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Clinical Question: Could a clinical decision tool improve patient outcomes suffering from acute ischemic strokes by predicting individual treatment benefit of endovascular therapy?

The Bottom Line: Using a total of 11 patient characteristics, both clinical and radiographical, the predicted benefit for an individual patient receiving endovascular therapy can be made, using a predicted modified Rankin Scale at 90 days.

Background: With stroke being the most common cause of disability in high income countries and the second most common cause of death worldwide, there is increasing interest in improving treatment outcomes from stroke. The current practice and main treatment is with intravenous tPA therapy with a debate on whether patients should be given endovascular therapy and what benefit there may be. A large number of trials have been performed evaluating the benefit of endovascular therapy, but there has been no trial or study to determine whether a clinical decision making tool could be created to estimate the patient benefit for endovascular therapy.

Methods: A multivariable prediction model was created based on observational data from the MR CLEAN (Multicenter Randomised Clinical Trial of Endovascular Treatment for Acute Ischaemic Stroke in the Netherlands) trial. Using patient characteristics obtained from the treatment arm of the trial prior to treatment, odds ratios were created to evaluate whether the variable had a predictive factor on outcomes that were observed after treatment. 11 variables were identified: age, NIHSS, pre-stroke modified Rankin Scale, h/o stroke, h/o DM, SBP, tPA administration, ASPECTS (Alberta Stroke Program Early Computed Tomography Score), location of the occlusion, CTA collateral score, and estimated time from stroke onset to groin puncture. Once the predictive model had been created, it was validated using patient data from the IMS III trial. The goal was prediction of treatment benefit at 90 days based on modified Rankin Score.

Results: The model was created based on baseline characteristics of the treatment cohort of the MR CLEAN trial, 500 patients, and was validated against the treatment group of the IMS III trial, for 260 patients. It was found that the strongest predictors were the 11 included in the predictive model. The predictive model was then turned into a web tool to aid in the decision as to whether endovascular therapy would benefit a patient or not.

Discussion: This was an interesting study from the aspect of trying to predict the benefit of endovascular therapy. Based on the web tool, it can give predicted absolute treatment benefit, but is limited as to the exact benefit of functional outcome for the patient. IT attempts to do this with a bar-graph, but it could be clearer in that delineation. My largest concern is they state that they have externally validated the tool by using another study. The problem being that this is not a true external validation as it was performed by the same team. I think the tool could be beneficial in discussion on whether endovascular therapy should be considered, but I would not use it as a steadfast rule. I would also like to see a true external validation by another research group, or using it in a randomized-controlled trial to see the true predictive natures without using pre-existing data or observational data.
