HEMISPHERIC LATERALITY AND CLINICAL OUTCOME IN REVASCAT POPULATION

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Background

A metaanalysis of recent endovascular trials have confirmed the benefit of mechanical thrombectomy (MT) in all ASPECT score strata (0-5, 6-8, 9-10) but the effect was marginal in the lowest scores.

Since hemispheric laterallity may have distinct influence on clinical outcome especially in anterior circulation large vessel occlusion strokes (aLVO),

We aimed to study whether ASPECT scores had different prognostic effects according to the affected hemisphere in acute aLVO stroke patients receiving MT.

Methods:

This is a secondary post hoc study of REVASCAT clinical trial. Favourable outcome (modified Rankin score ≤ 2 at 3 months) was compared between treatment groups adjusted for age, initial stroke severity (NIHSS), occlusion site, ASPECT score and laterality.

We analysed ASPECT strata and laterality by treatment interaction.

Results:

Out of 206 REVASCAT patients, 113 had infarcts on the right (RH) and 93 on the left hemisphere (LH).

Treatment effect was higher in RH patients (adjusted OR, 3.20;95% CI 1.21 to 8.62) than in LH patients (adjusted OR, 1.20;0.30 to 4.22) without significant interaction (p=0.26).

Treatment by ASPECT strata interaction was significant in the RH infarcts (p=0.010) but not in the LH ones (Figure 2).

Figure 1.- Volume in aspects strata (0-5, 6-8, 9-10) and in the whole sample by treatment effect interaction

Figure 2.- Forest plot showing adjusted treatment effect for mRS at 90 d. in subgroups (laterality and ASPECTS strata in Right and Left side), with p values for interaction. mRS=modified Rankin Scale, ASPECTS= Alberta Stroke Program Early CT score, aOR=adjusted Odds Ratio

Discussion:

The ASPECTS method, measures infarcted regions in MCA territory. Out of the ten regions the cortical ones have different clinical meaning depending on laterality. A recent publish paper suggested that not all ASPECTS regions have equal clinical importance. Right parietal lobe involvement or left frontal lobe involvement seem to be independently associated with poor outcome. So, infarct location and laterality, and not just infarct volume, impact clinical outcomes and provide additional prognostic value to aLVO patients

Conclusions:

- Treatment effect in REVASCAT was shown in both hemispheric infarcts.
- Right side lesions had higher odds of functional independence at three months and treatment effect significantly differed according to the ASPECT score.

Table 1. Baseline Characteristics, Occlusion site, Procedure description and Outcome variables according to hemispheric laterality

Variable	Right n=113	Left n=93	p value
Demographics			
- Age, mean, y	67±10.2	65.9±10.9	ns
- Male (%)	62 (54.9)	38 (36.9)	ns
NIHSS, median (P25,P75)	16 [12,18]	20 [16,22]	p 0.0001
Basal glycaemia, mean, g/l	7.2±1.7	7.2±2	ns
TOAST (%)			
- AT	17 (15)	22 (23.7)	
- CE	68 (60.2)	43 (46.2)	p 0.042
- UND	25 (22.1)	19 (20.4)	
Occlusion site (%)			
- TICA	27 (24.1)	27 (29.7)	
- MCA M1	74 (66.1)	57 (62.6)	ns
- MCA M2	11 (9.8)	7 (7.7)	
Prior tPA use (%)	85 (75.2%)	65 (69.9)	ns
Treatment Group (EVT) (%)	57 (50.4)	46(49.5)	ns
TOGP, mean	336.3±108	350.4±103	ns
Recanalization (TICI 2b/3)	37 (66.1)	30 (65.2)	ns
(%)			
ASPECTS (%)			ns
- Aspects 0-5	27 (23.9)	12 (12.9)	p 0.03
- Aspects 6-8	55 (48.7)	55 (59.1)	ns
- Aspects 9-10	31 (27.4)	26 (28)	ns
Outcome (%)			
- Infarct Volum(24-36h)*	67±103.7	71.8±103.7	ns
- mRS>2 at 3 month**	51 (45.1)	23 (24.7)	p 0.002

* infarct volume expressed as mean, cc; TICI, Thrombolysis in Cerebral Infarction; TICA, terminus internal carotid artery; MCA, media cerebral artery; TOGP, time from onset to groin puncture.