

Common Pain Relievers May Dilute Power of Flu Shots

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(PhysOrg.com) -- With flu vaccination season in full swing, research from the University of Rochester Medical Center cautions that use of many common pain killers - Advil, Tylenol, aspirin - at the time of injection may blunt the effect of the shot and have a negative effect on the immune system.

Richard P. Phipps, Ph.D., professor of Environmental Medicine, Microbiology and Immunology, and of Pediatrics, has been studying this issue for years and recently presented his latest findings to an international conference on inflammatory diseases.

“What we’ve been saying all along, and continue to stress, is that it’s probably not a good idea to take common, over-the-counter pain relievers for minor discomfort associated with vaccination,” Phipps said. “We have studied this question using virus particles, live virus, and different kinds of pain relievers, in human blood samples and in mice -- and all of our research shows that pain relievers interfere with the effect of the vaccine.”

A study by researchers in the Czech Republic [reported similar findings](#) in the Oct. 17, 2009, edition of *The Lancet*. They found that giving acetaminophen, the active ingredient in Tylenol, to infants weakens the immune response to vaccines.

Phipps’ research has tested whether production of antibodies using a cell culture system was blunted by over-the-counter pain relievers. He found

that a variety of pain relievers - even though Tylenol and Advil have different ingredients -- seemed to dilute the production of necessary antibodies to protect against illness.

Many of the pain relievers in question are classified as NSAIDs or nonsteroidal anti-inflammatory drugs, which act in part by blocking the cyclooxygenase-2 (cox-2) enzyme. Blocking the cox-2 enzyme is not a good idea in the context of vaccination, however, because the cox-2 enzyme is necessary for the optimal production of B-lymphocytes.

Therefore, when a person takes a medication to reduce pain and fever, he or she might also inadvertently reduce the ability of B cells to make antibodies.

Phipps and colleagues also demonstrated that timing of the administration of pain relievers is important as well, according to the study [published earlier this year](#) in the journal *Cellular Immunology*.

They exposed human cells and mice to ibuprofen, Tylenol, aspirin and naproxen (Aleve) in amounts comparable to doses commonly used by millions of Americans every day to prevent or treat pain and fever, or arthritis, or to prevent heart attack and stroke.

Treatment during the earliest stages of inflammation - or when the first signs of pain, swelling, redness or fever would occur - had the most detrimental effects on the immune system, the study noted.

The connection between NSAIDs and antibody production is still being actively pursued. Phipps said researchers believe ibuprofen, in particular, affects lymphocytes' ability to produce antibodies.

Meanwhile, until a full clinical trial provides a clearer picture, Phipps urges regular users of NSAIDs to be aware of the risks.

“NSAIDs are one of the most commonly used drugs; they are recommended for all age categories, are prescribed for relieving transient pain or in cases of serious inflammatory diseases,” Phipps said. “By decreasing antibody synthesis, NSAIDs also have the ability to weaken the [immune system](#) which can have serious consequences for children, the elderly and the immune-compromised patients.”

Provided by University of Rochester ([news](#) : [web](#))

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