INTERNATIONAL JOURNAL OF
CLINICAL NEUROSCIENCES
AND MENTAL HEALTH

DEBATE

Can we prevent futile recanalization in patients undergoing endovascular treatment for acute ischemic stroke?

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From the Lisbon Stroke Summit, Lisbon, Portugal. 5–6 April 2019.

Abstract

Endovascular stroke treatment is highly effective and shows low risk of complications. Futile recanalization, defined as lack of clinical benefit despite angiographic recanalization, is an important limitation of this treatment modality for acute ischemic stroke. Its prevalence is highly variable and up to 47% in the IMS III clinical trial. From a pathophysiological point of view, a multitude of mechanisms cause this failure, mainly a combination of clot composition, clot burden, bad collateral circulation, subacute re-occlusion, large hypoperfusion volumes, microvascular compromise and impaired cerebral autoregulation. The financial impact on health care resources could be huge if we could predict and impact futile recanalization rates. However, refusing endovascular treatment remains multi-parametric decision taking into account various clinical and imaging finding. Defining futile recanalization should be very reliable. The predictors for futile recanalization can be divided in preprocedural, procedural and post-EVT parameters. Various single parameters have been advocated and are clinically used to withhold endovascular therapy such as older age, female gender, high NIHSS, large infarct volumes, late time window, etc. Imaging-based selection should incorporate the analysis of the presence of large DWI infarct lesions in deep white matter, moderate to severe leukoaraiosis and poor collaterals, as they predict poor prognosis despite successful recanalization. Robust collaterals warrant consideration for recanalization therapy promoting the chance of better prognosis. Above four stent retriever passes, the functional outcomes seems not more favorable than without recanalization (OR 1.70; 95% CI 0.42-6.90). Further, recanalization has been associated with reduced ischemic brain edema in patients with good clinical outcome. The edema volume are significantly higher in patients with a mRS 5-6 (8,6ml; (2.0–49.8 ml) vs. mRS 0-4 (1.6ml; 0.2-4.2ml). An important subgroup of patients are the very elderly. A substantial proportion of nonagenarians shows futile recanalization. Clinical response, measured by delta mRS, was better in the group with successful compared to unsuccessful recanalization [2.8±1.6 vs. 3.9±1.2 (mean±SD)]. Nonetheless, meaningful recanalization was low (18.2%), especially with respect to 75% of patients having a pre-stroke mRS≤2. Treatment decisions should be made on case-by-case evaluation, keeping in mind limited chances of favorable outcome and high risk of mortality.

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Citation: Vanacker et al. Can we prevent futile recanalization in patients undergoing endovascular treatment for acute ischemic stroke?. International Journal of Clinical Neurosciences and Mental Health 2019; 6(Suppl. 1):D7

Published: 04 April 2019