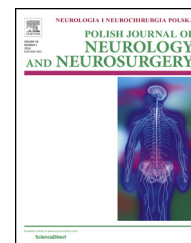


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## Letter to Editor

## Future challenges of stroke treatment



## A B S T R A C T

## Keywords:

Stroke

Basilar artery occlusion

Thrombolysis

Thrombectomy

Posterior circulation stroke accounts for approximately 20% of all ischaemic strokes. Acute basilar artery occlusion (BAO) is one of the most severe conditions, it is associated with death or major disability in more than three quarters of the cases, and its optimal management remains unestablished. Currently, the treatment is based primarily upon consensus, the clinical practice varies widely, and the actual benefit of mechanical thrombectomy has to be fully estimated. Although the recent years have profoundly revolutionized and improved the stroke care, many questions still remain unanswered and will represent the challenges of the next future.

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We greatly appreciated the article by Wyszomirski et al. who systematically reviewed the evidence about the efficacy of the intra-venous (IV) and intra-arterial (IA) thrombolysis with recombinant tissue plasminogen activator (rt-PA) and mechanical thrombectomy (MT) in the treatment of acute basilar artery occlusion (BAO) [1].

The first striking issue raised by the pooled analysis is the very low quality of the currently available data. Among the 31 included records, there was no single randomized controlled trial: all studies were observational, mostly retrospective and single centre-based, with a small number of patients in each arm. Hence, all the limits of the uncontrolled series should be taken into account: the reasons underpinning the choice of a specific option are more complex than can be captured within the aim of a stroke registry, and selection bias could act as a meaningful confounding factor. In addition, multivariable analyses can never completely adjust for unmeasured outcome-related variables, systematic differences in definitions and protocols, and imbalances between treatment groups according to baseline patients characteristics, time onset-to-treatment, or method and timing of diagnosis and follow up. It is also noteworthy considering that only three reports described findings from the IV rt-PA therapy, although

intravenous fibrinolysis is widely accessible and easy to perform, and represents the standard of care in acute ischaemic stroke.

Second, the meta-analysis highlighted how unfavourable is the prognosis of patients presenting with posterior circulation stroke. Despite the advancement in stroke care and the availability of several treatment strategies, acute BAO is still associated with death or major disability in more than three quarters of the cases.

Third, a strong relationship exists between revascularization and prognosis: although higher recanalization rate does not automatically translate into better clinical outcome, there is hardly any chance of favourable recovery if recanalization does not occur [2]. Bearing in mind that early recanalization is substantial, the rt-PA alone is more likely to fail in the presence of large clot burden, and the endovascular intervention represents the most effective method of artery recanalization, it is reasonable thinking that MT could be the most effective treatment of patients with acute BAO, as suggested by the pooled integrated analysis [1]. To this respect, neuro-thrombectomy has undoubtedly signed the dawn of a new era and represented the greatest advance in the management of acute ischaemic stroke since the definitive approval of the intravenous tissue-type plasminogen activator in 1996. However, all trials investigating the efficacy and safety of the endovascular strategy have mainly involved anterior circulation proximal

occlusions, and their results could not directly apply to patients with basilar artery involvement since the several factors distinguishing BAO from middle cerebral or internal carotid artery disease, as the severity of the deficit, the high poor-outcome rate, the collateral blood-flow supply and the time-window for treatment.

The recent years have profoundly revolutionized and improved the stroke care [3–9]; nonetheless, many questions still remain unanswered and will represent the challenges of the next future. To date, the management of acute ischaemic stroke due to BAO is based primarily on consensus, empirical cases series and observational data, the clinical practice varies widely, and the actual benefit of the endovascular strategies has to be estimated exactly. The Acute Basilar Artery Occlusion: Endovascular Interventions versus Standard Medical Treatment (BEST) Trial (ClinicalTrials.gov number, NCT02441556) [10] and the Basilar Artery International Cooperation Study (BASICS) (NCT01717755) [11] are the only on-going, actively recruiting, randomized clinical trials aimed to evaluate the efficacy and safety of the standard medical therapy (IV rt-PA) plus the endovascular treatment (thrombus retraction, aspiration or use of a stent retriever device) (BEST trial) or the IA thrombolysis (BASICS) versus the standard medical therapy alone in patients with BAO presenting within 8 and 6 h from the estimated occlusion time, respectively. These trials will recruited more than 600 patients until January 2020 (BASICS) and March 2018 (BEST trial), and their findings are expected to provide novel and evidence-based insights into the optimal approach for acute BAO treatment.

### Conflict of interest

None declared.

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### REFERENCES

- [1] Wyszomirski A, Szczyrba S, Tomaka D, Karaszewski B. Treatment of acute basilar artery occlusion: systematic review and meta-analysis. *Neurol Neurochir Pol* 2017;51(6): 486–96.
- [2] Dornak T, Herzig R, Sanak D, Skoloudik D. Management of acute basilar artery occlusion: should any treatment strategy prevail? *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub* 2014;158(4):528–34.
- [3] Miao Z. New era of stroke therapy and new challenges. *Stroke Vasc Neurol* 2016;1(1):6–7.
- [4] Lattanzi S, Cagnetti C, Provinciali L, Silvestrini M. How should we lower blood pressure after cerebral hemorrhage? A systematic review and meta-analysis. *Cerebrovasc Dis* 2017;43(5–6):207–13.
- [5] Lattanzi S, Silvestrini M, Provinciali L. Elevated blood pressure in the acute phase of stroke and the role of Angiotensin receptor blockers. *Int J Hypertens* 2013;2013:941783.
- [6] Buratti L, Cagnetti C, Balucani C, Viticchi G, Falsetti L, Luzzi S, et al. Blood pressure variability and stroke outcome in patients with internal carotid artery occlusion. *J Neurol Sci* 2014;339(1–2):164–8.
- [7] Lattanzi S, Carbonari L, Pagliariccio G, Bartolini M, Cagnetti C, Viticchi G, et al. Neurocognitive functioning and cerebrovascular reactivity after carotid endarterectomy. *Neurology* 2018;90(4):e307–15.
- [8] Zangari R, Zanier ER, Torgano G, Bersano A, Beretta S, Beghi E, et al., LEPAS Group. Early ficolin-1 is a sensitive prognostic marker for functional outcome in ischemic stroke. *J Neuroinflammation* 2016;13:16.
- [9] Lattanzi S, Bartolini M, Provinciali L, Silvestrini M. Glycosylated hemoglobin and functional outcome after acute ischemic stroke. *J Stroke Cerebrovasc Dis* 2016;25(7):1786–91.
- [10] Liu X, Xu G, Liu Y, Zhu W, Ma M, Xiong Y, et al., BEST Trial Investigators. Acute basilar artery occlusion: Endovascular Interventions versus Standard Medical Treatment (BEST) Trial – design and protocol for a randomized, controlled, multicenter study. *Int J Stroke* 2017;12(7):779–85.
- [11] van der Hoeven EJ, Schonewille WJ, Vos JA, Algra A, Audebert HJ, Berge E, et al., BASICS Study Group. The Basilar Artery International Cooperation Study (BASICS): study protocol for a randomised controlled trial. *Trials* 2013;14:200.

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