

## Some Eczema Sufferers More Prone to Smallpox and Other Viruses

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Widespread smallpox vaccination would pose some new concerns, especially for people with eczema, according to study author Lisa Beck, M.D.

(PhysOrg.com) -- Since the World Health Organization proclaimed smallpox officially eradicated in late 1979 - thanks to vaccination programs that produced a protective "herd immunity" for most of the globe - fear of the fever-causing, blistering, sometimes fatal infectious disease has faded. In fact, in the more than three decades that the disease has been wiped out, routine smallpox vaccination has virtually stopped for most of the population.

But when the Sept. 11 tragedies fanned fears of potential bioterrorist attack with a smallpox weapon, the nation swiftly began ramping up its vaccine supply. Unfortunately, the vaccine itself is thought to possibly



pose threat to as much as half the nation's population - including people with <u>atopic dermatitis</u> (or eczema, a red, flaky, itchy skin disease), people who are HIV-positive, organ transplant recipients, and patients on immunosuppressive therapies. New research e-published in the <u>Journal</u> of <u>Allergy and Clinical Immunology</u> this month sheds some light onto which subsets of eczema patients might be most at risk for complications from smallpox vaccinations, and offers some clues into why.

"Widespread smallpox vaccination would pose some new concerns," said Lisa Beck, M.D., an associate professor of both Dermatology and Medicine at the University of Rochester Medical Center, and the study's lead author. "Historical records suggest that eczema patients are at heightened risk for developing a serious infection from the active vaccina virus - a cousin to the smallpox virus - that's used in smallpox vaccines. Worse, since halting these immunizations some thirty years ago, the incidence of eczema has been doubling every fifteen years."

Beck said that an estimated 20 percent of children now suffer from eczema.

"These infections could prove fatal in as many as 20 percent of cases," she added. "More shockingly, they not only occurred in eczema patients who were immunized themselves, but also in eczema patients who simply came in contact with other recently vaccinated individuals."

In March 2007, a newly immunized U.S. Army soldier (some armed service personnel and health care workers continue to receive smallpox vaccine) had his deployment temporarily delayed and returned home to wait with his family in Indiana. When he accidentally infected his 2-yearold son (who had eczema), the boy became seriously ill, making national headlines and rekindling appreciation for the potential risks of the smallpox vaccine.



Just last week, Beck and colleagues nationwide released findings from a multi-center study aiming to gain a better profile of which eczema sufferers are most predisposed to serious skin infections. The study, funded by the National Institute of Allergy and Infectious Disease, drew nearly 900 volunteers across seven research sites. Participants answered questions about their eczema, whether or not they'd experienced eczema herpeticum (or EH, a widespread viral skin infection that's unique to eczema patients and caused by the herpes simplex virus) or bacterial skin infections, plus whether or not they had asthma or food allergies. Their potential for sensitization to other common allergens was analyzed, as were their levels of key immune cells (and immune cell mediators).

"We split the participants into three groups - healthy control subjects, eczema sufferers who had contacted EH at some point, and eczema sufferers who never had EH," Beck said. "Our hunch was that the middle group was susceptible to numerous severe skin infections. We wanted to first confirm that, and then start to paint a picture that could help us, in the future, to easily distinguish this most vulnerable subset of patients."

Differences cropped up quickly between the two groups of eczema sufferers. Those who had a history of EH not only had more severe eczema than those without EH, but were more likely to have been diagnosed as youngsters, typically before age 5. They also were more prone to allergic disorders, like asthma and food allergies; were more sensitized to common perennial allergens (which live year-round inside homes, and include dust mites, pet dander and cockroaches); and were more than two and a half times more likely to contract bacterial skin infections with Staphylococcus aureus.

"The blood from this EH group also held some clues," Beck said. "It hinted that they were producing the same hypersensitive immune response that we typically only see in people with severe allergies."



This abnormal reaction is dominated by the wrong kind of immune cell - a Type 2 helper T cell.

"These overly-excited Type 2 helper cells rush into action, causing extreme inflammation," Beck said. "Unfortunately these particular T cells inhibit the manufacturing of important antimicrobial proteins and hinder the skin's ability to serve as a strong barrier, thereby weakening the body's ability to fend off common pathogens, including viruses and bacteria."

Insights gleaned from this research could make clinicians better aware of which patients would require the closest monitoring after vaccination, Beck said.

"In the wake of a biological attack, we might be forced to immunize everyone within a certain radius, regardless of the potential personal danger," she said.

Beck adds that this study, like many others, continues to challenge the long-held assumption that human skin is little more than a flexible fence.

"We're starting to realize that the skin is much more than an inert barrier," she said. "It seems to actually play a critical roll in jumpstarting the immune response. If you run with that idea, it's easy to see how 'chinks in the armor' from a chronic skin disorder like <u>eczema</u> might help explain why some people are more defenseless than others when it comes to warding off certain viruses."

Provided by University of Rochester (<u>news</u> : <u>web</u>)

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