Secondhand smoke exposure worse for toddlers, obese children

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Toddlers and obese children suffer more than other youth when exposed to secondhand smoke, according to research presented at the American Heart Association's Scientific Sessions 2009.

"Secondhand smoke in children is not just bad for respiratory issues, as has been previously described by other researchers," said John Anthony Bauer, Ph.D., the study's senior co-author and principal investigator at Nationwide Children's Hospital & Research Institute at Ohio State University in Columbus. "Our data support the view that cardiovascular effects of secondhand smoke in children are important, particularly for the very young and those who are obese. We had not investigated the impact of obesity in previous studies."

Bauer and colleagues recruited American boys and girls, including 52 toddlers (ages 2 to 5 years) and 107 adolescents (ages 9 to 18 years). The study included black, white and Hispanic children, including obese toddlers and adolescents.

The researchers found:

- There was a link between the amount of secondhand smoke exposure and a marker of vascular injury in toddlers. This link was two times greater in toddlers who were obese.

- Obese adolescents exposed to secondhand smoke had two times
the evidence of vascular injury compared to normal-weight adolescents.

- Toddlers had a four times greater risk of secondhand smoke exposure when compared to adolescents, despite having similar reported home exposures.

- **Toddlers** exposed to secondhand smoke had a 30 percent reduction in circulating vascular endothelial progenitor cells, a cell type involved in repair and maintaining a healthy blood vessel network.

"The changes we detected in these groups of children are similar to changes that are well recognized risks for heart disease in adults," Bauer said. "This suggests that some aspects of adult heart disease may be initiated in early childhood, where prevention strategies may have great long-term impact."

Bauer and colleagues determined the extent of secondhand smoke exposures and, via blood samples, analyzed vascular injury markers and inflammation for each child. They also measured the numbers of circulating vascular endothelial progenitor cells. They obtained height, weight, blood pressure and socioeconomic information for each child studied.

Many forms of cardiovascular disease start in childhood, and at least a quarter of children in the United States are exposed to secondhand smoke. Researchers tried to determine if children exposed to secondhand smoke had measurable changes in markers of cardiovascular disease and if some children, particularly **obese children**, were at greater risk of these problems.

"We do know that secondhand smoke as well as smoking causes
increased oxidation and inflammation," Bauer said. "Separately, other studies within the past few years have shown that obesity is a physiological condition of chronic low-grade inflammation, and that this can lead to vascular damage. We think that the two factors together (eg., smoke exposures plus obesity) may interact to amplify the degree of inflammation or vascular cell damage that occurs."

Bauer and colleagues looked at a cross-section of children at one point in time. Whether these differences progress or change over time as the children grow is unknown.

"Our findings add to the importance of eliminating smoking and related exposures, especially for children, and obese children may need to be even more protected from these exposures," Bauer said.

Source: American Heart Association (news : web)


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