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Prenatal Tobacco Exposure and Brain Morphology: A Prospective Study in Young Children.

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Source

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Abstract

It is well known that smoking during pregnancy can affect offspring health. Prenatal tobacco exposure has been associated with negative behavioral and cognitive outcomes in childhood, adolescence, and young adulthood. These associations between prenatal tobacco exposure and psychopathology in offspring could possibly be explained by the influence of prenatal tobacco exposure on brain development. In this prospective study, we investigated the association between prenatal tobacco exposure, behavioral and emotional functioning and brain morphology in young children. On the basis of age and gender, we matched 113 children prenatally exposed to tobacco with 113 unexposed controls. These children were part of a population-based study in the Netherlands, the Generation R Study, and were followed from pregnancy onwards. Behavioral and emotional functioning was assessed at age 6 with the Child Behavior Checklist. We assessed brain morphology using MRI (MRI) techniques in children aged 6-8 years. Children exposed to tobacco throughout pregnancy have smaller total brain volumes and smaller cortical gray matter volumes. Continued prenatal tobacco exposure was associated with cortical thinning, primarily in the superior frontal, superior parietal and precentral cortices. These children also demonstrated increased scores of affective problems. And, thickness of the precentral and superior frontal cortices was associated with affective problems. Importantly, brain development in offspring of mothers who quit smoking during pregnancy resembled that of non-exposed controls (no smaller brain volumes and no thinning of the cortex). Our findings suggest an association between continued prenatal tobacco exposure and brain structure and function in school-aged children.Neuropsychopharmacology accepted article preview online, 7 October 2013. doi:10.1038/npp.2013.273.

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