

A Shot to Prevent Effects of Mother's Smoking in Pregnancy?

Claire D. Coles, Ph.D.

Director, Maternal Substance Abuse and Child Development Program
Department of Psychiatry and Behavioral Sciences
Emory University School of Medicine

As early as the 1950's, doctors were telling pregnant women not to smoke because babies of smokers are likely to weigh less. Since that time, other problems have been identified including higher rates of miscarriage and an increased risk of sudden infant death syndrome (SIDS). Recently, it appears that children who were exposed prenatally to nicotine and the 4000 other toxins in cigarette smoke may have more behavior problems and higher rates of dyslexia.

Because of these negatives, one of the many ways that the National Institute on Drug Abuse (NIDA) has supported smoking cessation is by funded research on using vaccines. A vaccine is a shot that is given to a healthy person that causes that person's body to develop antibodies to resist disease. One of the goals of this research is to find a medication that could be given safely to the 20% of pregnant women who smoke. When a mother smokes during pregnancy, the nicotine in her blood passes both to her brain and through the placenta to the fetus despite the body's natural protective systems. One of the body's protective systems is a "blood-brain" barrier to prevent toxins and foreign organisms from getting to the brain. The placenta acts the same way to protect the fetus. However, it can only screen out molecules above a certain size.

Recently, a vaccine called NicVAX was developed by Nabi Biopharmaceuticals. This vaccine is directed not against a virus or bacteria that causes a disease but against the nicotine in cigarette smoke. The NicVAX causes the nicotine molecule to join with a

protein in the blood. This connection causes the body's natural defense system to make antibodies. The antibodies and the nicotine molecules make a complex molecule that is too big to cross either to the brain of the mother or through the placenta to the fetus. The result is that the mother does not experience the pleasurable effects of smoking on the brain. In addition, the nicotine does not affect her fetus.

This study is encouraging and suggests that, in the future, there may be ways in which pregnant women can be supported when they attempt to quit smoking. However, the authors cautioned that this was a preliminary finding that will require more study before it can be used widely. They are not sure how long the effect of the vaccine will last and whether it will block all of the nicotine if the mother continues to smoke. In animal studies using rats, effects of chronic exposure to smoke were not blocked by the experimental treatment. So, for the present time, women who are pregnant and trying to stop smoking for the benefit of their future child will have to continue to rely on will power and the support of family, friends, and the advice of health care providers.

For further information regarding this article please contact Claire Coles, PhD. at the Maternal Substance Abuse and Child Development Project, Emory University School of Medicine, Department of Psychiatry and Behavioral Sciences, 1256 Briarcliff Road, N.E., Suite 309W, Atlanta, Georgia, 30306. You can also phone us at 404-712-9800 or visit our website at <http://www.emory.edu/MSACD>

The Maternal Substance Abuse and Child Development Project is funded in part by the Georgia Department of Human Resources Division of Public Health

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