

## Early childhood stress has lingering effects on health

January 26 2009

Stressful experiences in early childhood can have long-lasting impacts on kids' health that persist well beyond the resolution of the situation.

The conclusion comes from a study revealing impaired immune function in adolescents who, as youngsters, experienced either physical abuse or time in an orphanage, when compared to peers who never experienced such difficult circumstances. The report from the University of Wisconsin-Madison appears online the week of Jan. 26 in the *Proceedings of the National Academy of Sciences*.

"Even though these children's environments have changed, physiologically they're still responding to stress. That can affect their learning and their behavior, and having a compromised immune system is going to affect these children's health," says senior author Seth Pollak, a professor of psychology and pediatrics at UW-Madison.

As director of the Child Emotion Laboratory in the UW-Madison Waisman Center, Pollak focuses on how experiences early in life affect children's subsequent development. In the current work, he and fellow Wisconsin psychology professor Chris Coe, an expert on the links between stress and immunity, turned to the immune system as a way to isolate the consequences of early events.

"The immune system is not preset at birth," says Coe. "The cells are there, but how they will develop and how well they'll be regulated is very much influenced by your early environment and the type of rearing you



have."

Led by Elizabeth Shirtcliff of the University of New Orleans when she was a postdoctoral fellow at UW-Madison, the authors evaluated immune-system strength among adolescents who had experienced either typical or unusually stressful childhoods. The researchers looked for high levels of antibodies against the common and usually latent herpes simplex virus type 1 (HSV-1).

While roughly two-thirds of Americans carry this virus, which causes cold sores and fever blisters, people with healthy immune systems are able to keep the virus in check and rarely if ever have symptoms typically, only when stress or illness taxes the immune system. However, people with weakened immune systems may have trouble suppressing HSV-1 and produce antibodies against the activated virus.

"We can use the control of latent viruses as one way of assessing the competence of the immune system," Coe explains. "During times of stress or if the immune system is not appropriately regulated, the herpes virus is more likely to reactivate."

A group of adolescents with documented incidents of past physical abuse and stressful home environments had higher levels of HSV-1 antibodies, showing that their immune systems were compromised.

"That is very unfortunate, but it was not surprising," Pollak says, since stress is widely known to have negative impacts on immune function. "It suggests that children's emotional environments are having widespread repercussions on their health."

What was more surprising, however, was that another group of adolescents in the study, who spent time in orphanages in Romania, Russia or China before being adopted by U.S. families, showed a similar



impairment of immune regulation.

"These children began their lives in a stressful environment, but they're now adolescents, and for a decade, they've been living in stable, affluent, loving environments. And yet, their immune systems are compromised as well. In fact, they look just like the physically abused kids," says Pollak.

While antibodies are typically measured in blood, the researchers used saliva instead to eliminate any acute stress related to collecting the samples. There was no difference among the groups in likelihood of carrying HSV-1, so the results reflect a difference only in the ability to fight its activation.

"The bottom line is that these early stressors can really have long-term implications," Pollak says.

He is particularly concerned about the implications of his findings given the current economic downturn. International adoptions are expensive and will likely become harder for many U.S. families, leaving greater numbers of children in institutional settings for longer periods of time.

Source: University of Wisconsin-Madison

Citation: Early childhood stress has lingering effects on health (2009, January 26) retrieved 8 May 2024 from <u>https://medicalxpress.com/news/2009-01-early-childhood-stress-lingering-</u> <u>effects.html</u>

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