DEM Journal Club

Article Appraisal

Article: Goyal M, et al. Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke. NEJM. 2015; 372(11): 1019-1030.

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Background and Study Objective(s):

Previous studies of neurointerventional therapy for acute ischemic stroke failed to show positive outcomes across the board in large stroke populations. This study, the ESCAPE trial, is one of three recent studies that examined neurointerventional therapy for ischemic stroke in very focused stroke populations that were most likely to benefit. Specifically, the ESCAPE trial included patients based on favourable CT imaging, de-emphazing time from symptoms.

Study Design:

Multicenter, prospective, randomized trial. Patients were randomized using a real-time minimization procedure (minimal sufficient balance method) that balanced groups in real time based on demographics and NIHHS score. Patients then received guideline based stroke care +/- an open-label neurointerventional procedure. The outcome evaluation was blinded, which was largely clinical scores of neurologic disability (modified Rankin Score, NIHSS, etc) as well as an imaging score of reperfusion success on CT (TICI score). The primary outcome was the modified Rankin (mRS) score at 90 days after randomization. They used a common odds ratio for the likelihood of improving the mRS by one point. Secondary and safety outcomes included intracranial haemorrhage, angiographic complications, neurologic disability at 90 days measured by other clinical scores, recanalization/reperfusion, and death.

Results:

The study was stopped early based on the results of a concurrent study (MRCLEAN) which reported a survival benefit from neurointerventional techniques; they stopped almost exactly where they had previously planned to with an interim analysis however.
The neurointerventional group had a significant mobidity and mortality benefit. The primary outcomes 'common odds ratio' of improving mRS by 1 point was 2.6, while all other clinical scales of disability at 90 days, including the mRS's of 0-2 (which is a great neurologic outcome) all had ratio's significantly >1, implying a benefit for neurointerventional techniques in this population. The mortality of the intervention group was nearly half that of the control group (10.4 vs 19%; rate ratio 0.5). Serious adverse events were found in both groups with 4 events in the intervention group (3 large access site hematomas and 1 MCA perforation; however the rate of symptomatic ICH was not significantly different)

Validity of Results:

The common odds ratio and all other rate ratios reported remained clear of 1 suggesting a clear benefit in favour of the neurointerventional group. The decision to stop the trial early was appropriate and does not tarnish the reported results.

Generalizability of Results:

These studies are not entirely generizable at this time. This study was performed in very high level stroke centers where time from symptoms to neurointervention was exceptional. While the patients studied undoubtedly present to emergency departments everywhere, the ability to rapidly diagnose them with expert neuroradiology and then get them to timely intervention is not the case at all hospitals and it may take considerable investment of resources to get them there. That being said, in response to these results it was emphasized that this trend is occurring locally.

The Bottom Line:

In highly selected ischemic stroke patients with lesions ameniable to neurointerventional techniques, these therapies can have a significant positive impact on mortality and neurologic outcome. The results of this paper were not in doubt, but it must be kept in mind that this does not apply to the majority of ischemic stroke patients and is not currently valid for all centers.