

Children Under Stress Develop More Fevers

March 6 2007

Children whose parents and families are under ongoing stress have more fevers with illness than other children. Published this month in the *Archives of Pediatric and Adolescent Medicine*, the study also shows the unanticipated conclusion that children's natural killer cell function, part of the body's innate immune system, increases under chronic stress, unlike adults, whose function is decreased.

“These findings are somewhat surprising to me but also exciting because they show us possible new avenues for improving children's health,” said Mary Caserta, M.D., principal investigator of the study and associate professor of Pediatrics in the division of Pediatric Infectious Diseases at the University of Rochester Medical Center. “I figured families under stress might think their children were sick more often when they actually weren't, but fevers are not subjective. These kids living with chronic stress in their families really were sick more often.”

While an illness with a fever isn't necessarily any worse than an illness without one, it does point to an objective sign of illness, often an infection, Caserta said. This suggests an association between family stress and susceptibility to infectious diseases.

Caserta undertook the study with collaborator Peter Wyman, Ph.D., associate professor of Psychiatry at the University of Rochester. Wyman, who designed one of the stress surveys used in this study, has led other studies of urban families and their children under stress and his research has shown links between chronic parent stress and children's emotional well-being. This new study is innovative because it links stress

to objective health and biological indicators of immune function. The study is one of the few that have examined the effects of stress on children's immune function.

One of the more surprising findings of the study is that children's natural killer cell function increases under chronic stress. Previous research with mostly older adults has shown that chronic stress decreases their natural killer cell function. (Natural killer cells are part of the immune system that exists before a new germ is introduced; it is the first line of defense for the body until the immune system adapts to fight a specific bacteria or virus.)

“It may have something to do with the fact that children's immune systems are still developing,” Caserta said. “Or maybe they're compensating for a defect someplace else. More research is needed to figure out why.”

The study followed 169 diverse 5 to 10 year olds for 3 years. Children and their parents were recruited from a population already participating in a study of childhood infections at the University's Golisano Children's Hospital at Strong. The study involved seven visits about six months apart. Parents were given digital thermometers and they were asked to record their children's health status every week and every time their children were ill.

Parents also completed surveys to assess their own and their family stress over the course of the study. They were asked about psychiatric symptoms, such as depression and anxiety, and they were asked about their relationship with their children, such as whether they felt detached from their child or overwhelmed by their parenting responsibilities. In addition, parents reported on external stressors such as exposure to violence and unemployment.

Building on this study, the researchers hope to determine what types of parental and family stress lead to increased illnesses and what biological processes control susceptibility to infections. “Once we understand these connections we can design interventions that lower family stress, or help families to better manage stress in their interactions – and lead to healthier kids,” she said.

Source: University of Rochester Medical Center

Citation: Children Under Stress Develop More Fevers (2007, March 6) retrieved 24 April 2024 from <https://medicalxpress.com/news/2007-03-children-stress-fevers.html>

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