SOUTHWESTERN NEWS

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Allergies increase risk for corneal transplant rejection, UT Southwestern study shows

DALLAS – May 20, 2005 – Corneal transplant patients who suffer from eye allergies are at a significantly higher risk of transplant failure than those without allergies, UT Southwestern Medical Center researchers have shown.

"We found that the immune system's response to corneal transplants was profoundly elevated in mice with allergic eye disease, resulting in the rejection of 100 percent of the corneal grafts. This was in sharp contrast to the 50 percent rejection rate that occurred in the mice without allergic eye disease," said Dr. Jerry Niederkorn, professor of ophthalmology.

Results of the study, scheduled to go online today, will appear in the June issue of the *Journal of Immunology.*

"The study provides insights that might explain clinical observations that patients with eye allergies have a significantly higher risk for rejecting corneal transplants than patients without eye allergies," said Dr. Niederkorn, senior author of the study. "The allergist and ophthalmologist need to work as partners in managing the allergic patient who is destined to receive a corneal transplant."

The immune system is programmed to react to organ transplants by producing a specific pattern of proteins that promote a destructive immune response, which culminates in graft rejection. The immune system responds in a markedly different manner when confronted with allergens, producing an opposing pattern of proteins. Proteins associated with allergic responses are known to inhibit immune cells and thus, were previously believed to prevent graft rejection.

"In this study, however, the opposite was found to be true," Dr. Niederkorn said. "The presence of eye allergies altered the immune system's response to the corneal transplants in a manner that resembled a severe allergic response and culminated in a dramatic increase in corneal graft rejection."

Researchers applied ragweed pollen for several days to the right eyes of mice awaiting corneal transplantation, inducing allergic eye disease similar to that found in patients with ocular

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allergies. Another group of mice served as a control group, and corneal grafts were rejected in 50 percent of them; however, all of the grafts were rejected in mice with ocular ragweed allergy. The allergic mice also had a rejection rate twice as fast as the control group.

Researchers then performed additional experiments to determine if the increased graft rejection was simply due to the inflammation and irritation in the eye produced by the allergic response to ragweed pollen. In these experiments, ragweed pollen was applied to the right eye of the mice but the cornea was transplanted to the left eye, which was free of local allergic responses. All of the corneal transplants were still rejected.

"These findings demonstrate that the presence of eye allergies can have a profound effect on the immune system that reaches beyond the local site of an allergic response, in this case, the eye," Dr. Niederkorn said. "The results offer hope for improving the success of corneal transplants in patients with allergic eye diseases."

UT Southwestern ophthalmology researchers involved in the study included Dr. Clay Beauregard, postdoctoral research fellow and lead author; Elizabeth Mayhew, research scientist; and Christina Stevens, research assistant.

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