



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

## Percutaneous Vascular Interventions Versus Intravenous Thrombolytic Treatment for Acute Ischemic Stroke

**Citation for published version:**

Lindekleiv, H, Bruins Slot, KMH, Wardlaw, JM & Berge, E 2019, 'Percutaneous Vascular Interventions Versus Intravenous Thrombolytic Treatment for Acute Ischemic Stroke', *Stroke*.  
<https://doi.org/10.1161/STROKEAHA.118.024298>

**Digital Object Identifier (DOI):**

[10.1161/STROKEAHA.118.024298](https://doi.org/10.1161/STROKEAHA.118.024298)

**Link:**

[Link to publication record in Edinburgh Research Explorer](#)

**Document Version:**

Peer reviewed version

**Published In:**

Stroke

**Publisher Rights Statement:**

This is the authors' peer-reviewed manuscript as accepted for publication.

**General rights**

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact [openaccess@ed.ac.uk](mailto:openaccess@ed.ac.uk) providing details, and we will remove access to the work immediately and investigate your claim.



URL: <http://stroke-submit.aha-journals.org>

Title: Percutaneous vascular interventions versus intravenous thrombolytic treatment for acute ischaemic stroke

Manuscript number: STROKE/2018/024298

Author(s): Haakon Lindekleiv

For Stroke Peer Review. Do not distribute. Destroy after use.

## **Percutaneous vascular interventions versus intravenous thrombolytic treatment for acute ischaemic stroke**

Haakon Lindekleiv MD, PhD; Karsten M. H. Bruins Slot MD, PhD, Joanna M. Wardlaw, MD, PhD; Eivind Berge, MD, PhD

From the University Hospital of North Norway, Norway (H.L.); Department of Internal Medicine, Oslo University Hospital, Oslo, Norway (E.B. and K.M.H.B.S); and Centre for Clinical Brain Sciences, University of Edinburgh, Edinburgh, United Kingdom (J.M.W).

For Stroke Peer Review. Do not distribute. Destroy after use.

Randomised trials have shown that percutaneous vascular interventions are superior to usual care in patients with stroke due to large artery occlusion. We have searched the literature for studies comparing percutaneous vascular interventions with intravenous thrombolytic treatment in patients with acute ischaemic stroke.

## **Objectives**

The objective of our review<sup>1</sup> was to assess the effectiveness and safety of percutaneous vascular interventions compared with intravenous thrombolytic treatment for acute ischaemic stroke.

## **Search Methods**

We searched the Cochrane Stroke Group Trials Register (last search: August 2018). In addition, in September 2017, we searched the following electronic databases: CENTRAL, MEDLINE, EMBASE, Science Citation Index; Stroke Trials Registry, and ClinicalTrials.gov.

## **Selection Criteria**

Randomised controlled trials that directly compare a percutaneous vascular intervention with intravenous thrombolytic treatment in people with acute ischaemic stroke.

## **Data Collection and Analysis**

Two review authors applied the inclusion criteria, extracted data, and assessed risk of bias. We obtained both published and unpublished data. We assessed the quality of the evidence using the GRADE approach.

## **Main Results**

We included four trials with 450 participants<sup>2-5</sup>. Data on functional outcome and death at end of follow-up were available for 443 participants from three trials.<sup>3-5</sup>

Compared with intravenous thrombolytic therapy, percutaneous vascular intervention did not improve the proportion of participants with good functional outcome at end of follow-up (modified Rankin Scale score 0 to 2 at 3 months, risk ratio (RR) 1.01, 95% confidence interval (CI) 0.82 to 1.25,  $P=0.92$ ; Figure). The quality of evidence was moderate (because outcome assessment was blinded, but not the treating physician or participants).

There was also no reduction in the proportion of participants who died in the percutaneous vascular intervention group (RR 1.34, 95% CI 0.84 to 2.14,  $P=0.21$ ), and no difference in the proportion of participants with symptomatic intracranial haemorrhage (RR 0.99, 95% CI 0.50 to 1.95,  $P=0.97$ ). The quality of evidence was low (because confidence intervals were wide).

## **Authors' Conclusions**

We found no evidence that percutaneous vascular interventions are superior to intravenous thrombolytic treatment in patients with acute ischaemic stroke.

## Sources of Funding

South-Eastern Norway Regional Health Authority, Norway. Educational grant.

## Disclosures

KBS is currently employed by F. Hoffmann-La Roche (Roche Norge AS). The data included in this review are based on research done before this employment and was not influenced by F. Hoffmann-La Roche by any means. The views expressed in this review are the personal views of KBS and should not be understood or quoted as being made on behalf of or reflecting the position of F. Hoffmann-La Roche.

The other authors report no conflicts.

## Footnotes

This paper is based on a Cochrane Review.<sup>1</sup> Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback. The Cochrane Library should be consulted for the most recent version of the review.

Correspondence to Haakon Lindekleiv, MD PhD, Hospital administration, University Hospital of North Norway, Norway, e-mail [haakon.lindekleiv@unn.no](mailto:haakon.lindekleiv@unn.no)

## Reference

1. Lindekleiv H, Berge E, Bruins Slot KMH, Wardlaw JM. Percutaneous vascular interventions versus intravenous thrombolytic treatment for acute ischaemic stroke. Cochrane Database of Systematic Reviews 2018, Issue 10. Art. No.: CD009292. DOI: 10.1002/14651858.CD009292.pub2.
2. Sen S, Huang DY, Akhavan O, Wilson S, Verro P, Solander S. IV vs. IA TPA in acute ischemic stroke with CT angiographic evidence of major vessel occlusion: a feasibility study. *Neurocritical Care* 2009;11:76-81.
3. Ducrocq X, Bracard S, Taillandier L, Anxionnat R, Lacour JC, Guillemin F, et al. Comparison of intravenous and intra-arterial urokinase thrombolysis for acute ischaemic stroke. *Journal of Neuroradiology* 2005;32:26-32.
4. Ciccone A, Valvassori L, Nichelatti M, Sgoifo A, Ponzio M, Sterzi R, et al. Endovascular treatment for acute ischemic stroke. *New England Journal of Medicine* 2013;368:904-13.
5. Ciccone A, Valvassori L, Ponzio M, Ballabio M, Gasparotti R, Sessa M, et al. Intra-arterial or intravenous thrombolysis for acute ischemic stroke? The SYNTHESIS pilot trial. *Journal of Neurointerventional Surgery* 2010;2:74-9.

## Figure legend

Figure. Odds ratio of good outcome (modified Rankin Scale score 0-2) in patients with acute ischaemic stroke treated with percutaneous vascular interventions versus intravenous thrombolytic treatment

