The trouble with post-stroke cognitive impairment
by Russell Chander, Clinical Research Coordinator, Department of Neurology, National Neuroscience Institute Singapore

It has been estimated that about one in 25 adults above the age of 50 years in Singapore will have a stroke in their lifetime. It is a significant public health issue both here and globally, even for non-disabling ischemic strokes. In these non-disabling strokes, survivors have a good chance of physical recovery and will undoubtedly be keen on returning to their everyday lives, the sooner the better.

One outcome of stroke that can get in the way of recovery is post-stroke cognitive impairment (PSCI); the development of cognitive impairments (anywhere from mild impairments to full-blown dementia) that happen after and due to a stroke. Even if one recovers enough and is able to return to work, PSCI may slowly but surely impair one’s ability to do so, especially if it is unchecked and uncontrolled.

If we can identify stroke patients at risk of developing PSCI, they could choose to start therapy and/or medication to prevent the onset of PSCI, or to start managing it from an early stage. This is slowly becoming more viable as we uncover more evidence for medications being effective in controlling or preventing PSCI.

Unfortunately, accurately identifying at-risk people can be tricky. For one, PSCI may kick in only days or weeks after a stroke, so a patient that has recovered and been discharged well might still have some risk of developing PSCI later. Another issue is that people having a stroke may experience confusion for a couple of days, making cognitive testing at the time of stroke somewhat unreliable.

Our Neurocognition and Memory Disorders research team at National Neuroscience Institute (NNI), led by A/Prof Nagaendran Kandiah, realised that assessing if a stroke survivor will develop PSCI in the future takes more than just observing how they recover.
We decided that a prediction score for clinical use was needed to accomplish this. This risk score would need to: 1) predict PSCI based on known risk factors, 2) use information readily available to clinicians, 3) be easy to use, and 4) be validated by real data. We started by using data from a clinical stroke database to identify which factors could best distinguish between people with and without PSCI, amongst stroke survivors who did not have any impairments before their stroke. In order to make it easy to use, we narrowed them down to the best few variables and only used data that was available during the stroke admission. Once we had the prediction scale, complete with a scoring system based on each variable’s odds ratios, we tested it out on a separate stroke database here, and it worked well in both datasets.

We were heartened by the results and performance of the scale, but knew that it required further validation in an external cohort of patients. We worked with our collaborators in The Chinese University of Hong Kong to validate the score in their cohorts. It was here that we realised another issue that had to be rectified: the scale had to be useable by as many stroke centres around the world as possible, not just in Singapore. Certain tests that we do more commonly here, like magnetic resonance angiography, may not be available in certain centres, which makes the risk score unusable for them. After we amended it accordingly, we had the final version of the scale that used a patient’s age, education level, brain atrophy, location of large new strokes, number of old strokes, and white matter disease, to assess a stroke survivor’s risk of PSCI within 18 months of a stroke at 73 per cent accuracy.
Our team was confident in our findings enough for us to present the new scale at the 2016 SingHealth Duke-NUS Scientific Congress. Of course, our work does not stop there, and we aim to push this scale out to as many stroke centres as possible. We believe that this risk score will help stroke teams streamline their patient management workflows, and help them to identify otherwise undetected patients at risk for PSCI.

REFERENCES

About the Author
Russell Chander is a Clinical Research Coordinator with A/Prof Nagaendran Kandiah at the National Neuroscience Institute, Singapore. Their team is currently working with people with cognitive impairment of the vascular and Alzheimer’s type. His main research focus is identifying useful in vivo biomarkers for early detection and prognostic prediction of neurocognitive disorders.

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