occurred 25 years before,” Nathalie Holz said.

Holz is the study’s lead author from Mannheim/Heidelberg University in Germany.

She and her colleagues write in JAMA Psychiatry that about 22 percent of European women smoke and about half of them continue to smoke during pregnancy.

Smoking while pregnant has been tied to attention-deficit/hyperactivity disorder, or ADHD, among kids. Children with the condition usually have trouble concentrating and controlling their impulses.

“Now we were interested in what the specific mechanisms are behind this association,” Holz said.

For the new study, she and her colleagues used data collected from 178 mothers and their 25-year-old children, who had been tracked since birth.

The researchers used special magnetic resonance imaging (MRI) scans to see what activity was going on in the young adults’ brains when they were given a test to measure their control over inhibitions.

They found that the brains of the 38 young adults with mothers who smoked during pregnancy didn’t show as much of a response in the areas that are important to inhibition control as those of the 140 people with non-smoking mothers.

The results remained the same when the researchers accounted for other factors, such as parents’ smoking habits after birth and children’s sex, psychological problems and substance abuse.

What’s more, the young adults whose mothers smoked during pregnancy exhibited more ADHD symptoms between ages two and 15, compared to those whose mothers didn’t smoke.

Although the authors can’t explain what caused the differences in brain responses, Holz said they could be related to how those parts of the brain react to nicotine. More studies are needed to figure that out, she said.

“This clearly shows that pregnant women smoking is associated not with just ADHD behavior but other impulsivity behavior,” Pradeep Bhide told Reuters Health.

Bhide, who studies brain development at the Florida State University College of Medicine in Tallahassee, was not involved with the new research.

“I think this confirms previous results in other human studies and some of the other studies in animals and rodents,” he said.

Bhide said his own research has shown the effect of maternal smoking may last into the second generation - meaning a woman’s grandchild may also be at an increased risk of developing ADHD if she smokes during pregnancy.