



Society for Research in Child Development

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Toddlers Exposed to Cigarette Smoke *In Utero* Exhibit Greater Behavioral Problems

The toddlers of women who smoked during pregnancy begin to show a pattern of behavior problems as early as 18-24 months of age, according to a study published in the July/August issue of the journal *Child Development*. The finding comes from a study funded by the National Institute of Drug Abuse and conducted by Lauren Wakschlag Ph.D., and her colleagues at the University of Illinois at Chicago, in collaboration with researchers at the Universities of York (England) and Massachusetts (Boston), and the National Institute of Mental Health. It is the first study to show a link between smoking during pregnancy and child behavior problems in the first years of life.

Researchers suspect that the link between cigarette smoking and behavior lies in the way cigarette smoking affects fetal brain systems that regulate behavior. Nearly a decade ago, Dr. Wakschlag and her colleagues were among the first to report an association between smoking during pregnancy and disruptive behavior disorders in youth. Since that time, many independent studies have confirmed that mothers who smoke during pregnancy are more likely to have teenagers with disruptive behavior disorders and/or who are delinquent.

However, it is difficult to connect an event that occurs during pregnancy to a problem that emerges more than a decade later, notes lead researcher Dr. Wakschlag, an associate professor of psychiatry and director of the Preschool Program of the Disruptive Behavior Clinic at the Institute for Juvenile Research, University of Illinois at Chicago.

Thus, she and her colleagues chose to evaluate toddlers between 12 and 24 months to see if behavioral differences were evident even at that young age. Although mild forms of behavior problems are common during the “terrible twos,” research from Dr. Wakschlag’s laboratory demonstrates that the normal behaviors of this period can be distinguished from clinically concerning disruptive behavior, even in very young children.

The researchers followed 93 toddlers between their first and second birthdays. Forty-seven percent were prenatally exposed to cigarettes. First, researchers examined whether exposed toddlers’ behavior patterns differed over time from non-exposed toddlers. Then they tested whether cigarette exposure was associated with specific types of disruptive behavior.

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“Disruptive behavior is multi-faceted,” explained Dr. Wakschlag. It includes problems regulating aggression, temper outbursts and resistance to social rules and norms. “Since each of these behaviors reflects functioning within different brain regions,” she said, “determining which of these problems are present in young exposed children may help us understand how this increased risk occurs.”

The researchers found that toddlers exposed to cigarette smoke *in utero* exhibited higher levels of behavior problems from 12 through 24 months. Most strikingly, whereas the level of such problems remained relatively stable over time for the non-exposed toddlers, the behavior problems of exposed toddlers substantially increased from 18 to 24 months. Additionally, researchers found that nearly all toddlers with behavior problems in the clinical range at age 2 had been exposed to cigarette smoke.

They also found that exposure to cigarette smoke was associated with social, rather than emotional, aspects of early disruptive behavior. For instance, compared to non-exposed toddlers, exposed toddlers were significantly more likely to exhibit aggressive behavior and to stubbornly refuse to follow directions. They were also less likely to seek out and participate in playful social interactions with their mothers. However, they were no more likely to have temper outbursts or show high levels of irritability than non-exposed children.

The findings, though striking, don’t prove that prenatal exposure to cigarettes *causes* these behavior problems, Dr. Wakschlag warned. “However, our findings do move us one step closer to answering this question by generating ideas regarding what areas of the brain might be affected by exposure,” she said.

“By characterizing how disruptive behavior unfolds in exposed children in the first years of life, we also highlight a window of opportunity for interventions to alter the course of these problems and prevent the development of serious and chronic disruptive behavior disorders in children at risk,” she concluded.

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Summarized from Child Development, Vol. 77, Issue 4, *Elucidating early mechanisms of developmental psychopathology: The case of prenatal smoking and disruptive behavior* by Wakschlag L. and Leventhal B. (University of Illinois at Chicago), Pine D. (National Institute of Mental Health), Pickett K. (University of York, England) and Carter A. (University of Massachusetts-Boston). Copyright 2006, The Society for Research in Child Development, Inc. All rights reserved.