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Local Versus General Anaesthetic for Carotid Endarterectomy

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Carotid endarterectomy (CEA) markedly reduces the risk of stroke in people with recently symptomatic 70% to 99% carotid artery stenosis and to a lesser extent in people with 50% to 69% stenosis. However, benefit is dependent on maintaining a low operative risk, which may depend to some extent on the type of anesthetic used. Nonrandomized comparisons suggest that CEA under local anesthesia (LA) is associated with a lower operative risk of stroke and death than CEA under general anesthesia (GA), but such data are potentially unreliable and randomized studies are required.

Objectives

The aim of this review was to assess the operative risks of CEA under LA compared with CEA under GA.

Search Strategy

Two reviewers independently searched MEDLINE (1966 to April 2003), EMBASE (1980 to 2002), and Index to Scientific and Technical Proceedings (1980 to 1994). We also searched the Stroke Group trials register (April 2003), hand-searched 13 relevant journals up to 2002, and searched the reference lists of articles identified. We also advertised the review in Vascular News in August 2001.

Selection Criteria

Criteria included randomized trials and nonrandomized studies comparing CEA under LA versus GA.

Data Collection and Analysis

One reviewer selected studies for inclusion and another independently checked the decisions. Two reviewers assessed trial quality and independently extracted the data.

Main Results

Seven randomized trials involving 554 operations and 41 nonrandomized studies involving 25 622 operations were included. Eleven of the nonrandomized studies were prospective and 29 reported on a consecutive series of patients, but the methodological quality of many of the nonrandomized trials was questionable. In 9 nonrandomized studies, the number of arteries, as opposed to the number of patients, was unclear. Meta-analysis of the nonrandomized studies showed that the use of local anesthetic was associated with significant reductions in the odds of death (35 studies), stroke (31 studies), stroke or death (26 studies), myocardial infarction (22 studies), and pulmonary complications (7 studies), within 30 days of the operation.

Pooled Absolute Risks and Odds of Complications After CEA From 7 Randomized Trials of CEA Performed Under LA vs GA

Outcome	LA	GA	OR	95% CI	Heterogeneity, <i>P</i>
	Event/Operation	Event/Operation			
All deaths	1/280	6/274	0.23	0.05–1.02	0.7
Stroke	6/280	6/274	1.01	0.32–3.18	0.2
Stroke and death	7/280	11/274	0.63	0.25–1.62	0.3
MI	4/280	5/274	0.77	0.21–2.88	0.6
Local hemorrhage	4/223	14/221	0.31	0.12–0.79	0.6
Nerve injury	4/167	2/166	1.98	0.39–9.97	0.2
Artery shunted	56/223	60/221	0.68	0.40–1.14	<0.0001

Odds ratios were calculated by the standard Peto method.

Heterogeneity of estimates between studies was calculated by the χ^2 method.

CI indicates confidence interval; MI, myocardial infarction; OR, odds ratio.

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Meta-analysis of the 7 randomized studies revealed a nonsignificant trend toward a reduced mortality within 30 days of the operation with LA (pooled OR, 0.23; 95% CI, 0.05 to 1.02), but this estimate was based on a very small number of events (Table). LA was, however, associated with a more convincing reduction in local postoperative hemorrhage (OR, 0.31; 95% CI, 0.12 to 0.79) within 30 days of the operation. There was no evidence of a difference in the odds of operative stroke.

Implications for Practice

There is insufficient evidence from randomized trials comparing CEA performed under LA versus GA to allow reliable conclusions to be drawn. Nonrandomized studies suggest

potential benefits with the use of local anesthetic, but these studies may be biased.

Implications for Research

More randomized studies are needed to compare CEA performed under LA versus GA. A large randomized trial (GALA) is currently ongoing and has randomized >1000 patients so far.

Note: The full text of this review is available in the Cochrane Library (for subscribers: www.update-software.com/Cochrane). The full article should be cited as: Rerkasem K, Bond R, Rothwell PM. Local versus general anaesthetic for carotid endarterectomy (Cochrane Review). In: *The Cochrane Library*. Issue 2, 2004 Oxford: Update Software. 227 Cochrane Library, John Wiley & Sons Ltd.