Intra-Arterial Thrombolysis Is the Treatment of Choice for Basilar Thrombosis

Pro

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Parachutes to prevent death and disability from gravitational challenge.

The basis for parachute use is purely observational.

Apparent efficacy could be explained by a healthy cohort effect.

Individuals who insist that all interventions need to be validated by a RCT need to come down to earth with a bump.

Basilar artery thrombosis (BAT) is a rare but most severe subtype of ischemic stroke often presenting with progressive or hyperacute brain stem symptoms, tetraplegia and loss of consciousness ranging from somnolence to frank coma. It is associated with a mortality between 50% and 90% in patients treated conventionally (antiplatelets or heparin) or not at all. If survived, the consequence is a locked-in syndrome, the most gruesome outcome thinkable. Different patterns include caudal vertebrobasilar, mid-basilar and top-of-the-basilar thrombosis, the former mostly being of atherothrombotic and the latter of embolic origin. Multiple case series mostly addressing intra-arterial (IA) and less frequently intravenous thrombolytic therapy for BAT have been published in the last 20 years, the first report by Zeumer et al dating back to 1982. Most studies suffered from small numbers: <10 patients with only a few in the range of 40 to 50 patients. All had an open, retrospective or partly prospective design with differing treatment regimens, mostly IA thrombolytic drugs formally rendering level III evidence at best.

Whereas some studies only used presence or absence of recanalization induced by a thrombolytic as a surrogate outcome, in all but 1 series it was shown that overall survival and an independent outcome was associated with successful partial or complete recanalization of the occluded basilar artery (BAO). Recanalization rates ranged from 40% to 100%, on average ~50% to 60% in line with the results from the Prolyse in Acute Cerebral Thromboembolism II (PROACT II) trial. Survival in patients without recanalization ranged from 0% to 20% as opposed to 40% to 80% in those with recanalization. A recent meta-analysis by Lindenberg analyzed systematically published case series of ≥10 patients reporting the outcome of BAO after IA or IV thrombolysis within 12 hours. In 420 BAO patients treated with IV thrombolysis (n=76) and IA thrombolysis (n=344), death or dependency were equally common: 78% (59 of 76) and 76% (260 of 344), respectively (P=0.82). Recanalization was achieved more frequently with IA thrombolysis (225 of 344; 65%) than with IV thrombolysis (40 of 76; 53%; P=0.05), but survival rates after IV thrombolysis (38 of 76; 50%) and IA thrombolysis (154 of 344; 45%) were similar (P=0.48). A total of 24% of patients treated with IA thrombolysis and 22% treated with IV thrombolysis reached good outcomes (P=0.82). Without at least partial recanalization, the likelihood of a good outcome was close to zero (2% versus 38%).

An Australian group ventured to perform a randomized trial (Australasian Urokinase Stroke Study) after a pilot trial (Australasian Urokinase Stroke Trial [AUST]) published in 1997. The pilot study included 15 patients with only a few in the range of 40 to 50 patients. All had an open, retrospective or partly prospective design with differing treatment regimens, mostly IA thrombolytic drugs formally rendering level III evidence at best.

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study was terminated because of low recruitment (20 patients screened, 16 randomized). There were only 4 deaths in each group, 7/8 in the placebo group were disabled or dead, only 4 in the treatment group (ie, all survivors had an independent outcome). The early termination is disappointing because the total sample size would have been 65 patients (absolute effect size of 35%, 2-sided α, power 0.8) to answer this question once and for all with IA thrombolysis for vertebrobasilar stroke becoming a level A recommendation.

Taking into account recent recommendations\(^{14}\) a new randomized study could screen with CT angiography, randomize 2 (active IA):1 (placebo), and have a consistent protocol regarding the therapeutic strategies such as concomitant treatment with abciximab, use of devices and other interventions.

We believe such a study would be desirable but it will never happen. The condition itself is rare, and we doubt that logistical problems can be overcome, and investigators at the expert centers with the largest experience will hesitate to randomize their patients. On the other hand, do we really need a new trial? Recanalization and reperfusion whether in anterior or posterior territory stroke is the strongest predictor if not a condition sine qua non for survival and independence. The currently available data albeit not level I evidence provide more than enough information in favor of IA thrombolysis (maybe also IV thrombolysis) for BAT. In fact, in our opinion it is not the worst level of evidence if one can show that a drug designed to lyse clots can do exactly that in a considerable percentage of patients experiencing stroke attributable to an occluded vessel, and that those patients, whose vessels are reperfused have a far better outcome. In addition, upcoming studies using devices and add-on medications as well as PTA and stenting (eg, the Interventional Management of Stroke studies) likely will strengthen our point.\(^{15}\)

Therefore, although we advocate randomized studies to answer several questions in acute and secondary prophylactic treatment of stroke we find it ethically unacceptable to randomize a patient to placebo versus conventional treatment thereby precluding him the chance of \(\approx 50\%\) for surviving an otherwise almost always deadly stroke and a \(\approx 35\%\) chance for being an independent survivor. We doubt that critics of IA thrombolysis for BAT would consent to inclusion in such a placebo-controlled study for themselves or their next of kin, like we doubt they would enter the above-mentioned parachute trial. At a certain point, patients with an infrequent disease with such a grim prognosis should be treated despite lack of level I evidence data. “Stop trying to control everything and just let go. Let go!”\(^{16}\)

References


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