

# UIC-led clinical trial identifies patients at higher risk of second stroke

Sharon Parmet

Risk of recurrent stroke is higher in patients who have low blood flow to the back of the brain, a six-year, multi-center trial has found, and the condition can be visualized using specialized software developed at the University of Illinois at Chicago that analyzes blood flow using standard MRI.

Dr. Sepideh Amin-Hanjani, professor of neurological surgery at the UIC College of Medicine and principal investigator on the study, presented the results of the National Institutes of Health-sponsored Vertebrobasilar Flow Evaluation and Risk of Transient Ischemic Attack and Stroke (VERiTAS) trial at the International Stroke Conference in Nashville, Tennessee, on Feb. 12.

Patients with blockage of the blood vessels that supply blood to the back of the brain—a condition known as vertebrobasilar disease, or VBD—are at risk of having a stroke or temporary symptoms of a stroke known as transient ischemic attack (TIA). These posterior-circulation strokes account for 30 percent to 40 percent of all ischemic strokes, or about 200,000 cases per year in the U.S.

The risk of a repeat stroke associated with VBD may be tied to several factors, including the degree to which the blockage reduces the blood flow to the brain. Patients with VBD can have blockage ranging from partial to complete, which affects blood flow accordingly. Some patients with VBD can also have normal blood flow to the back of the brain.

The trial sought to identify patients with VBD and low blood flow to see if they had a higher risk of recurrent stroke than those with normal blood flow to the back of the brain. A quarter of the enrolled patients were identified as having low posterior blood flow.

“We found that patients with low blood flow had a 22 percent risk of recurrent stroke in the first 12 months, versus a 4 percent risk for patients whose blood flow was not low,” Hanjani said. At 24 months, the risk for patients with low blood flow was up to 30 percent versus 13 percent for other patients.

“The ultimate goal is to find what treatments might be most effective for each patient,” Hanjani said. “If you can establish that there is a proportion of people who have reduced blood flow, then you can consider them for treatments that might actually increase it—for example, [by] surgery or stents or other procedures that might open up the blood vessels,” he said.

“Just as importantly, if you find a group of people whose blood flow is not reduced,” Hanjani said, there would be no need to subject them to a procedure and its associated risks.

NOVA technology, a computer-based system used to visualize brain anatomy and quantify blood flow developed at UIC by Dr. Fady Charbel, professor and head of neurological surgery, made it possible to easily identify patients with reduced posterior blood flow using standard MRI. With help from the UIC Office of Technology Management, NOVA was transferred to a newly formed company, VasSol, Inc., where the technology was further developed into a product with an improved user interface, adding functionality and applicability.

“One of the distinct advantages of this technique is that it is based on technology that is widely available,” said



Hanjani. She and her colleagues hope that the ease of identifying the high-risk group will make further study of the condition easier and lead to better therapies.

Adult stroke patients were enrolled at five study sites: UIC, Washington University of St. Louis, University of California at Los Angeles, Columbia University in New York, or University of Toronto/Toronto Western Hospital. They were assessed for low posterior blood flow and followed for one to two years—an average of 22 months. All patients continued under the care of their neurologists and received standard care for their condition.

Drs. Dilip Pandey, Xinjian Du, DeJuran Richardson, Keith Thulborn, Victor Aletich and Linda Rose-Finnell of UIC; Dr. Mitch Elkind of Columbia University; Drs. Greg Zipfel and Colin Derdeyn of Washington University in St. Louis; Dr. David Liebeskind of the University of California, Los Angeles; Dr. Frank Silver of the University of Toronto; Dr. Scott Kasner of the University of Pennsylvania; Dr. Louis Caplan of Beth Israel Deaconess Hospital and Harvard Medical School; and Dr. Philip Gorelick of Michigan State University are co-authors on the abstract presented at the International Stroke Conference.

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Dr. Fady Charbel, professor and head of neurological surgery, UIC College of Medicine. Photo: Kathryn Marchetti.