Fetal membrane transplantation prevents blindness

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Transplanting tissue from newborn fetal membranes prevents blindness in patients with a devastating disease called Stevens-Johnson syndrome, a Loyola University Medical Center study has found.

The study by senior author Charles Bouchard, MD, and colleagues is published online ahead of print in the journal *Cornea*.

Stevens-Johnson syndrome (SJS) is a disorder in which skin and mucous membranes, including the eye surface, react severely to a medication or infection. SJS causes painful skin blisters, and as the disease progress, the skin sloughs off as if the patient had been burned. A more severe form of the disease, involving more than 30 percent of the body surface, is called toxic epidermal necrolysis (TEN).

Between 50 percent and 81 percent of SJS/TEN patients experience eye problems, ranging from mild dry eye to severe scarring that can cause blindness.

Loyola researchers studied a relatively new eye treatment for SJS/TEN patients called amniotic membrane transplantation. Amniotic membrane is part of the fetal membranes that surround and protect the baby in the womb, and have natural therapeutic properties. When placed on the eye, amniotic membrane can help aid healing, decrease inflammation and minimize scarring. (Amniotic membrane is donated by a consenting mother following the birth of her baby.)

SJS/TEN has an earlier acute stage and a later chronic stage. Previous studies have found that amniotic membrane transplantation is effective in the chronic stage. The Loyola case-control study is one of the largest studies to examine the effect of amniotic membrane transplantation in the early, acute stage. The first case reported in a medical journal was done by a Loyola ophthalmologist, Dr. Thomas John.

Researchers examined the records of 128 SJS/TEN patients admitted to the Loyola University Medical Center Burn Intensive Care Unit from 1998 to 2010. Some patients died and others did not have adequate followup. Among the remaining patients, researchers compared recent patients with mild, moderate and severe disease who received amniotic membrane transplantation with similar patients who did not receive amniotic membrane treatment because it was not available at the time.

Thirteen of the recent patients underwent amniotic membrane transplantation on a total of 25 eyes during the early stage of the disease, and 17 patients (33 eyes) received standard medical management but no transplantation. After three months, only 4.3 percent of the eyes treated with amniotic membrane transplantation were legally blind (vision worse than 20/200 when corrected). By comparison, 35 percent of the eyes treated with medical management alone were legally blind.

Researchers wrote: "Our results support the use of early amniotic membrane transplantation, within the first three to five days, over the entire ocular surface. . . If the amniotic membrane is placed more than one week after the onset of the disease, the beneficial effects may be reduced."

Researchers are now examining the levels of a variety of inflammatory mediators in the skin, blood, eye and mouth in patients with SJS/TENS to better understand the cause of this devastating disease, and to develop better treatments.

Drs. Charles Bouchard and Amy Lin, MD, did the amniotic membrane transplants in the study. Bouchard is chairman and Lin is an assistant professor in the Department of Ophthalmology of Loyola University Chicago Stritch School of Medicine.

Co-authors of the study, all in Loyola's Department of Ophthalmology, are Maylon Hsu, MD, (first author), Anupam Jayaram, MD and Ruth Verner, BS.

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