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## New Test for Major Killer of Lung Transplant Patients: High Stem Cell Count After Transplant Predicts Debilitating Syndrome

*A lung transplant can mean a new chance at life. But many, who receive one develop a debilitating, fatal condition that causes scar tissue to build up in the lungs and chokes off the ability to breathe.*

University of Michigan researchers hope a new diagnostic tool they developed to predict bronchiolitis obliterans syndrome (BOS) will allow doctors to intervene earlier and, ultimately, to provide life-saving treatments.

BOS is the leading cause of death for those who survive one year after lung transplantation and more than half of recipients will develop BOS within five years. There is currently no cure.

Vibha Lama, M.D., M.S., an assistant professor of pulmonary and critical care medicine at the University of Michigan Medical School, led a team of U-M researchers who, recently discovered that patients who had a high number of stem cells in their lungs six months after transplantation were much more likely to develop BOS than those with lower counts.

"Our study provides the first indication of the important role these cells play in both human repair and disease," Lama says. "It's very important from the clinical perspective because we didn't previously have any strong biomarkers for BOS."

The findings were recently published online ahead of print publication in the American Journal of Respiratory and Critical Care Medicine.

The translational study also highlights the importance of the lab-to-bedside cooperation of basic and clinical research, Lama says.

While the exact relationship between the mesenchymal stromal cells and BOS remains unclear, doctors know that most of the cells originate with the donor and not the recipient. Spikes in cell counts are seen shortly after transplantation as the body responds to the injury; those levels usually taper off, but a second rise of cell counts after about six months is linked to a patient's likelihood of developing BOS.

In 2007, Lama and her colleagues published another discovery about the stem cells, revealing that the cells reside in the transplanted organs, independent of their more commonly known association with bone marrow. That study led to the further exploration of the cells' involvement with chronic transplant rejection.

The new findings also have the potential to spur research that will help people suffering from other types of lung disease, such as idiopathic pulmonary fibrosis, known as IPF.

Having the biomarker will also allow researchers to readily identify a population of patients ideal for testing new drug interventions and therapies.

"By the time we usually diagnose BOS, there's already been a huge decline in lung function," Lama says. "If we can find the disease early, we can potentially do something about it."

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