

Clinical update no. 542

7 August 2019

Presenting Problem CVA

56yr-M brought by ambulance after found lying on floor with left sided weakness and facial droop with slurred speech. Last seen well 5 hours prior.

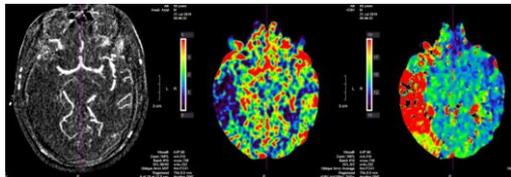
Ethanol

28.9

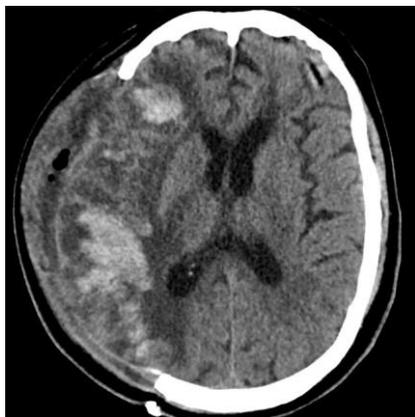
Ethanol 28.9 mmol/L (and 70 on a prior presentation). Drunk people get strokes too.



CT showed a hyperdense thrombus in the MCA with loss of grey white differentiation.



CT-angio and perfusion scan showed established infarct without an ischaemic penumbra to indicate salvageable tissue. Thrombectomy would not help.



Imaging at day 16, after hemicraniectomy.

Stroke care is increasingly based on perfusion imaging rather than being strictly time based. There is a potential for reperfusion and improved outcomes if imaging shows an ischaemic penumbra where reperfusion may prevent further infarction.

Studies suggest benefit from thrombectomy up to 24hr from stroke onset.

Perfusion imaging may identify patients who could benefit from thrombolysis at >4.5hr, and also wake up stroke where time of onset is unknown but could be less than that.



Review

How should we treat patients who wake up with a stroke? A review of recent advances in management of acute ischemic stroke☆☆☆

Articles

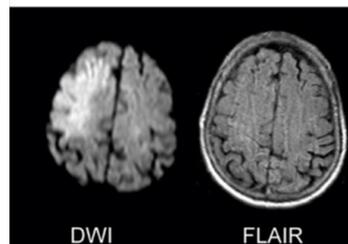
Extending thrombolysis to 4.5-9 h and wake-up stroke using perfusion imaging: a systematic review and meta-analysis of individual patient data

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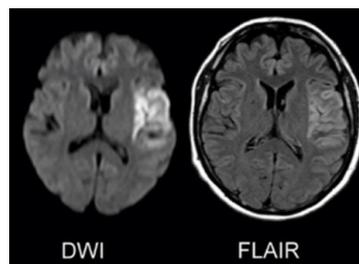
Interpretation Patients with ischaemic stroke 4.5-9 h from stroke onset or wake-up stroke with salvageable brain tissue who were treated with alteplase achieved better functional outcomes than those given placebo.



DWI-FLAIR-mismatch



Perfusion mismatch - reperfusion may improve outcome



If there is no mismatch then reperfusion would not be expected to benefit.

This study was a meta-analysis of individual patient data for patients thrombolysed at 4.5-9 hr or after wake-up stroke who had MRI or CT perfusion imaging. There was 3mth mRS outcome data on 410 patients from the EXTEND, ECASS4-EXTEND, and EPITHET trials. There was an excellent outcome (mRS 0-1) in 76/211 (36%) given alteplase, and 58/199 (29%) given placebo (OR 1.86, CI 1.15-2.99, p 0.01).

NNT 14; symptomatic ICH 5% v 1%; mortality 14% v 9%. Severe disability was less with alteplase, mRS 4-5 in 23 v 33%.

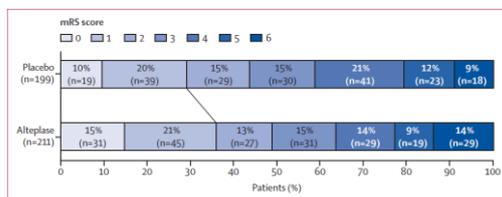
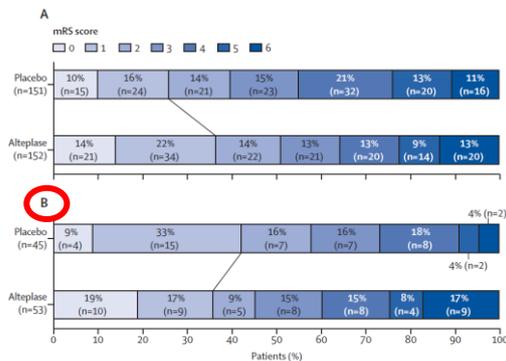


Figure 1: mRS scores at 3 months for all patients
mRS=modified Rankin Scale.

mRS 0-1 excellent outcome; 2-3 moderate disability;
4-5 major disability; 6 death.

Studies used different criteria. Image data was reprocessed by automated software and outcomes were re-analysed based on the presence of automated perfusion mismatch.



mRS score at 3 months: A. with automated perfusion mismatch, B. without mismatch

Thrombolysis given to patients without automated perfusion mismatch (B) gave worse outcomes (mRS 0-1 in 36% v 42%; and mRS 0-2 in 45 v 58%, and death in 17 v 4%). There was no reduction in major disability. Small numbers limit conclusions. Automated perfusion imaging *may* allow better selection of patients for possible benefit from reperfusion but better data is needed.

The better outcomes with mismatch/alteplase (A) is confounded by the alteplase group having a smaller ischaemic core volume. For those without mismatch the alteplase group had a higher NIHSS score of 10 v 6.5 and a larger ischaemic core.

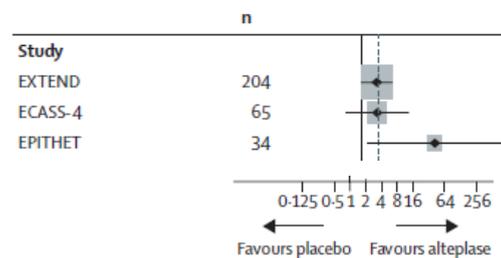
	Placebo (n=201)	Alteplase (n=213)
NIHSS score	10	12
Ischaemic core volume, cc	8.1	8.0
Perfusion lesion volume, cc	64.3	63.9

Table 1: Baseline characteristics of all patients

	Placebo (n=152)	Alteplase (n=152)
NIHSS score	11	12
Ischaemic core vol, cc	8.9	6.2
Perfusion lesion volume, cc	75.1	74.0

Table 3: Baseline characteristics of patients with automated perfusion mismatch

B Patients with perfusion mismatch



The 3 trials did not give uniform results, with much better outcomes in the EPITHET trial for those with automated mismatch.

Late thrombolysis for stroke works, but how do we do it?

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Imaging used and current practice varies, and can be subjective. Automation may help less experienced centres. The findings should not prevent referral for endovascular clot retrieval, but might allow thrombolysis if delays, or if clot retrieval not available. Clear evidence for automated perfusion imaging is scarce and optimal imaging is not clear.

These updates are a review of current literature at the time of writing. They do not replace local treatment protocols and policy. Treating doctors are individually responsible for following standard of care.