CORRESPONDENCE

Mechanical Thrombectomy in Stroke

by Prof. Dr. med. Jens Fiehler, Prof. Dr. med. Christian Gerloff
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Intra-arterial Treatment

The studies of IV fibrinolysis differ from the presented studies in particular with regard to the lacking confirmation of an occluded cerebral artery and the lesser degree of severity of the stroke. In such patients, the effect of fibrinolysis upon recanalization rate and treatment result of intra-arterial therapy (IAT) has yet to be determined.

In the ESCAPE study (1), recanalization rates of IAT with and without fibrinolysis did not significantly differ from one another (71% versus 77%; odds ratio 0.70; 95% confidence interval [0.31; 1.59]).

The metaanalysis of the ESCAPE and REVASCAT (2) study data indicates neither a significant difference in the treatment result of IAT with and without fibrinolysis (49% vs 51%; OR: 0.92; 95%-CI: [0.54; 1.56]) nor between IAT with and without fibrinolysis and the respective control groups (absolute risk reduction [aRR] 20.1 percentage points; OR: 2.36; 95%-CI: [1.55; 3.60] versus aRR 23.5 percentage points; OR: 2.74; 95%-CI: [1.30; 5.75]). Whether other factors affect these results is not obvious on the basis of the study data. However, patient selection including perfusion imaging has an impact on the probability of favorable prognosis rather than the effect of treatment (3).

In large thrombus volumes the therapeutic benefit of IAT may be explained by the effect of mechanical vascular recanalization and not by the effect of fibrinolysis. For this reason, IAT extends the therapeutic spectrum – rather than complementing it – to a group of patients in whom intravenous fibrinolysis obviously does not have a significant therapeutic effect and can therefore not be described as standard therapy. Withholding IAT from a patient without prior fibrinolysis can definitely not be justified in view of what is currently known.

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Hemodilution

Mechanical thrombectomy in stroke is a useful additional option to thrombolysis. However, as the authors themselves wrote, only 4–10% of all stroke patients benefit from this intervention (1) Unfortunately, on average only 12% of patients with cerebral infraction receive thrombolysis treatment; in Berlin, the proportion is 14%, but in rural areas it is notably lower.

The guideline for the diagnostic evaluation and therapy in neurology with the AWMF [Association of the Scientific Medical Societies in Germany] registration number 030/46 expressly does not recommend hemodilution treatment. For the most part, this is based on a review by Asplund, which was published in 2002, which included 18 studies of hemodilution (2). Dextran-40, hydroxyethyl starch (HAES), or albumin were used for the purpose of dilution, which was done hypervolemically or isovolemically. Mortality did not reduce significantly in the initial four weeks and six months. Tendentially positive clinical effects were observed for HAES and albumin.

Only a maximum of 20% of stroke patients—about 50 000 patients per year—benefit from thrombolysis or thrombectomy. For this reason, hypervolemic hemodilution with HAES or albumin should not be ruled out as a matter of principle, but should be regarded as an option especially in older patients who are not able take in sufficient fluids orally. Hemodilution leads to a clear improvement in microcirculation, even in the brain (3).

Further studies investigating the effectiveness of hemodilution are needed. DOI: 10.3238/arztebl.2016.0375b

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In Reply:

We regarded it as our task to present level I evidence for the interventional acute treatment of ischemic stroke, which has become available for the first time in almost 20 years, and to explain the ensuing consequences for stroke management and neuroradiological imaging (1).

However: in studies of mechanical thrombectomy (MT), IV-rtPA was the standard for all patients except those with contraindications.

When such contraindications did not simultaneously rule out MT, this procedure was used without IV-rtPA. None of the studies was designed to compare MT plus IV-rtPA with MT alone.

In this setting, what generally applies is as follows: the absence of a difference does not prove equivalence, and neither does it prove non-inferiority. It therefore remains true that we have level I evidence for combined therapy IV-rtPA plus MT in the patient groups described.

The following issue is another one in which we probably do not disagree much with what Koch writes in his letter: no one wants to withhold MT from a patient with proximal vascular occlusion and substantial neurological deficit.

However, it is our responsibility to apply the new method in a targeted fashion and to remain as close to the protocols used in the study as it is possible in clinical practice. It cannot be in our patients' interest to use MT uncritically far beyond the 6 hours—for example, because of lengthy transport times.

In order to identify such potential problems as early as possible (and also in order to establish the conditions under which very late recanalizations are safe and effective in clinical practice) we would ask for further studies and, simultaneously, very strict quality assurance, such as is possible by means of the German Stroke Registry, combined with the database of the DGNR/DeGir.

Our position is less close to that of Kiesewetter. We agree only in one aspect: even after MT has been identified as an evidence based extension of acute therapy after ischemic stroke, a whole lot remains to be done—even after therapy with IV-rtPA and MT, the assumption is that 50% of patients who have had a stroke will continue to have substantial impairments.

It is therefore our credo that it is important to support stroke research and to ensure that basic research is supported on the one hand, and that as many hospitals with stroke units include their patients in clinical studies, on the other hand.

With regard to hemodilution, evidence for positive effects in ischemic stroke is lacking (2).

The relevant meta-analysis provided neither indications for improved survival nor for functional recovery after ischemic stroke. On the contrary, there is hard evidence that hemodilution with HAES is nephrotoxic in critically ill patients and increases mortality (3).

For completeness's sake we wish to add that HAES is now contraindicated in intracranial or cerebral hemorrhage (4), for the reasons explained. An attempt at cure using HAES cannot be recommended in ischemic stroke.

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