Medical Xpress

Immune responses to flu vaccine are diminished in lupus patients

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Patients with the autoimmune disease systemic lupus erythematosus (SLE) have an increased risk of infection, due to both disturbances in their immune responses and treatment with immunosuppressive drugs. Because morbidity and mortality related to influenza are increased in immunocompromised patients, it is recommended that patients with SLE get annual flu shots, which are safe and do not increase disease activity.

Both antibody and cell-mediated responses are involved in the immune response to influenza; in SLE, antibody responses to the vaccine are diminished, but it is not known if the same effect is seen in cell-mediated responses. A new study was the first to examine cell-mediated responses in SLE patients prior to and following influenza vaccination. The study was published in the August issue of *Arthritis & Rheumatism*.

Led by Albert Holvast, of the University of Groningen in The Netherlands, the study involved 54 patients with SLE and 54 healthy controls who received subunit flu vaccine, out of a total of 78 patients in each group. Patients were randomized 2:1 to receive a flu vaccine or serve as a nonvaccinated control. Patients and controls were followed up at 28 days and three to four months following vaccination, at which time blood was drawn.

Vaccination induces an influenza virus-specific immune response which is generally documented as the generation of antibodies specifically reacting with the virus. However, the main defense against the virus is exerted by specific immune cells, in particular CD4+ and CD8+ T-cells

which are part of the immune response induced by vaccination. The level of this so-called cellular immune response has until now not been documented in patients with SLE, but is crucial for the effect of vaccination.

The results showed that cell-mediated responses (both CD4+ and CD8+ T-cells) to influenza were lower in SLE patients prior to vaccination. Following vaccination, cell-mediated responses remained lower in SLE patients than controls. CD4+ and CD8+ T-cell responses to staphylococcal enterotoxin B (SEB), which was used as a positive control, were normal in patients with SLE, indicating that their decreased cell-mediated response to the flu vaccine was not attributable to a decreased responsiveness of T cells in general. However, the use of the medications prednisone and/or azathioprine was associated with lower cell-mediated responses following vaccination.

Previous studies have shown that antibody production following flu vaccination is lower in SLE patients than in the general population and the current study confirmed these results. The authors evaluated the relationships between antibody and cell-mediated responses because CD4+ T-cell help is necessary for antibody responses. While they did not find a correlation between CD4+ T-cell and antibody responses using flow cytometry, they did find a modest correlation using ELISpot assay, a more sensitive technique. They also found that flu vaccination did not induce disease activity over three to four months.

Although the sample size in this study was not large, the authors conclude that the diminished cell-mediated immune and antibody responses to flu vaccination in SLE patients are representative of what occurs in daily practice. "Clinicians should be aware that this combined defect might increase the morbidity and mortality due to influenza virus infection, in particular in patients receiving prednisone and/or azathioprine," they state, adding that evaluating clinical protection

against influenza in SLE patients following vaccination may be warranted in order to assess whether more effective influenza vaccines or vaccination strategies are warranted.

More information: http://www.interscience.wiley.com/journal/arthritis

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