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SOCIETY FOR NEUROSCIENCE IN ANESTHESIOLOGY AND CRITICAL CARE

ARTICLE OF THE MONTH

Effect of General Anesthesia and Conscious Sedation During Endovascular Therapy on Infarct Growth and Clinical Outcomes in Acute Ischemic Stroke: A Randomized Clinical Trial

Simonsen CZ, Yoo AJ, Sørensen LH, Juul N, Johnsen SP, Andersen G, Rasmussen M.
JAMA Neurol. 2018 Jan 16. doi: 10.1001/jamaneurol.2017.4474

Welcome to the February 2018 installment of the SNACC Article of the Month! The article presented today is the GOLIATH trial, the last study published looking at the effects of general anesthesia versus conscious sedation during endovascular therapy for stroke.

The expert commentary is provided by Claas Siegmueller, MD, PhD, MBA. Dr Siegmueller is an Assistant Professor in the Department of Anesthesia and Perioperative Care at UCSF and an active SNACC member.

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~ Oana Maties MD, Nina Schloemerkemper MD and Adrian Pichurko MD

Commentary

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Endovascular therapy (EVT) through mechanical clot disruption or extraction, combined with local targeted thrombolysis, has become a standard of care for patients with acute ischemic stroke due to large vessel occlusions in the anterior circulation presenting soon after symptom onset. There is controversy however which anesthetic management, namely general anesthesia versus conscious sedation, is better suited for endovascular procedures. The GOLIATH (General or Local Anesthesia in Intra Arterial Therapy) trial, an investigator-initiated, single-center, prospective, randomized, open-label, blinded end-point evaluation, which recruited patients between March 2015 and February 2017, was designed to answer this question.

The hypothesis was that patients receiving EVT under conscious sedation (CS) as opposed to general anesthesia (GA) have less infarct growth, which was the primary outcome measure. Infarct growth was reported in milliliters and assessed by MRI at the time of presentation and a follow up scan 48-72 hours after symptom onset. Secondary outcome measures were modified mRS (modified Rankin Sale) scores after 90 days, time and blood

pressure levels, and several safety end points such as symptomatic intracranial hemorrhage, 90-day mortality, vessel injury and clot migration to a previous unaffected territory. In addition, successful reperfusion was assessed using the modified Thrombolysis in Cerebral Ischemia (mTICI) scale score.

Of the 1501 patients evaluated for acute ischemic stroke, 128 were eventually randomized. The most commonly applied exclusion criterion was that of a NIH stroke scale (NIHSS) score <10, leading to 1105 patients not being enrolled. Other patients were not included for other reasons such as large infarct size and a significant premorbid mRS.

During EVT, patients received a propofol infusion and iv fentanyl boluses as needed in the CS arm, and propofol and remifentanil infusions for anesthesia maintenance in the GA arm of the trial. Propofol was used for both groups as to minimize the confounding effect of different drugs.

Both groups were balanced for size, age, sex, NIHSS score (median of 18), stroke risk factors, time to qualifying scan, level of occlusion, rate of intravenous tissue plasminogen activator pretreatment, EVT methodology and initial infarct size.

The main result of the trial was that, regarding infarct growth, there was no statistically significant difference between the GA and CS groups (median [IQR], 8.2 [2.2-38.6] mL vs 19.4 [2.4-79.0] mL; P = .10). Means for infarct growth were 57.4 mL for CS and 43.1 mL for GA (95% CI: −6.4 to 52.9) assuming normally distributed data. Reperfusion was better in the GA group (76.9% vs 60.3%; P = .04), as were early neurological outcomes, although this did not reach statistical significance. At 90 days mRS scores were likely to be lower in the GA group with an odds ratio (OR) for lower scores of 1.91 (95% CI: 1.03 to 3.56).

In conclusion, the results of the GOLIATH trial suggest that GA is not inferior to CS in the anesthetic management of patients presenting for EVT. This contradicts several previous studies which pointed towards worse outcomes for patients undergoing GA. The authors discuss that these trials did not randomize for anesthetic management which could have led to confounding bias , i.e. patients with more severe strokes, and therefore more likely to have worse outcomes, were also more likely to be given a GA.

The results of the GOLIATH study have to be interpreted with a degree of caution. Since the research was conducted in a single center only, the findings might not apply to stroke units using different anesthetic and EVT techniques. In addition, the trial was designed to assess differences in infarct growth, so conclusions about anesthetic management having direct influence on clinical outcomes cannot be safely made. Lastly, the fact that the fairly large difference in infarct growth between the GA and CS groups (median 8.2 mL and 19.4 mL respectively) was not statistically significant raises the question whether the study was under-powered.