

Cochrane Corner Stroke

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Title: Carotid artery stenting versus endarterectomy for treatment of carotid artery stenosis

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Introduction

Atherosclerotic stenosis of the internal carotid artery is an important cause of stroke. Carotid artery stenting (CAS) is an alternative to carotid endarterectomy (CEA) for the treatment of carotid stenosis. This review updates a previous version last published in 2012 including all randomised clinical trials (RCTs) comparing CAS to CEA for treatment of carotid stenosis.

Objectives

To compare the benefits and risks of CAS and CEA in patients with symptomatic or asymptomatic carotid stenosis.

Methods

We searched the Cochrane Stroke Group Trials Register and the following databases: CENTRAL, MEDLINE, Embase, and Science Citation Index (all last searched August 2018). We also searched ongoing trials registers and reference lists, and contacted researchers in the field. All RCTs comparing CAS with CEA for symptomatic or asymptomatic atherosclerotic carotid stenosis were included.

One review author selected trials for inclusion, assessed trial quality and risk of bias, and extracted data. A second review author independently validated trial selection and a third review author independently validated data extraction. We calculated treatment effects as odds ratios (OR) and 95% confidence intervals (CI), with endarterectomy as the reference group. We quantified heterogeneity using the I^2 statistic.

Main results

We included 22 trials involving 9753 participants and used GRADE (Grading of Recommendations, Assessment, Development and Evaluation) methodology to assess the overall certainty of the evidence. We categorized our findings on symptomatic carotid stenosis as high-certainty evidence, and on asymptomatic carotid stenosis as medium-certainty evidence,.

In symptomatic carotid stenosis, CAS was associated with a higher risk of death or stroke within 30 days of treatment (periprocedural period; OR 1.70, 95% CI 1.31-2.19; $p < 0.0001$, $I^2 = 5\%$; 10 trials, 5396 participants) compared with CEA. Rates of periprocedural death or stroke did not differ significantly in people < 70 years (OR 1.11, 95% CI 0.74-1.64), but were significantly increased with CAS compared with CEA in patients ≥ 70 years (OR 2.23, 95% CI 1.61-3.08, interaction $p = 0.007$). CAS was associated with lower risks of myocardial infarction (OR 0.47,

95% CI 0.24-0.94; $p=0.03$, $I^2=0\%$), cranial nerve palsy (OR 0.09, 95% CI 0.06-0.16; $p<0.00001$, $I^2=0\%$), and access site haematoma (OR 0.32, 95% CI 0.15-0.68; $p=0.003$, $I^2=27\%$) than CEA.

CAS was associated with a significantly higher risk of the combination of periprocedural death or stroke or ipsilateral stroke during follow-up compared to CEA (OR 1.51, 95% CI 1.24-1.85; $p<0.0001$, $I^2=0\%$; 8 trials, 5080 participants; figure). However, the rate of ipsilateral stroke beyond 30 days after treatment alone did not differ between treatments (OR 1.05, 95% CI 0.75-1.47; $p=0.77$, $I^2=0\%$).

Among patients with asymptomatic carotid stenosis, there was a non-significant increase in periprocedural death or stroke with CAS compared with CEA (OR 1.72, 95% CI 1.00-2.97; $p=0.05$, $I^2=0\%$; 7 trials, 3378 participants). The risk of periprocedural death or stroke or ipsilateral stroke during follow-up did not differ significantly between treatments (OR 1.27, 95% CI 0.87-1.84; $p=0.22$, $I^2=0\%$; 6 trials, 3315 participants).

Moderate or higher carotid artery restenosis ($\geq 50\%$) during follow-up was more common after CAS (OR 2.00, 95% CI 1.12-3.60; $p=0.02$, $I^2=44\%$), but the difference in risk of severe restenosis was not significant ($\geq 70\%$; OR 1.26, 95% CI 0.79-2.00; $p=0.33$, $I^2=58\%$).

Conclusions

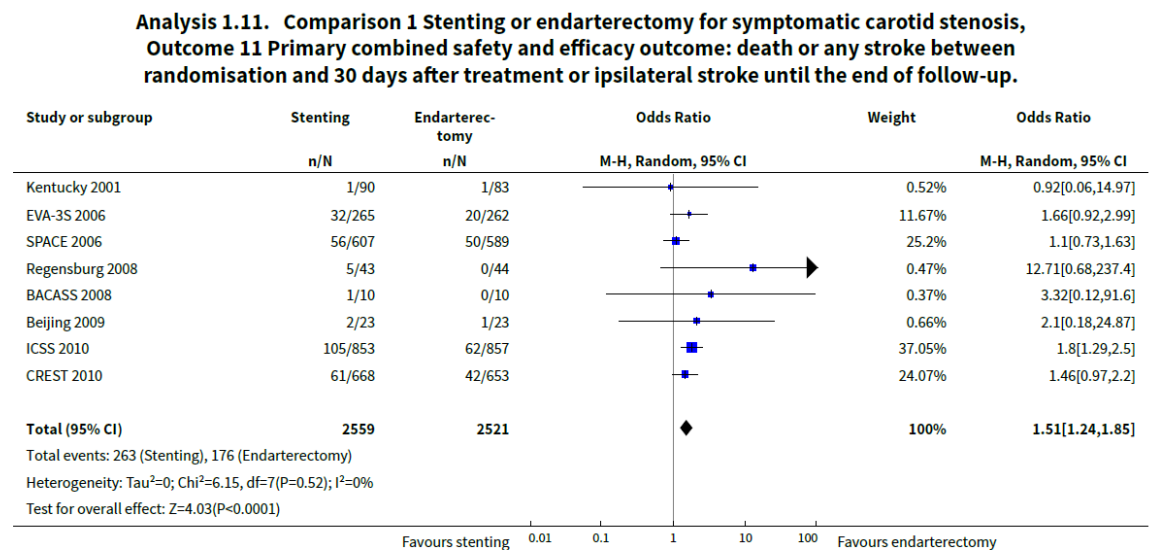
In patients with symptomatic carotid stenosis, CAS is associated with a higher risk of stroke or death within 30 days of treatment than CEA. This extra risk is mostly attributed to an increase in peri-procedural stroke occurring in patients ≥ 70 years. Beyond 30 days after treatment, CAS is as effective in preventing recurrent stroke as CEA. However, combining procedural safety and long-term efficacy in preventing recurrent stroke, CAS is still associated with higher risks than CEA.

In people with asymptomatic carotid stenosis, there may be a small increase in the risk of stroke or death within 30 days of treatment with CAS compared to CEA.

Implications for practice and future research

CAS can be safely offered as an alternative to CEA in patients with symptomatic carotid stenosis <70 years, provided both treatments are technically feasible. Older patients should be treated with CEA. In patients with asymptomatic carotid stenosis, the amount of evidence currently available is limited and further data from randomised trials are needed.

Figure



Disclosures

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Reference

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