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Reorganization of cerebral hemodynamics in patients with arteriovenous malformations

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Background and aims: Although there are many works devoted to this problem, particularities of cerebral hemodynamic in patients with arteriovenous malformations (AVM) are poorly described.

Aims: Research the influence of arteriovenous shunting at the reorganization of cerebral hemodynamics in patients with AVM.

Methods: Between 2005 and 2016 years 357 consecutive patients with brain AVM were treated in Dnepropetrovsk regional hospital. We conducted a comprehensive clinical, neuropsychological and neuroimaging examination of this subjects.

Results: The relative increase of the linear velocity of blood flow (LBV) in the arteries feeding AVM was 143% (145.56±15.57 cm/s). Increasing of blood volume flowing through the AVM lead to significant increasing of total cerebral blood flow till 1679.05±448.03 ml\min (exceed normal range in 2 times). Lesion of autoregulation was found in 75% of patients with AVM during conducting of functional tests. During hyperventilation LBV decreased in average on 25±7.4% (significant lower (p 0.01) than normal). Response to hypercapnia was absent in 37.5%. Overshoot ratio in averaged 1.06±0.07. On computed tomography perfusion the cerebral blood flow (CBF) and cerebral blood volume (CBV) were markedly elevated within the AVM nidus. However, the perinidal areas demonstrated low CBF and CBV, suggestive of perinidal ischemia in follow areas: surrounding AVM-in 91.5%, remoted from AVM in the ipsilateral hemisphere-in 61% of cases; in the contralateral hemisphere - in 34.4%.

Conclusion: We have shown that features of cerebral gemodynamics depends on the structural and functional characteristics of AVM.

Disclosure: Nothing to disclose

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Low-dose versus standard-dose rtPA in acute ischemic stroke: An explorative single-centre study

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Background and aims: Low-dose rtPA is currently used in Japanese subjects (Yamaguchi, Stroke 2006) with acute ischemic stroke, while it was not shown to be non-inferior to standard dose in a recent trial involving predominantly Asian subjects (Anderson, NEJM 2016). We aimed to evaluate safety and efficacy of low-dose rtPA in a Caucasian cohort of acute stroke patients.

Methods: From our database, among 389 rtPA-treated patients we consecutively selected 19 subjects treated with low-dose rtPA ($\leq$0.75 mg/kg), matched by NIHSS score, age and onset-to-treatment time to 38 subjects treated with standard-dose rtPA (0.9 mg/kg). Primary efficacy outcome was defined by favourable 90-days functional outcome (mRS score$\leq$2). Secondary efficacy outcomes were NIHSS score and mRS at discharge. Safety outcome was the proportion of symptomatic ICH (according to SITS-MOST criteria) and death.

Results: Baseline clinical and demographic features were similar between groups. At discharge, low-dose rtPA patients had NIHSS and mRS scores comparable to control group (p=0.659; p=0.520). Good functional outcome occurred in 47.4% low-dose subjects vs. 52.6% in standard-dose group (p=0.925). In addition, the distribution of mRS scores at 90 days was not significantly different between the two treatment groups (p=0.987). The proportion of sICH and death similar as well (p=1.000).

Baseline clinical and demographic characteristics.

	rtPA dose		p-value
	Standard (N = 38)	Low (N = 19)	
Age (yr)	75.7 (12.12)	75.8 (9.85)	0.859
Gender: male	21/38 (55.3%)	7/19 (36.8%)	0.303
mRS score before stroke	0 (0)	0 (0)	0.939
NIHSS score at stroke onset	13.5 (11.5)	15 (11)	0.799
rtPA dose (mg/kg)	0.9 (0.01)	0.68 (0.12)	0.000
Estimated body weight (kg)	75 (10)	65 (18)	0.050
Time from onset to rtPA administration (min)	141 (57)	165 (46)	0.198
Additional endovascular treatment	4/38 (10.53%)	2/38 (10.5%)	1.000
Final diagnosis			0.243
Other cause of stroke	2/38 (5.3%)	2/19 (10.5%)	
Cardioembolism	17/38 (44.7%)	4/19 (21.1%)	
Dissection	0/38 (0.0%)	1/19 (5.3%)	
Large-artery occlusion	9/38 (23.7%)	3/19 (15.8%)	
Two or more causes	3/38 (7.9%)	1/19 (5.3%)	
Small-vessel disease	1/38 (2.6%)	1/19 (5.3%)	
Cryptogenic stroke	6/38 (15.8%)	7/19 (36.8%)	
Hypertension	26/38 (68.4%)	13/19 (68.4%)	1.000
Diabetes	4/38 (10.5%)	3/19 (15.8%)	0.887
Antiplatelet therapy at stroke onset	20/38 (52.6%)	7/19 (36.8%)	0.399
Dual antiplatelet therapy	1/38 (2.6%)	2/19 (10.5%)	0.529

mRS: modified Rankin Scale. *NIHSS*: National Institutes of Health Stroke Scale.
rtPA: recombinant tissue plasminogen activator.

For categorical variables, chi-squared test was performed. For numerical variables, Wilcoxon rank-sum test was performed; median and interquartile range are shown.

Table 1. Baseline clinical and demographic characteristics.