CORRESPONDENCE

Ocular Defects as Surrogate End-Points in Trials Comparing Carotid Endarterectomy and Stenting

The effect of carotid endarterectomy (CEA) and carotid artery stenting (CAS) on visual function has not been a specific end-point of most trials comparing CAS and CEA. Ischaemic lesions of the retina and optic nerve have been reported to occur in 15—46% of carotid patients,[1] while carotid artery stenosis significantly reduces blood flow to the eye and orbit, resulting in the ocular ischaemic syndrome.[2—5]

Both CAS and CEA have been reported to prevent further episodes of amaurosis fugax, correct paresis of the pupil muscle, decrease neovascularization of the optic nerve head and iris, and improve blood flow to the orbital vessels.[1—5] However, emboli generated during CAS and CEA may also cause ischaemic lesions of the ophthalmic artery, leading to transient or permanent blindness.[6,7] Ophthalmic artery colour Doppler flow imaging, fluorescein angiography, and retinal photography have been used to detect new emboli generated during the carotid revascularization procedures.[6]

CAS is associated with a higher incidence of cerebral microemboli compared with CEA.[8—10] These microemboli are major risk factors for postprocedural cerebral deficits.[8—10] Although most of these microembolic events are not associated with deterioration in cognitive performance and functions, or may only be associated with a transient dysfunction, their long-term effects are uncertain.[11] It has been suggested that subclinical infarcts on magnetic resonance imaging (MRI) are a risk factor for cognitive impairment.[12] Furthermore, such microemboli may contribute to cognitive decline, vascular dementia, and Alzheimer's disease,[13,14] and may be associated with a higher (greater than threefold) risk of future stroke.[15] Therefore, long-term follow-up with neurocognitive testing and repeated MRI imaging may be essential to provide better insight into the nature of these lesions.[9,10]

Although much attention has been given to the effects of CAS and CEA on brain circulation, the effects of CAS versus CEA on visual function are unknown. Improvement in blood flow following CEA/CAS can improve chronic ischaemia of the orbital vessels but, on the other hand, it may turn out that microemboli generated during CAS and/or CEA adversely affect visual function. Current or future trials comparing CAS and CEA may, therefore, provide a unique opportunity to investigate and report on this subject.

The Asymptomatic Carotid Surgery Trial-2 (ACST-2) is currently the largest trial to compare CAS with CEA in patients with severe asymptomatic carotid stenosis.[16] Thus, it may represent a unique opportunity to investigate the effects of both procedures on the eye circulation and the retina. Potential differences between the two procedures may be used as another surrogate end-point on which the merits of each procedure could be judged. Finally, these results could provide additional useful data on the effects of carotid revascularization procedures in asymptomatic patients.

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