A systematic comparison of the risks of stroke and death due to carotid endarterectomy for symptomatic and asymptomatic stenosis

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Authors' objectives
To review the risks of stroke and death due to carotid endarterectomy for symptomatic and asymptomatic stenosis.

Searching
MEDLINE was searched from 1980 onwards using the search terms 'carotid endarterectomy' and 'carotid surgery'. The Cochrane Stroke Group's Specialised Register and the reference lists of all identified articles were also searched.

Study selection
Study designs of evaluations included in the review
Any study reporting the risks of stroke and death within 30 days of carotid endarterectomy (or similar time period) performed for symptomatic or asymptomatic stenosis. The risks for the two patient groups had to be reported separately for the study to be included.

Specific interventions included in the review
Carotid endarterectomy for symptomatic and asymptomatic stenosis.

Participants included in the review
Patients with symptomatic or asymptomatic stenosis were included.

Outcomes assessed in the review
The outcomes were mortality and the risk of stroke and/or death.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection. However, the review was restricted to studies reporting the results of surgery for symptomatic and asymptomatic stenosis performed by the same surgeons, or in the same institutions.

Assessment of study quality
The authors do not state that they assessed validity.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the authors performed the data extraction.

Methods of synthesis
How were the studies combined?
The 95% confidence intervals (CIs) of the absolute risks of death, fatal stroke, and stroke and/or death were calculated using an extrabinomial method to account for any heterogeneity of risk among the individual studies. The overall odds ratios (ORs) for death, fatal stroke, and stroke and/or death due to endarterectomy for asymptomatic versus symptomatic stenosis were calculated using the Mantel-Haenszel method.

How were differences between studies investigated?
A chi-squared test of heterogeneity was carried out.
Results of the review
Twenty-five studies reporting 3,139 operations for asymptomatic stenosis and 11,917 operations for symptomatic stenosis were included.

There were 33 deaths (1.31%, 95% CI: 0.80, 1.78) attributed to endarterectomy for asymptomatic stenosis and 172 deaths (1.81%, 95% CI: 1.46, 2.13) attributed to surgery for symptomatic stenosis (OR 0.69, 95% CI: 0.49, 0.99). The relative OR of death after surgery for asymptomatic versus symptomatic stenosis showed no statistically-significant heterogeneity between studies.

Two studies gave no information on the causes of death. Among the remainder, the risks of non-stroke death were 0.81% (95% CI: 0.48, 2.25) and 0.81% (95% CI: 0.60, 0.99) after surgery for asymptomatic and symptomatic stenosis, respectively.

The risk of fatal stroke was 0.47% (95% CI: 0.20, 0.79) and 0.91% (95% CI: 0.51, 1.14) for asymptomatic and symptomatic stenosis, respectively, and the OR was 0.57 (95% CI: 0.38, 0.98).

The overall risks of stroke and/or death were 3.35% (95% CI: 2.38, 4.31) for asymptomatic stenosis and 5.18% (95% CI: 4.30, 6.06) for symptomatic stenosis, and the OR was 0.61 (95% CI: 0.51, 0.74). There was no significant heterogeneity between studies in the relative odds of stroke and/or death after surgery for asymptomatic and symptomatic stenosis.

Authors’ conclusions
The mortality and risk of stroke and/or death due to carotid endarterectomy performed by the same surgeons, or in the same institutions, are approximately 40% lower for asymptomatic stenosis than symptomatic stenosis.

CRD commentary
The search strategy is limited by the fact that no attempt was made to identify unpublished data. It is unclear whether non-English language articles were included in the review. The review could have been enhanced by a description of how inclusion criteria were applied, greater detail of the primary studies, and a validity assessment.

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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.