

Retinal Vascular Geometry in Asian Persons with Diabetes and Retinopathy

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Abstract

Purpose:

Our purpose was to examine the relationship of retinal vascular parameters with diabetes and retinopathy in an older Asian population.

Methods:

Retinal photographs from participants of a population-based survey of Asian Malay persons aged 40–80 years were analyzed. Specific retinal vascular parameters (tortuosity, branching angle, fractal dimension, and caliber) were measured using a semiautomated computer-based program. Diabetes was defined as random plasma glucose ≥ 11.1 mmol/liter, the use of diabetes medication, or physician-diagnosed diabetes. Retinopathy signs were graded from photographs using the modified Airlie House classification system.

Results:

A total of 2735 persons were included in the study. Persons with diabetes ($n = 594$) were more likely to have straighter (less tortuous) arterioles and wider arteriolar and venular caliber than those without diabetes ($n = 2141$). Among subjects with diabetes, those with retinopathy had wider venular caliber than those without retinopathy (211.3 versus 204.9 μm , $p = .001$). Among nondiabetic subjects, however, those with retinopathy had more tortuous venules than those without retinopathy [$5.19(\times 10^4)$ versus $4.27(\times 10^4)$, $p < .001$].

Conclusions:

Retinal vascular parameters varied by diabetes and retinopathy status in this older Asian cohort. Our findings suggest that subtle alterations in retinal vascular architecture are influenced by diabetes.

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Abbreviations: (BMI) body mass index, (CI) confidence interval, (DR) diabetic retinopathy, (HbA1c) glycated hemoglobin, (SIVA) Singapore I Vessel Assessment

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