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(×10^4) versus 4.27(×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.