

Local versus general anaesthetic for carotid endarterectomy

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Key words: carotid endarterectomy, prevention, stroke, anaesthetic

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

Randomised trials and non-randomised studies comparing CEA under LA versus GA.

Data collection & 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 randomised trials involving 554 operations, and 41 non-randomised studies involving 25622 operations were included.. Eleven of the non-randomised studies were prospective and 29 reported on a consecutive series of patients, but the methodological quality of many of the non-randomised trials was questionable. In nine non-randomised studies the number of arteries, as opposed to the number of patients, was unclear. Meta-analysis of the non-randomised studies showed that the use of local anaesthetic 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.

Meta-analysis of the seven randomised studies revealed a non-significant trend towards a reduced mortality within 30 days of the operation with LA (pooled odds ratio = 0.23, 95% CI = 0.05-1.02), but this estimate was based on a very small number of events (table). LA was however associated with a more convincing reduction in local post-operative haemorrhage (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 randomised trials comparing CEA performed under LA versus GA to allow reliable conclusions to be drawn. Non-randomised studies suggest potential benefits with the use of local anaesthetic, but these studies may be biased.

Implications for research

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

Table 1 Pooled absolute risks and odds of complications following CEA from 7 randomised trials of CEA performed under LA versus GA. Odds ratios were calculated by the standard Peto method. Heterogeneity of estimates between studies was calculated by the Chi-squared method. CI= confidence interval, MI= Myocardial infarction

Outcome	LA Event/ operation	GA Event/ operation	Odds ratio	95% CI	Heterogeneity p
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 haemorrhage	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

Reference

Rerkasem K, Bond R, Rothwell PM. Local versus general anaesthetic for carotid endarterectomy. Cochrane Database Syst Rev. 2004; (2): CD000126.