Is the Microdensitometric Method a New Gold Standard for Retinal Arteriolar Narrowing Detection?

Fotis Topouzis

In their report, Maestri et al. investigated the performance of direct ophthalmoscopy to detect narrowing of retinal arterioles. They found that the performance of internists and ophthalmologists to detect retinal arteriolar narrowing (RAN) based on arteriolar-to-venous ratio (AVR) is low compared with the performance of the microdensitometric method. This is not surprising, as it is well known that the sensitivity of direct ophthalmoscopy to detect signs of early retinal microangiopathy is poor compared with retinal photographs. Furthermore, the microdensitometric method performs even better compared with standardized retinal photographs grading. Does this mean that the microdensitometric method is the new gold standard for RAN detection?

This study showed superiority of the microdensitometric method compared with direct ophthalmoscopy, which, however, is not the actual gold standard.

In their previous study, the investigators compared the microdensitometric with the micrometric method, which is a well-accepted method of retinal photo grading for microvascular abnormalities associated with hypertension. They reported a very high sensitivity but a very low specificity in detecting RAN with the microdensitometric method when the micrometric method was used as the gold standard. This may indicate that the microdensitometric method is either more sensitive to detect RAN or that it overdetects RAN. This needs further research and validation. Interestingly, the investigators reported very high intraobserver and interobserver agreement with the microdensitometric method, which means low observer dependence.

In the present study the investigators decided to use an AVR of 0.67 to denote generalized RAN. Their decision was based on data from their previous study, where an AVR of 0.67 corresponded to the 75th percentile of the AVR distribution as measured by the microdensitometric method. However, this study was not population-based and included only a small sample of selected hypertensive patients. Furthermore, the median AVR was reported as 0.84 in large population-based studies. More data from large population-based cohorts are needed to establish cutoff for normality. In addition, an AVR severity scale for RAN may be established through large population-based cohorts. A potential limitation of the proposed microdensitometric method is that, although it detects generalized RAN, it does not detect focal RAN, which has been found in 7% of participants in population-based studies. Also, there is no separate consideration of arterioles and venules, whereas the use of AVR as a parameter of RAN should take into account conditions associated with larger venular diameters. Another possible limitation, which has not been addressed by the present study, is whether ocular media clarity would affect the performance of the microdensitometric method. The prevalence of cataract and other causes of hazy media are high, especially in the elderly.

Now back to the question at hand: is the microdensitometric method a new gold standard for RAN detection? Based on the actual status of knowledge we can say that it is a promising method but not yet established as the gold standard. It provides certain advantages of high reproducibility and low observer dependence. However, further research is needed to evaluate its sensitivity and specificity in detecting RAN, and the cutoff point for normality needs reconsideration and validation based on large population-based studies.

References


From the II Department of Ophthalmology, Aristotle University of Thessaloniki, Thessaloniki, Greece.

Address correspondence and reprint requests to Dr. Fotis Topouzis, Aristotle University of Thessaloniki, II Department of Ophthalmology, General Hospital Papageorgiou, Periferiaki Odos Thessalonikis, N. Efkarpi 56403, Thessaloniki, Greece; e-mail: ftopouzis@otenet.gr


October 10–13, 2007. Second Joint Meeting of the European Federation of Autonomic Societies & American Autonomic Society will be held in Vienna, Austria. Congress Office: Vienna Medical Academy, Alser Straße 4, A-1090 Vienna, Austria, Phone: 43-1-4051383-12, Fax: 43-1-4078274, E-mail: efas2007@efasweb.com, Website: www.efasweb.com/2007. Deadline for abstract submission is June 1, 2007.