

Fetal Exposure to Methamphetamine May Harm Child's Brain

Scans show neurological differences in toddlers born to drug abusers

By Alan Mozes

HealthDay Reporter

WEDNESDAY, April 15 (HealthDay News) -- In what researchers are calling the first study of its kind, methamphetamine use among pregnant women has been found to prompt abnormal brain development among young children exposed to the drug in the womb.

Whether those changes translate into longer-term troubles remains to be seen, one expert said.

"If we accept the conclusion here that prenatal methamphetamine use does affect the young child's brain development, then the next step is to look at what the consequences could be in real terms," said Dr. James Garbutt, M.D., a professor of psychiatry at the University of North Carolina at Chapel Hill.

Garbutt was not involved in the research, which was led by Dr. Linda Chang and Christine C. Cloak, both of the department of medicine at the University of Hawaii at Manoa, in Honolulu. They published the findings in the April online issue of *Neurology*.

According to the U.S. National Institute on Drug Abuse, methamphetamine is an extremely addictive and easily abused stimulant that targets the central nervous system by prompting the release of large amounts of the brain chemical dopamine. The agency notes that, as of 2006, there were an estimated 731,000 American methamphetamine users over the age of 12.

Prior research has suggested that prenatal exposure to the drug appears to result in the development of poorer motor skills and higher stress levels among infants and young children, the Hawaiian researchers noted.

But to better explore the issue, the research team used high-tech "diffusion-tensor" magnetic resonance imaging (DTI) to scan the brains of 29 children between the ages of 3 and 4, all of who had been exposed to the drug in utero. Those images were then compared to scans taken of 37 similarly aged children with no such exposure.

By mapping out microscopic structural changes in the children's brains, the researchers identified clear differences in both "white matter structure" and brain maturation between the exposed and unexposed children.

The study authors say the disparities may reflect abnormal developmental patterns among exposed versus unexposed offspring. Fetal methamphetamine exposure may result in more "compact" nerve fibers, as well as greater spine density, compared to unexposed children, they said.

But might this affect children long-term? According to Garbutt, more follow-up is necessary to gauge whether fetal methamphetamine exposure has a lasting detrimental impact as children age.

"The concept of methamphetamine use is of course is very bad in the public's mind and with good cause," he said. "The ravages of addiction are clear. You don't take care of yourself or your family, and the drug becomes the be-all and end-all of life. But that said, understanding what exactly exposure to the drug does to the fetus is still a scientific

question that is not simple to answer and is very difficult to study."

"We have to explore, for example, whether or not there is a relationship between this finding and later emotional and cognitive behavior regulation problems," Garbutt said. "And does exposure then contribute to learning problems among children? If so, this would draw attention to yet another aspect of an addiction that is clearly already a serious health problem."

More information

For more on methamphetamine, visit the [U.S. National Institute on Drug Abuse](#).

SOURCE: James Garbutt, M.D., professor, psychiatry, department of psychiatry, and research scientist, Bowles Center for Alcohol Studies, University of North Carolina at Chapel Hill; April 2009 Archives of Neurology, online

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