



# Prenatal Smoking Linked to Digit Defects

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**W**OMEN THINKING OF STARTING a family have likely heard that smoking may increase their risks of infertility, ectopic pregnancy, and spontaneous abortion. Now they have another reason to steer clear of cigarettes. In the largest study of its kind, plastic surgeons found that smoking during pregnancy increases the risk of having a child with excess, webbed, or missing fingers and toes.

The study, appearing in the January issue of *Plastic and Reconstructive Surgery*, revealed that smoking a half of a pack per day or less significantly increases the risk of having a child born with such digit defects (Man LX and Chang B. *Plastic Reconstr Surg.* 2006; 117:301-308).

## SURPRISING FINDINGS

Polydactyly (more than five digits on the hands or feet), syndactyly (fused or webbed fingers or toes), and adactyly (absence of fingers or toes) usually occurs without any family history, and parents often ask why one of these abnormalities developed in their child, said Benjamin Chang, MD, of the University of Pennsylvania, in Philadelphia, who coauthored the study. Studies have shown that certain medications, as well as substances such as cocaine and alcohol, may cause congenital limb abnormalities when used during pregnancy. Therefore, environmental factors may play a role in digit defects as well, and smoking was an obvious culprit.

"We focused on cigarette smoking because that's one of the things that you can actually do something about," said Chang, who treats many children with these deformities. But the extent of the effects of smoking was not expected. "The findings actually surprised me; the size of the increase in risk was fairly significant," said Chang.

By analyzing the US Natality database from 2001 and 2002 and examining the records of more than 6.8 million live births (more than 84% of all US births), Chang and colleagues identified 5171 children born with congenital digital anomalies and 10 342 matched controls. Approximately 87% of the mothers of children with an anomaly and 89% of mothers of the controls did not smoke.



A large study reveals that smoking even 10 cigarettes or fewer per day during pregnancy increases the risk of having a child born with excess, webbed, or missing fingers and toes.

Through their investigation, the study authors found that the more cigarettes a pregnant woman smoked, the greater the risk of having a child with a toe or finger deformity. Smoking one to 10 cigarettes per day during pregnancy was associated with a 29% increased risk, 11 to 20 cigarettes per day was associated with a 38% increased risk, and 21 or more cigarettes per day was associated with a 78% increased risk. Even after the data were adjusted for potential confounding factors (including maternal anemia, cardiac disease, lung disease, diabetes, and hypertension), the increased risks for each group did not change significantly, with a 27%

increased risk among women who smoked up to 10 cigarettes per day, 38% increased risk for those who smoked 11 to 20 cigarettes per day, and 57% increased risk for those who smoked 21 or more cigarettes daily.

Chang noted that while these findings are compelling, the risk of these abnormalities occurring in the first place is quite small. "The risk of individual anomalies like syndactyly is about 1 in 2000 to 2500 live births, so even if you increase that by 30%, it's still a fairly small number," said Chang.

## ANOTHER REASON TO STOP

Fewer women who are pregnant smoke than their nonpregnant counterparts. According to the US Department of Health and Human Services' 2004 National Survey on Drug Use and Health, 18% of pregnant women aged 15 to 44 years smoked cigarettes in the past month compared with 30% of those who were not pregnant.

But Chang noted that many women may not necessarily know they are pregnant when limb formation begins, around 4 weeks of gestation. "For that very reason, any woman of childbearing age who thinks she might want to have children should really think about stopping smoking in advance," said Chang. He added that many of these abnormalities can be treated with surgery, though. "It's certainly not as strong a reason [to stop] as some of the other conditions that we've been harping on for ages now—like lung cancer, emphysema, heart disease, stroke, all of which could kill you."

More information on the effects of smoking on the fetus may become available in the future. The 2003 revision of the US Standard Certificate of Live Birth includes new questions on maternal smoking behavior during the 3 months before pregnancy and for each trimester of pregnancy, data that could provide new insights into the behavior's effects on fetal development. □