

# MRI can help decide therapy in patients with unclear-onset stroke

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Among patients who have had strokes but aren't sure when symptoms began, magnetic resonance imaging (MRI) can help distinguish who might benefit from clot-busting drugs while facing acceptable risk, according to research presented at the American Stroke Association's International Stroke Conference 2011.

Researchers used MRI techniques to screen 430 patients with unclear-onset stroke at six university hospitals in South Korea. Strokes are categorized as unclear-onset, or "wake-up," strokes if patients or witnesses don't know when symptoms began, or woke up already in the throes of a stroke.

It is a key issue because clot-busting drugs have proven effective at reducing disability up to 4.5 hours after symptom onset.

"Wake-up, or unclear-onset, strokes account for a quarter of all ischemic strokes but have been automatically excluded from clot-busting techniques because the onset time cannot be known. Our study shows that such patients could also be treated safely and effectively," said Dong-Wha Kang, M.D., Ph.D., lead author and associate professor in the Department of Neurology at Asan Medical Center at the University of Ulsan College of Medicine in Seoul, South Korea.

All the patients arrived at one of six emergency rooms within six hours of detecting symptoms. Using diffusion-perfusion MRI, which shows tissue death and blood flow in the brain, the researchers looked for

sizable areas where tissue remained alive even though it lacked blood flow. To limit the risk of serious bleeding in the brain from clot-busting therapy, patients were excluded if they had extensive tissue death in the brain area supplied by a major artery, the [middle cerebral artery](#), or if other MRI techniques, such as those called FLAIR or T2, showed that the time of tissue death had elapsed.

More than 80 patients (median age 67 and classified as having severe stroke) were found eligible for clot-busting therapy, which included intravenous administration of the drug [tissue plasminogen activator](#) (tPA), direct administration of the drug urokinase – which is not available in the United States – to the blocked vessels in the brain or both. Some patients also had their clots removed mechanically or underwent stenting.

Among those who received the drug therapy, about 45 percent had at least a "good" clinical outcome—ranging from no symptoms to slight disability with curtailed activities—on the modified Rankin scale, which measures degree of impairment and its impact on stroke patients' daily activities. Almost 29 percent had an excellent clinical outcome, meaning they were able to carry out all their usual activities with little or no impairment.

A key limitation of the study is it didn't include a comparison group of patients who did not receive the clot busting treatment. Still, Kang said, "This study should trigger follow-up studies to develop the best available treatment strategies for this important but neglected group of stroke patients."

The study also found that female patients were likely to fare more poorly with treatment, as were patients who had a more severe initial assessment of their stroke impairment, and those treated at the two centers lacking previous experience in thrombolysis for unclear-onset

stroke.

Because researchers in the study treated patients with strokes of various origins, it's likely that the findings would also apply to non-Korean populations, said Kang. But patient outcomes are likely to vary among medical centers, due to the availability of MRI facilities as well as interventionists to deliver clot-busting drugs directly to the brain blood vessels.

This work received the Emergency Medicine Award from the International Stroke Conference committee – which recognizes outstanding research in the field by a young investigator.

The research team next plans to compare the outcomes from their study population with those of comparable but untreated patients listed in stroke registries. "Although this study provides some important clues to treat wake-up, or unclear-onset, stroke patients, we still have a long way to go to find the best way to treat them," Kang said.

Provided by American Heart Association

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