SMOKERS PUT CHILDREN AT RISK FOR LEARNING, BEHAVIOR WOES

The evidence that parental smoking harms children continues to grow, with new research showing a correlation between prenatal or childhood tobacco exposure and a range of behavioral and learning problems.

In one study, Tanya Button and colleagues compiled data from questionnaires sent to families of nearly 2,000 pairs of identical or fraternal twins. Because identical twins share twice as many genes as fraternal twins, twin studies help researchers differentiate between genetic and environmental influences. At the time of the study, all of the twins were between 5 and 18 years old. The researchers asked about symptoms of antisocial behavior or attention deficit hyperactivity disorder (ADHD), and about the number of cigarettes the mothers smoked while pregnant.

Button et al. report, "Maternal prenatal smoking contributed small but significant amounts to the variance of ADHD and of antisocial behavior." Both behaviors were significantly and independently associated with maternal prenatal smoking, with average scores for both ADHD and antisocial behavior increasing with the number of cigarettes the mothers smoked.

In a second study, Kimberly Yolton and colleagues measured levels of cotinine, a tobacco byproduct and an indicator of tobacco smoke exposure, in the blood of 4,399 children between 6 and 16 years of age. Only children whose cotinine tests indicated environmental exposure, rather than first-hand use of tobacco products, were included in the study.

Yolton et al. measured the children's cognitive and academic abilities using standardized IQ and achievement tests, and found a significant correlation between higher cotinine levels and declines in reading and reasoning ability- even when cotinine levels were extremely low. In fact, there was an average one-point decline in reading scores for each unit increase in cotinine at levels above 1 ng/ml, while there was a five-point drop for each unit increase in cotinine at levels below 1 ng/ml. The findings remained true when the researchers controlled for demographic and socioeconomic variables and the children's ferritin levels and blood lead concentration. Yolton et al. say their data, which reveal an association between ETS exposure and cognitive deficits even at extremely low levels of exposure, "support policy to further restrict children's exposure."

The new findings are consistent with more than a dozen earlier studies linking prenatal tobacco exposure to learning and behavior problems (see related articles, *Crime Times*, 2003, Vol. *9*, No. 4, Page 7, *Crime Times*, 2002, Vol. *8*, No. 1, Page 4, *Crime Times*, 2001, Vol. *7*, No. 1, Page 7, *Crime Times*, 1999, Vol. *5*, No. 3, Page 7, and *Crime Times*, 1999, Vol. *5*, No. 2, Page 1).

"Relationship between antisocial behaviour, attention-deficit hyperactivity disorder and maternal prenatal smoking," T. M. M. Button, A. Thapar, and P. McGuffin, *British Journal of Psychiatry, Vol. 187,* 2005, 155-60. Address: Tanya M. M. Button, Institute for Behavioral Genetics, 447 UCB, Boulder, CO 80309-0447, tanya.button@colorado.edu.

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"Exposure to environmental tobacco smoke and cognitive abilities among U.S. children and adolescents," K. Yolton, K. Dietrich, P. Auinger, B. P. Lanphear, and R. Hornung, *Environmental Health Perspectives, Vol. 113, No. 1,* January 2005, 98-103. Address: Kimberly Yolton, Cincinnati Children's Environmental Health Center, Cincinnati Children's Hospital Medical Center, Cincinnati, OH 45229-3039, kimberly.yolton@cchmc.org.

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