PREDICTORS OF MALIGNANT MIDDLE CEREBRAL ARTERY INFARCTION IN PATIENTS UNDERGOING ENDOVASCULAR TREATMENT FOR ACUTE ISCHEMIC STROKE

A. Davoli MD[1], F. Sallustio MD[1,2], S. Pizzuto[1], S. Di Legge[3]PhD, F. Alemseged[1] MD, M. Diomedi PhD[1,2], D. Toni MD[4], S. Mangiafico MD[5], A. Zini MD[6] MD, G. Pracucci MD[7], V. Saia PhD[7], M. Stefanini[8], S. Fabiano[8], C. A. Reale[8], R. Gandini[8] and P. Stanzione MD[1,2] for the Italian Registry of Endovascular Treatment in Acute Stroke

1Stroke center, Department of Neuroscience, University of Tor Vergata, Rome, Italy; 2Santa Lucia Foundation IRCCS, Rome, Italy; 3Centre Hospitalier Pay d'Aix, Aix-en-Provence, France; 4Department of Neurological Sciences, Sapienza University, Rome, Italy;5Interventional Neuroradiology Unit, Careggi University Hospital, Florence, Italy; 6Stroke Center, University of Modena and Reggio Emilia, Modena, Italy; 7Department of Neurological and Psychiatric Sciences, Careggi University Hospital, Florence, Italy; 8Interventional Radiology Unit, Department of Diagnostic Imaging, University of Tor Vergata, Rome, Italy

Background and purpose

Few data exist about the development of malignant middle cerebral artery infarction (MMI) among patients with acute ischemic stroke (AIS) after endovascular treatment (ET). Data from MR CLEAN trial [1] showed no difference between active and control arm in the rate of patients requiring hemicraniectomy whereas in the ESCAPE trial [2] intervention arm was associated with a lower rate of large infarction or MMI than control arm. Our purpose was to determine the relation between clinical and radiological predictors and occurrence of MMI in patients undergoing ET.

Methods

A retrospective analysis of potential predictors of MMI was performed. Classic vascular risk factors together with onset glicemia and systolic blood pressure, baseline NIHSS, pial collateral circulation on CT angiography (CTA) and conventional angiography (CA), ASPECTS on non contrast CT (NCT) and on source images CT angiography (SI-CTA), successful recanalization were analyzed to investigate possible association with MMI.
All variables with a possible association with MMI in univariate analysis were included in multivariable logistic regression analysis.

Results

	MMI (+)n=18	MMI (-) n=101	p-value
Baseline NIHSS (median)	21	19	0.03
N° device passagges (mean)	3.2	2.5	0.07
Glicemia at onset	164	126	0.001
Successful recanalization	13/18(72%)	90/101(89%)	0.06
TIMI(mean)	1.7	2.4	0.008
24 hs NIHSS	25	14	<0.001
sICH	14/18(77.5%)	9/101(8.9%)	<0.001
Fair Collaterals (CTA)	0%	63/101(62%)	<0.001
Fair collaterals (DSA)	0%	63/101(62%)	<0.001
CT ASPECTS (median)	6	8	0.004
CTA-SI ASPECTS (median)	2	5	<0.001

No difference in age, sex, classic vascular risk factors, rate of tandem lesion, stroke etiology, blood pressure, use of i.v. thrombolysis, thrombus lenght on CTA, onset to arterial puncture time, onset to recanalilzation time were found between the two groups.

Due to the small number of MMI logistic regression analysis was not possible.

Conclusions

In our single center experience:
1. In the pre-ET phase more severe clinical presentation, lower ASPECT score, expecially on CTA-SI, poor pial collaterals and higher glicemia on admission were associated with MMI in patients undergoing ET.
2. In the post-ET phase sICH , 24 hours dramatic clinical worsening and worst recanalization were associated with MMI; therefore reperfusion injury following recanalization doesn't seem to be a major determinant of MMI.
3. Further studies should investigate if patients with low ASPECT score and poor collaterals could benefit or worsen after ET.

Bibliography

1.Berkhemer O.A. et al; MR CLEAN Investigators. A randomized trial of intraarterial treatment for acute ischemic stroke. N Engl J Med. 2015 Jan 1;372(1):11-20. doi: 10.1056/NEJMoa1411587. Epub 2014 Dec 17. Erratum in: N Engl J Med. 2015 Jan 22;372(4):394.
2.Goyal M. et al; ESCAPE Trial Investigators. Randomized assessment of rapid endovascular treatment of ischemic stroke. N Engl J Med. 2015 Mar 12;372(11):1019-30. doi: 10.1056/NEJMoa1414905. Epub 2015 Feb 11. PubMed PMID: 25671798.