

## SUMMARY

**Background:** Acute ischemic strokes (AIS) remain among the leading causes of adult morbidity, mortality and disability worldwide. A historically older recanalization method is intravenous thrombolysis (IVT) with the administration of recombinant tissue plasminogen activator. An essential and privileged therapeutic method in large vessel occlusion (LVO) strokes is mechanical thrombectomy, which has a higher chance of complete recanalization and leads to better clinical outcome compared to IVT alone.

**Aims:** 1) To investigate the impact of initial presentation of AIS symptoms and the affected vascular territory [posterior circulation stroke (PCS) vs. anterior circulation stroke (ACS)] on recanalization times in patients treated with IVT only and with endovascular treatment (EVT) ± IVT; 2) To evaluate the dependency of 90-day clinical outcome on the initial presenting AIS symptoms, achieved recanalization times as well as on the degree of achieved recanalization in patients treated with IVT and EVT (± IVT); 3) To evaluate the occurrence of parenchymal hematoma (PH) and 90-day clinical outcome after IVT in PCS vs. ACS patients, as well as in the particular subgroups with and without LVO.

**Methods:** 1) During a retrospective, observational, single-center study, prospectively collected data of AIS patients aged ≥ 18 years and treated with IVT only or EVT (± IVT) between 1 January 2013 and 31 December 2018 were analyzed; 2) In a retrospective, observational study a consecutive series of adult AIS patients treated with IVT or EVT (± IVT) at a single center during the 5-year period was reviewed retrospectively; 3) In an observational, cohort multicenter study, we analyzed data of AIS patients treated with IVT, prospectively collected in the SITS (Safe Implementation of Treatments in Stroke) registry in the Czech Republic between 2004–2018.

**Results:** 1) The set consisted of 809 AIS patients. Regarding the IVT-only group, increasing the National Institutes of Health Stroke Scale (NIHSS) score on admission and speech difficulties were associated with shorter ( $p = 0,036$  and  $0,004$ ) and nausea/vomiting with longer ( $p = 0,001$ ) onset-to-needle times, and vertigo with longer ( $p = 0,026$ ) door-to-needle times (DNT). In the EVT (± IVT) group, coma was associated with longer DNT ( $p = 0,0002$ ), ACS with shorter onset-to-groin time ( $p = 0,005$ ), and drooping of the mouth corner with shorter door-to-groin time ( $p = 0,0006$ ); 2) The set comprised 809 AIS patients. In the IVT group, age, neurological deficit on admission and hemiparesis were identified as independent negative predictors of good 90-day outcome. In the EVT (± IVT) group, increasing age and neurological deficit on admission were independent negative predictors, and successful recanalization was independent positive predictor of good 90-day clinical outcome ( $p < 0,05$  in all cases); 3) A total of 10211 patients were enrolled. PH was less frequent in PCS vs. ACS patients – 3,6 vs. 5,9 % ( $p = 0,001$ ) in the whole set, 4,4 vs. 7,8 % ( $p = 0,013$ ) in patients with LVO and 2,2 vs. 4,7 % ( $p = 0,0289$ ) in a subgroup of patients without LVO. At 90 days, PCS vs. ACS patients achieved more frequently excellent clinical outcome (55,5 vs. 47,6 %,  $p < 0,0001$  in the whole set and 49,2 vs. 37,6 %,  $p = 0,0045$  with LVO), good clinical outcome (69,9 vs. 62,8 %,  $p < 0,0001$  in the whole set and 64,5 vs. 50,5 %,  $p = 0,0041$  with LVO) and had lower mortality (12,4 vs. 16,6 %,  $p = 0,0003$  in the whole set and 18,4 vs. 25,5 %,  $p = 0,0129$  with LVO).

**Conclusion:** 1) Recanalization treatment was initiated later in AIS patients with less specific presenting symptoms associated with posterior circulation; 2) We confirmed the dependency of 90-day clinical outcome on age and the severity of the neurological deficit at admission according to the NIHSS score in patients with AIS treated with both IVT and EVT ± (IVT), and in the EVT (± IVT) group also the dependency of good 90-day outcome on the achievement of successful recanalization; 3) An extensive analysis showed, that PCS was associated with a significantly lower risk of PH both in patients with and without LVO, with higher rates of excellent and good clinical outcome, and decreased mortality 90 days after IVT in patients with LVO.