CT-RITMO Study: rate of infarction growth in acute stroke CT perfusion sequential studies

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BACKGROUND

- Cerebral infarction core can be assessed using CT-Perfusion cerebral blood volume maps(CBV-core). However, no study has evaluated the CBV-core changes during stroke progression yet.
- The CT-RITMO (CT-Perfusion Rate of Infarction growth in MCA Thrombectomy) study goal is to evaluate factors related to infarction growth in hyperacute stroke.

METHODS

- We conducted a retrospective study of consecutive patients with MCA territory acute stroke transferred between 2 stroke centers and undergoing endovascular treatment. CBV-core was estimated in sequential CT-Perfusion(CTP) studies (first CTP performed in the shipping center and a second one in the treatment center).
- Clinical and radiological variables were correlated with infarction growth.

RESULTS

CBV-core growth

Sex	54 % Female
Age (years, mean)	68,4
Baseline NIHSS (mean)	16,1 (SD :5,8)
Atrial Fibrillation	42 %
ASPECTS in CBV map (median)	8
Previous rt-PA	64 %
Time between TCP studies (mean)	111,4 min (SD: 40,2)
Time to recanalization (mean)	384 min (SD:179,4)
Successful recanalization (TICI >2a)	86%
CBV-core in first study (mean)	3,2 ml (SD: 4,6)
CBV-core in second study (mean)	8,7 ml (SD: 12,9)
CBV-core growth (mean)	3,5ml(SD: 4,6).
CBV-core growth velocity	0,03 ml/min (SD: 0,04)

Factors related to higher CBV-core growth

- Higher glycaemia, $Rho=0,33$; $p=0,03$
- Higher creatinine levels, $Rho=0,3$; $p=0,05$
- Higher baseline NIHSS $Rho=0,28$; $p=0,05$.

Factors related to lower CBV-core growth

- Better collateral circulation was related with lower infarction growth, $Rho=0,33$; $p=0,02$.

Baseline characteristics

Good Moderate Poor

Collateral circulation
(Christoforidis scale in CTASI)

CONCLUSIONS

- Our study suggests that CBV-core growth tends to be low but with a significant variability.
- Infarction growth was associated with factors already known as relevant in stroke, but our study points out their importance even for a short period of time in the hyperacute phase.