

Endovascular Treatment versus Best Medical Treatment for Ischemic Stroke with Large Vessel Occlusion in the 6–24 Hour Window among Non-DAWN-Non-DEFUSE Patients

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ABSTRACT

Background: Two randomized clinical trials – DAWN¹ and DEFUSE-3² – with restrictive enrollment criteria showed the benefit of endovascular treatment (EVT) for acute ischemic stroke due to large vessel occlusion (LVO) in the time window between 6-24 hours after symptom onset. However, in clinical practice, approximately 4 out of 5 patients do not fulfill the DAWN and DEFUSE-3 criteria yet receive EVT. We aim to compare the efficacy and safety of EVT to best medical treatment alone (BMT) for acute ischemic stroke due to LVO in the extended time window in non-DAWN-non-DEFUSE patients at the University Hospital Basel.

Methods: We conducted a unicenter, retrospective cohort study with patients with acute ischemic stroke due to an occlusion of the intracranial internal carotid artery, main stem occlusion of the middle (M1) or anterior (A1) cerebral artery who presented within 6-24 hours after symptom onset or last known to be well at the University Hospital Basel between January 2014 and December 2020. Clinical data was obtained from the Swiss Stroke Registry, ischemic core and tissue at risk volumes were calculated based on CT perfusion source data using RAPID software (iSchemaView) in line with the DAWN and DEFUSE-3 trials. As primary outcome measure, we compared the disability at 90 days using the modified Rankin scale (mRs; 0-2 indicating favorable outcome, 3-6 unfavorable outcome) between the EVT and BMT groups. The safety endpoint was the rate of symptomatic intracranial hemorrhage at 90 days, stratified regarding performed vs. not-performed EVT.

Results: Of a total of 56 patients, 41 received EVT and 15 BMT. The proportion of non-DAWN-non-DEFUSE patients was 39.3%, DAWN criteria were met by 48.2%, and DEFUSE-3 criteria by 32.1%. Among non-DAWN-non-DEFUSE patients, 68.2% received EVT, among DAWN patients 74.1%, and among DEFUSE-3 patients 83.3%. Within the non-DAWN-non-DEFUSE group, stroke severity on admission did not significantly differ between the EVT and BMT group (median NIHSS: 18 [IQR 14-21] vs. 17 [IQR 2-23], $p=.403$). In CT perfusion imaging, overall median CBF<30% volume was 10 mL (IQR 0-24), Tmax>6s volume was 107 mL (IQR 64-148), and mismatch volume was 94 mL (IQR 57-117). A mismatch ratio of ≥ 1.8 was present in 87.5%, with a significant difference between the EVT and BMT groups (79.6% vs. 20.4%, $p=.042$). Among non-DAWN-non-DEFUSE patients, functional outcome at three months was favorable (mRs 0-2) in 15.8%, with a difference between the EVT and BMT group without reaching statistical significance (66.7% and 33.3%, respectively, $p=.705$). The rate of symptomatic intracranial hemorrhage at three months was overall low, with only one case in the EVT group.

Conclusions: The proportion of non-DAWN-non-DEFUSE patients in our cohort was relatively low at 39% compared with other studies, with the majority of non-DAWN-non-DEFUSE patients receiving EVT. EVT was numerically superior concerning functional outcome without an excess of observed symptomatic intracranial hemorrhage in the EVT group. An extension of the study with data from other Swiss stroke centers will be performed.

REFERENCES

¹ DAWN (trial) = Diffusion-weighted imaging or computerized tomography perfusion assessment with clinical mismatch in the triage of wake up and late presenting strokes undergoing neurointervention with Trevo

² DEFUSE-3 (trial) = A multicenter randomized controlled trial of endovascular therapy following imaging evaluation for ischemic stroke