

Profile

Ka Sing Lawrence Wong: unlocking the causes of stroke in Asia



"The signals are amazing", says Ka Sing Lawrence Wong, chief neurologist at the Prince of Wales Hospital, Chinese University of Hong Kong, referring to ultrasound imaging signals derived from blood flowing through plaques in the brain. "They look like firecrackers showering down a string." After having monitored many Asian patients with stroke in real time by use of transcranial Doppler imaging, it occurred to Wong that the plaques in blood vessels in the brain, or intracranial atherosclerosis, might be the cause of stroke in those patients.

A native of Hong Kong, Wong became fascinated by stroke during his neurology training because it was very much a neglected disease at the time. "There were numerous stroke sufferers worldwide, but we had little understanding of it let alone effective treatments, especially in Asian populations", he says. A serendipitous meeting with Louis Caplan, a prominent neurologist at Harvard Medical School in Boston, USA, in 1990, afforded him a pivotal insight into the diverse haemodynamic mechanisms underlying stroke.

"That was a turning point in my career", recalls Wong. At the time, stroke was thought to be mainly caused by blockage of the middle cerebral artery due to clots originating from the carotid artery and cardiac chambers—a conclusion based on studies of white people in Europe and the USA. "Could Asian populations have different predispositions to stroke?", he wondered. There had already been indications that Asian populations might be more prone to intracranial atherosclerosis, but direct evidence was lacking.

Over the years, Wong and his colleagues have used various non-invasive imaging tools, such as transcranial Doppler ultrasound, MRI, and CT, to study patients with stroke, and have established that intracranial atherosclerosis is the most common lesion in the Chinese population. They also screened nearly 600 asymptomatic residents aged 40 years or older in a village in central China—more than 90% of the village's population—and found that people with intracranial atherosclerosis were more likely to develop a stroke than those without the condition. The researchers also found that the risk was associated with the number of vessels involved and the additional presence of extracranial disease.

This study was one of the first in the world of intracranial atherosclerosis in populations at an asymptomatic stage. Further research has since shown that the risk of developing a stroke among asymptomatic populations with the artery disease is about 1–2% within the first year of diagnosis; it rises to 10–20% in patients who have already had a stroke. The findings have stimulated similar work in other Asian countries, such as Korea, Thailand, Singapore, and India, as well as in African and Hispanic populations, which have all come to the same conclusion.

"So intracranial atherosclerosis is a common cause of stroke in the majority of the world's population except in white people", says Wong. Other risk factors for stroke, such as hypertension and diabetes, are common in all races and ethnicities. Why aren't white people prone to intracranial atherosclerosis? "This is the million-dollar question in the field of stroke susceptibility", he says. Wong suspects that white individuals might not have some of the genetic predisposing factors that affect intracranial arteries. "Ultimately, it may be a result of an interplay between genetics, lifestyle, and environmental factors", he adds.

The ability of non-invasive imaging techniques to visualise intracranial arteries highlights their value in diagnosing and monitoring embolism development. "This has important implications for identifying high-risk populations and for treating and preventing stroke in those people", says Wong. In the past few years, Wong and his colleagues have been trying to develop strategies to treat intracranial atherosclerosis. They found that, despite hypertension and lipid-reducing treatments, usual strategies for tackling stroke, patients continued to have high rates of recurrence of stroke.

In the past few years, the researchers have been testing whether treatments using different antithrombotic drugs could improve the outcome of patients with stroke. They found that a subgroup of patients with intracranial atherosclerosis were responsive to heparin in a secondary outcome measure compared with those with no abnormality in intracerebral arteries.

The team has just completed a multicentre, international trial testing whether the use of a different combination of antiplatelet drugs could have further improvements. The researchers closely monitored more than 100 Asian patients with intracranial atherosclerosis and assessed whether the number of plaques in the arteries could be reduced by the treatment. Wong is keeping the outcome of the trial under wraps as the results have not yet been published.

In addition to research and treating patients, Wong now devotes a large part of his time to teaching, particularly training medical students and neurologists from mainland China. "The most important thing for me at the moment is to educate the next generation of clinicians", he says. There are millions of new cases of stroke in China every year, but the prevention and treatment of the disease is not yet up to scratch, particularly in rural areas. "The standard is gradually improving", says Wong. "Fighting against stroke is a long-term battle and requires the continuous efforts of several generations."

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For more on the **study on response to heparin** see *Lancet Neurol* 2007; **6**: 407–13

For more on **intracranial atherosclerosis in the Chinese population** see *Neurology* 2007; **68**: 2031–34

For more on the **results of the study in the Chinese village** see *Stroke* 2003; **34**: 2361–66