CORRESPONDENCE

Reading Beyond the Headlines

The European Society for Vascular Surgery (ESVS) guidelines on the management of carotid disease advise that carotid endarterectomy (CEA) should be performed as soon as possible, and preferably within 14 days of symptom onset.[1] There has, however, been controversy as to whether intervening within 48 h of symptom onset is associated with an excessive risk of peri-operative stroke/death.[2] In a recently published meta-analysis, Milgrom et al. concluded that urgent carotid interventions (performed within 48 h of symptom onset) were associated with significantly higher rates of peri-operative ipsilateral stroke, than when carotid interventions were performed after more than 48 h.[3] This meta-analysis could have important implications for future clinical practice, but a number of important issues must be clarified before that can happen.

In Milgrom's meta-analysis, the primary endpoint was "ipsilateral" stroke within 30 days of CEA. None of the secondary endpoints included 30 day rates of "any stroke." Only 13 references were ultimately included in the meta-analysis. However, two important and very large national registries that published procedural stroke rates stratified for delay to CEA were not included (the UK CEA audit[4] [$n = 23,235$] and the German National CEA audit[5] [$n = 56,336$]). The 30 day rates of "any" stroke for these 79,571 patients are detailed in Table 1. As can be seen, the 30 day rates of "any" stroke, when CEA was performed within 48 h, were $\leq$3%.

One possible explanation for their exclusion from Milgrom's meta-analysis was because these national audits did not report 30 day rates of "ipsilateral" stroke. However, comparative scrutiny of Milgrom's data published in their forest plot (Fig. 2A) against the data in the constituent papers, shows that they actually used 30 day data for "any" stroke (rather than ipsilateral stroke) in nine of the 13 studies. In one or two of these studies, ipsilateral stroke data were actually available, but in the majority, the constituent papers did not publish any data regarding ipsilateral stroke. In addition, and somewhat puzzlingly, Azzini's study reported no peri-operative strokes in any of their patients. However, the meta-analysis reported that stroke complicated two of 22 patients undergoing CEA within 48 h and one of 12 patients undergoing CEA after more than 48 h.[6] Finally, meaningful interpretation of these data is significantly confounded by the inclusion of large scale registry data, along with very small series detailing outcomes in patients with stroke in evolution, crescendo TIAs, those who received intravenous thrombolysis and the safety of carotid artery stenting in patients with intraluminal thrombus.

In retrospect, it probably would have been better if the authors had simply used 30 day rates of "any" stroke (stratified for delay to surgery), as there are many more published studies that could have enabled a more robust statistical analysis, including the 79,571 patients in the UK and German registries. Had this been the case, I suspect the final conclusions may have been slightly different.

Table 1. Thirty day rates of "any" stroke after carotid endarterectomy (CEA), stratified for delays from symptom to surgery in the UK and German National CEA Audits

	0–2 days	3–7 days	8–14 days	>15 days
UK Audit[4]	3.1%	2.0%	1.7%	1.8%
German Audit[5]	2.1%	1.6%	1.8%	1.0%

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