

## STROKE

## Retinal changes predict subsequent vascular events in ischemic stroke

Changes in retinal microvasculature can predict recurrent vascular events in patients after ischemic stroke, according to a recent study published in *Neurology*.

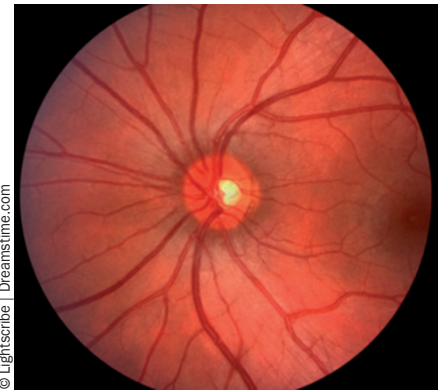
Improvements in acute care of patients with stroke have resulted in decreased mortality; however survivors are at risk of recurrent vascular events. Retinal imaging is a noninvasive technique that can be used to identify changes in retinal microvasculature. Signs of microvascular changes in the retina have been found following cerebrovascular events (such as stroke) in healthy populations. As retinal microvasculature has a common arterial supply and many similar features to brain microvasculature, identifying changes in the retina could provide prognostic information about cerebrovascular events.

“The primary aim of this study was to investigate retinal microvascular changes in relation to small-artery stroke,” explains Deidre De Silva, lead investigator of the study, which was performed as part of a collaborative research project: the Multicenter Retinal Stroke study. “We then planned post-hoc analyses to study whether retinal changes predicted subsequent vascular events following stroke.”

The researchers recruited patients with ischemic stroke who had been admitted to Singapore General Hospital. Retinal images were taken within 1 week of stroke onset and subsequently analyzed for vascular changes. Follow-up data were obtained from 652 patients over a mean period of 29 months to determine the incidence of recurrent stroke, subsequent myocardial infarction, and death due to a vascular cause.

“Severe retinal arteriovenous nicking (AVN) was independently associated with a higher likelihood of recurrent stroke,” says De Silva. “Retinal focal arteriolar narrowing (FAN) was independently associated with recurrent stroke and subsequent composite vascular events.” Severe AVN and severe FAN were predictors of recurrent cerebrovascular events in ischemic stroke patients, with hazard ratios of 2.28 and 2.75, respectively.

“This is the first study describing the association of retinal changes to vascular events in a poststroke cohort,” states De Silva. Her research group is currently analyzing data on novel retinal findings—such as geometric complexity, branching and tortuosity of retinal



© Lightscribe | Dreamstime.com

vessels—as predictors of subsequent vascular events. Furthermore, they plan to extend follow-up of patients from the current study to determine whether retinal changes are associated with vascular events at 10 years after ischemic stroke.

The study by De Silva *et al.* shows that retinal microvascular changes may be useful as prognostic markers following ischemic stroke. “The study of retinal changes may also improve the understanding of novel vascular risk factors and stroke pathophysiology, particularly for small-artery stroke,” concludes De Silva.

*Katy Malpass*

**Original article** De Silva, D. A. *et al.* Retinal microvascular changes and subsequent vascular events after ischemic stroke. *Neurology* 77, 896–903 (2011)