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Study uncovers link between smoke, asthma

Researchers focus on 120 infants living in Syracuse. Tests gauge environment.

May 25, 2003

By **Mark Weiner**
 Staff writer

A study of Syracuse newborns who have a family history of asthma found the very same children most at risk for the disease are exposed to unhealthy amounts of cigarette smoke in their homes.

About 71 percent of 120 infants in the study live in homes where a parent or occupant smokes, increasing chances the children will develop asthma, according to the study presented last week at an international conference of the American Thoracic Society.

"It's likely that a very high percentage of these infants will develop asthma, probably 50 percent or more," said Dr. Jerrold Abraham, a professor of pathology at Upstate Medical University in Syracuse who is leading the research effort.

The two-year study, to determine the role of indoor air pollution in the onset of childhood asthma, looked at a variety of pollutants that could trigger the often debilitating, chronic disease.

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In the initial results from the study, cigarette smoke emerged as the single biggest indoor pollutant, with fine particles showing up in tests of indoor air. Also, high levels of a chemical produced from exposure to nicotine showed up in quarterly tests of the infants' urine.

"Environmental tobacco smoke makes up nearly all of the measured particulate matter in the indoor air in most of these homes," Abraham said.

The study measured levels of dust, cockroach droppings, cat and dog allergens, mold spores, chemicals and airborne particulates from cigarettes, diesel exhaust and other indoor pollutants suspected as triggers of asthma.

"It's much more detailed than most other studies that have tried to look at the health of newborns," Abraham said. "The smoking may overshadow many of the other things that we are trying to study."

Glenn Ivers, executive director of the American Lung Association of Central New York, said the study may reinforce what many have long believed.

"Smoking around children of any age, and particularly infants, has grave consequences," Ivers said. "We've suspected from our experience that smoking contributes to asthma in children. Perhaps this study is the smoking gun that we need to connect the dots."

The Lung Association works to educate mothers such as those in Syracuse about the risks of smoking, particularly indoors. About 25 percent of adults in Onondaga County are smokers. But the higher level found among mothers of high-risk children makes it clear there is more work to do, Ivers said.

"It's very disturbing, but it's not surprising," he said of the Syracuse study. "Second-hand smoke is a carcinogen. It's very harmful to infants. Their size and underdevelopment of their lungs makes them even more susceptible."

The Syracuse infants, now about a year old, live in the

city's low-income urban core, typical of neighborhoods across the nation where childhood asthma is on the rise at rates that alarm public health officials.

Asthma disproportionately affects blacks, women and children, especially those under the age of 4.

For children under age 4, the incidence of asthma jumped 160 percent from 1980 to 1994, according to the U.S. Centers for Disease Control and Prevention.

Local scientists, working under the umbrella of the New York Indoor Environmental Quality Center in Syracuse, set out to learn what factors make someone asthmatic.

By following more than 100 infants in their first year of life, the scientists want to determine the role that indoor air pollution plays in triggering childhood asthma.

Upstate Medical University, Syracuse University and the State University College of Environmental Science and Forestry at Syracuse collaborated



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on the research project, supported by a \$2.3 million grant from the U.S. Environmental Protection Agency.

R. Leland Davis, president of the New York Indoor Environmental Quality Center, said the study found some key asthma triggers in the home are at levels 10 times higher than found in the outdoor environment.

But the exceptionally high rate of indoor smoking in the Syracuse homes adds a new dimension to the search for links to childhood asthma, Davis said.

"I thought it was a little surprising," he said. "Recently some studies have blamed childhood asthma on the fine particles from diesel truck emissions in urban environments."

The full results of the study will be presented at the NYIEQ's annual scientific forum in October.

The study began in 2001 when doctors recruited expectant mothers in Syracuse with a history of asthma.

Previous studies elsewhere had indicated that up to 40 percent of children in urban areas will develop asthma if their mothers had the disease.

Scientists are puzzled by the fact that some children with a genetic history develop the disease, while others never show symptoms.

The local research included:

A clinical study involving interviews with mothers before they gave birth, and sampling of the infants' umbilical cord blood at birth.

Geri Hall, a family nurse practitioner at Upstate Medical University, visited each of the infants and their mothers quarterly.

Hall conducted exams of the infants, checked for respiratory problems and collected urine samples to check for levels of cotinine, the chemical marker for exposure to secondhand cigarette smoke.

Environmental sampling examined the indoor air of the city homes for dust particles; volatile organic chemicals that come from cleaning compounds, paints, carpets and furniture; nitrogen dioxide from combustion in gas stoves; ozone; carbon dioxide; humidity; and other common indoor pollutants.

Susan Anagnost, a mycologist at SUNY ESF, led a team that conducted tests to identify the number and type of indoor molds in the homes, and compare them to the molds found outdoors.

Vacuums equipped with special filters collected dust that was tested for dust mites, along with cockroach droppings and other allergens collected from kitchens, living rooms and the beds of each infant.

Researchers also tested for endotoxin, a marker for bacterial products from dog and cat droppings.

Abraham said the study may be useful to public health officials assessing their efforts to help smokers quit.

The NYIEQ wants to conduct follow-up studies to test strategies aimed at eliminating the indoor pollution that causes asthma, Davis said.

Carrier Corp., in DeWitt, a partner in the NYIEQ, is designing prototype air purification devices that will be tested in five Syracuse homes with older children who have asthma.

No date has been set for the start of that study.

"From our perspective, one of the things that is important to us is intervention strategies," Davis said.

"If the smokers are in the house, the question is how do you improve the ventilation and take the smoke out of the air?"

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