

# Retinal Microvascular Abnormalities, Cardiovascular Mortality Linked

Future computer technology may be able to noninvasively predict target organ damage and cardiovascular risk.

REVIEWED BY ALUN D. HUGHES, MBBS, PhD, BSc

**A**bnormalities in the retinal microvasculature are found in hypertension as well as diabetes and predict death from ischemic heart disease and stroke.

According to a report in *Hypertension*, a detailed assessment of the retina microvascular network — from digitized photographs — may be useful in the noninvasive assessment of target organ damage and cardiovascular risk.

## DATA FROM BEAVER DAM

In their study, Alun D. Hughes, MBBS, PhD, BSc, and colleagues from the Imperial College of London and the University of Wisconsin examined this relationship. They used a population-based nested case-control investigation from within the Beaver Dam Eye Study. The investigators matched patients aged 43 to 74 years who died from ischemic heart disease (n=126) or stroke (n=28) over a 10-year period with control patients (n=528).

All patients — cases and controls — had retinal photographs taken. The retinal photographs were digitized and analyzed using a computer-based technique, Professor Hughes said. The increased risk of death from ischemic heart disease was associated with a suboptimal relationship of arteriolar diameters at bifurcation ( $P=.02$  unadjusted) and decreased retinal arteriolar tortuosity ( $P=.011$  unadjusted). The investigators wrote that these associations remained significant, even after adjustment for age, sex, past history of cardiovascular disease and

other known cardiovascular risk factors.

“Increased arteriolar length:diameter ratio, a measure of generalized arteriolar narrowing, was associated with increased stroke mortality ( $P=.02$  unadjusted),” Professor Hughes wrote. “This association was independent of age and gender but was attenuated by adjustment for systolic blood pressure.

## ADDITIONAL FINDINGS

Other quantitative measures of the retinal microvascular network, such as venular tortuosity and arteriolar and venular bifurcation angle, were not associated with ischemic heart disease death or stroke death.

In an interview with Reuters Health, Professor Hughes concluded that “in future, computerized assessment of the retinal microvascular network may be useful in the noninvasive assessment of target organ damage and cardiovascular risk.” ■

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Witt N, Wong TY, Hughes AD, et al. Abnormalities of retinal microvascular structure and risk of mortality from ischemic heart disease and stroke. *Hypertension*. 2006;47:975-981.