Urgent carotid surgery in patients with crescendo transient ischaemic attacks and stroke-in-evolution: a systematic review

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CRD summary
This review assessed stroke, cardiovascular and mortality outcomes following urgent carotid surgery in patients with crescendo transient ischaemic attacks or stroke-in-evolution. The authors concluded that the risk of such outcomes was higher than following elective surgery for stable symptoms. As the review did not compare the two types of surgery, the reliability of the authors' conclusion cannot be assessed.

Authors' objectives
To assess outcomes following urgent carotid surgery in patients with crescendo transient ischaemic attacks and stroke-in-evolution.

Searching
MEDLINE and EMBASE databases were searched from January 1984 to December 2007. Search terms were reported. References of identified studies and relevant reviews and meta-analyses were also checked. Only studies reported in English were eligible for inclusion.

Study selection
Studies which reported outcome data for urgent carotid surgery in neurologically unstable patients presenting with crescendo transient ischaemic attacks and stroke-in-evolution were eligible for inclusion. Relevant outcomes were stroke, mortality and cardiac complications. Studies in which data from patients with crescendo transient ischaemic attacks, stroke-in-evolution and other urgent indications could not be separately extracted were excluded.

All included studies were case series. A majority of patients with both indications for surgery were male and had average ages of 64 (crescendo transient ischaemic attacks) and 66 (stroke-in-evolution). Most patients in both groups underwent carotid endarterectomy. In-hospital or 30-day mortality was reported depending on available data.

Two reviewers independently assessed the studies for inclusion in the review; differences were resolved through consensus.

Assessment of study quality
The validity assessment focused on the studies' potential for information or selection biases and their use of multivariable corrections for comorbidities or case mix. Selection and information biases were each graded as "yes", "no" or "unclear".

The authors did not state how many reviewers performed the validity assessment.

Data extraction
Data were extracted into a spreadsheet.

Two reviewers independently extracted data; differences were resolved through consensus.

Methods of synthesis
Pooled proportions with 95% confidence intervals (CI) were calculated for each outcome. Statistical heterogeneity was assessed using Cochran's Q statistic and, where detected, a DerSimonian and Laird random-effects model was planned for the analysis.
Results of the review
Twenty-one studies were included in the review. A case series from the authors’ own institution was included. Twelve studies included patients with crescendo transient ischaemic attacks, and 16 included patients with stroke-in-evolution. The methodological quality was considered poor.

Crescendo transient ischaemic attacks (n=176 patients): The pooled perioperative stroke rate was 6.5% (95% CI 3.4 to 10.4); the pooled combined stroke/death rate was 9.0% (95% CI 4.3 to 15.1); and the pooled combined stroke/death/major cardiac event was 10.9% (95% CI 5.5 to 17.9).

Stroke-in-evolution (n=114 patients): The pooled perioperative stroke rate was 16.9% (95% CI 9.2 to 26.2); the pooled combined stroke/death rate was 20.0% (95% CI 12.5 to 28.6); and the pooled combined stroke/death/major cardiac event was 20.8% (95% CI 13.2 to 29.6).

All analyses for both groups of patients used a random-effects model, although statistically significant heterogeneity was not detected. This was due to the presence of selection bias in the majority of included studies.

Authors’ conclusions
The combined risk of neurological and cardiac complications following urgent carotid surgery for unstable neurological symptoms, such as crescendo transient ischaemic attacks and stroke-in-evolution, was higher than anticipated after elective surgery for stable symptoms.

CRD commentary
The review question and the inclusion criteria were reasonably clear. The authors searched two relevant databases, but did not report a systematic search for unpublished studies. This, together with the restriction of the review to studies published in English, may have led to the omission of relevant studies and the potential for publication and/or language biases. The authors reported using methods designed to reduce reviewer bias and error in the selection of studies and in the data extraction, but not in the validity assessment.

Given that the included studies were case series, the criteria used for the assessment of validity were reasonable. The statistical synthesis was reasonable.

The authors’ conclusion did not directly relate to the results of the review, which did not include a comparison of urgent surgery with surgery for stable symptoms, so its reliability cannot be assessed.

Implications of the review for practice and research
The authors did not state any implications for practice or further research.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.