

Prenatal meth exposure linked to abnormal brain development

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A first of its kind study examining the effects of methamphetamine use during pregnancy has found the drug appears to cause abnormal brain development in children. The research is published in the April 15, 2009, online issue of *Neurology*, the medical journal of the American Academy of Neurology.

"[Methamphetamine](#) use is an increasing problem among women of childbearing age, leading to an increasing number of children with prenatal meth exposure," said study author Linda Chang, MD, with the John A. Burns School of Medicine, University of Hawaii at Manoa in Honolulu. "But until now, the effects of prenatal meth exposure on the developing brain of a child were little known."

For the study, [brain scans](#) were performed on 29 three and four-year-old children whose mothers used meth while pregnant and 37 unexposed children of the same ages. The MRI scans used diffusion tensor imaging to help measure the diffusion of molecules in a child's brain, which can indicate abnormal microscopic brain structures that might reflect abnormal [brain development](#).

The scans showed that children with prenatal meth exposure had differences in the [white matter](#) structure and maturation of their brains compared to unexposed children. The children with prenatal meth exposure had up to four percent lower diffusion of molecules in the white matter of their brains.

"Our findings suggest prenatal meth exposure accelerates brain development in an abnormal pattern," said Chang. "Such abnormal brain development may explain why some children with prenatal meth exposure reach developmental milestones later than others."

Studies have shown that prenatal meth exposure can lead to increased stress and lethargy and poorer quality of movement for infants.

"While we don't know how prenatal meth exposure may lead to lower brain diffusion, less diffusion of molecules in white matter typically reflects more compact axonal fibers in the brain," said Chang. "This is consistent with our prior findings of smaller subcortical structures in children with prenatal meth exposure, which is the portion of the brain immediately below the cerebral cortex."

Long-term studies are underway to determine if the brain differences found in [children](#) with prenatal exposure to meth will normalize with age.

Source: American Academy of Neurology ([news](#) : [web](#))

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