Impact of blood pressure levels within first 24 hours after mechanical thrombectomy on clinical outcome in acute ischemic stroke patients

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Background and purpose: Despite technical success and early management of mechanical thrombectomy (MT) for acute ischemic stroke (AIS), not all treated patients reach a good clinical outcome. Different factors may have impact on outcome and some of them are still not enough established. Blood pressure (BP) is considered very important for recanalization therapy, however limited data are available about its impact on MT [1-3]. Thus, we aimed to assess the influence of BP in first 24 hrs after MT on clinical outcome.

Methods: All consecutive AIS patients treated with MT using stent-retrievers were enrolled in the retrospective bi-center study. Neurological deficit was assessed with National Institutes of Health Stroke Scale (NIHSS) and clinical outcome after 3 months with modified Rankin scale (mRS) with a score 0-2 for good outcome. Recanalisation was rated using the Thrombolysis in Cerebral Infarction (TICI) scale. Presence of symptomatic intracerebral hemorrhage (SICH) was assessed according to the SITS- MOST criteria. BP levels within first 24 hours after MT were collected as 24 values of systolic BP (SBP) and diastolic (DBP) recorded each hour during ICU stay.

Results: Of 703 treated patients, completed BP levels were collected in 690 patients (350 males, mean age 71 ± 12 years) with a median of admission NIHSS 17 points (Table 1). The recanalization (TICI 2b-3) was reached in 551 (80%) and complete in 444 (64%) patients. 331 (48%) patients reached a good 90day clinical outcome (mRS 0-2) and had significantly lower median of systolic BP (SBP) compared to patients with poor outcome (130.5 vs. 140.0 mm Hg, p<0.0001) (Table 2). Similarly in the subgroup of patients with achieved recanalization (TICI 2b-3) and with complete recanalization (TICI 3), patients with good outcome had lower median of SBP (130.0 vs. 139.8 mm Hg, p<0.0001). Multivariate logistic regression analysis showed median of SBP (p< 0.0001; 95% CI: 0.965 - 0.987) median of maximal measured SBP (p< 0.0001; 95% CI: 0.972 - 0.987) and median of DBP (p=0.006; 95% CI: 0.972 - 0.995) within first 24 hours after MT as predictors of good clinical outcome after MT

Conclusion: Strict correction of blood pressure within first 24 hrs after MT seems to may have a positive impact on clinical outcome in treated patients.

References:

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2. Goyal N, et al. Neurology 2017; 89(6): 540-547. doi: 10.1212/WNL.0000000000004184.
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Table 1. Patients demographic and baseline characteristics.

N (males, %)	690 (51 %)
Age (years, mean ± SD)	71.0 ± 12.5
Admission NIHSS - median (range)	17.0 (1 – 42)
Hypertension (n, %)	525 (76 %)
Diabetes mellitus (n, %)	188 (27 %)
Ischemic cardiopathy (n, %)	191 (28 %)
Hyperlipidemia (n, %)	297 (43 %)
Atrial fibrillation (n, %)	299 (43 %)
MCA occlusion (n, %)	567 (82 %)
ICA occlusion (n, %)	160(23 %)
BA occlusion (n, %)	84 (12 %)

BA = basilar artery, ICA = internal carotid artery, MCA = middle cerebral artery, NIHSS = National Institute of Health Stroke Scale

Table 2. Comparison of BP levels between patients with good and poor outcome

		Patients with mRS 3-6	Patients with mRS 0-2	p
SBP median (mmHg)	Mean	138.5	132.5	< 0.0001
	SD	16.1	15.1	
	Median	140.0	130.5	
	Percentile 25	128	120	
	Percentile 75	150	144	
DBP median (mmHg)	Mean	69.8	68.6	0.094
	SD	9.8	9.2	
	Median	70.0	69.8	
	Percentile 25	63	60	
	Percentile 75	76	75	

SBP= Systolic blood pressure, DBP= Diastolic blood pressure, mRS= modified Rankin Scale

Table 3. Logistic regression analysis of BP levels for prediction of good clinical outcome after MT

	Sig.	OR	95% CI for OR	
			Lower	Upper
SBP median	< 0.0001	0.976	0.965	0.987
DBP median	0.180	0.988	0.971	1.006
SBP max	< 0.0001	0.980	0.972	0.987
SBP min	0,366	1,005	0,995	1,014
DBP max	0,006	0,984	0,972	0,995
DBP median	0,488	1,006	0,989	1,024

SBP= Systolic blood pressure, DBP= Diastolic blood pressure