Predictors of Collateral Flow Pattern in Acute Ischemic Stroke after Proximal Middle Cerebral Arterial Occlusion in Brazil

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Background: The evaluation of good collateral flow pattern in acute ischemic stroke (AIS) by Computed Tomography Angiography predicts better functional outcome and is used to select acute patients with proximal occlusions to reperfusion therapy. Nevertheless, there are few studies that explored the predictors of good collateral status among stroke patients in Brazil. Objective: To evaluate the association between CS, clinical and demographic factors among subjects with MCA occlusion AIS admitted to a tertiary academic stroke center

Methods: We retrospectively analyzed all AIS patients in our prospective stroke registry from 2014 to mid-2017. All AIS patients undergoing computed tomography angiography within 12 hours of symptoms onset and a M1 Middle Cerebral Artery (MCA) +/- internal carotid occlusion were included. The collaterals vessel evaluation was performed using the Regional Leptomeningeal Collateral Score (rLMC), a 20-point CTA scale previously reported in literature. We evaluated the presence of atrial fibrillation, hypertension, diabetes, age, sex, NIH stroke scale, smoking, elitism, systolic and diastolic blood pressure, coronary artery disease, as possible factors associated with the rLMC score. Bad outcome at 90 days was assessed by modified Rankin Scale (mRS) by a certified investigator

Results: There were 1559 AIS in our prospective Stroke Register and 121 eligible patients (mean age 67 +/- 15; female 49.6%). Sixty-three (52.1%) received rTPA and twenty-two (18.2%) were submitted to mechanical thrombectomy. In univariate analysis, lower age (r=-3.13, p<0,001), lower NIH stroke scale (r=-2.24, p=0.013), lower systolic blood pressure (r=-2.27, p=0.013) and coronary artery disease (B=-2.67, p= 0,015) were associate with higher rLMC score. In multivariate linear regression, lower age (r= -0.6; P=0.006), lower NIH stroke scale (r=-0.11, p=-0.007) and coronary artery disease (B=2.67, p=0.015) were independent predictors of higher collateral score. Lower rLMC score was significantly correlated with worse modified Rankin Scale at 90 days (r= -2.46, p= 0008).

Conclusions: We have found an association between the collateral pattern profile and some patient characteristics such as age, baseline NIHSS, history of coronary artery disease. Further studies are necessary to explore the association between patterns of pial collateral flow and clinical outcomes after ischemic stroke in Brazil.