

Imaging Selection in Endovascular Stroke Trials

EXTEND-IA

Bruce Campbell

Baseline Imaging

Modality	Required or Optional	No. obtained (%)
CT non-contrast	R	70 (100%)
CT perfusion	R	70 (100%)
CT angiography	R	70 (100%)
MR diffusion	O	0
MR perfusion	O	0
MR angiography	O	0

Time to Treatment

	Mean (SD)	Median (IQR)
Multimodal CT acquisition time, min		6min28s (3min37s-9min0sec)
CTP post-processing time, min		5min20s (range 3-10min)
Multimodal MR acquisition time, min	N/A	N/A
PWI/DWI post-processing time, min	N/A	N/A
“Door-to-Groin” time, min		
for entire cohort (based on NCCT/CTP/CTA n=33)	120 (51)	109 (78-150)
for patients selected based on NCCT alone	N/A	N/A
for patients selected based on NCCT/CTA	N/A	N/A
for patients treated on-site (n=29)	113 (49)	95 (75-136)
for patients selected based on MRI	N/A	N/A

Selection Criteria

Criteria for	Description
Vessel Occlusion	ICA, M1, M2
Small Core	relCBF<30% threshold (RAPID), <70mL
Mismatch	ratio>1.2, absolute >10mL
Collaterals	N/A

Biases and Limitations

- Potential limitations related to imaging based patient selection:
 - chiefly potential for treatment effect outside the population studied
 - Selection criteria were followed
 - Selection criteria did not change during the study
 - NCCT would only have excluded from EXTEND-IA if changes were judged too extensive to give tPA – unusual <4.5h
 - Potential exclusion of: more distal M2 “not accessible”, older “not accessible”, rapid improvers – underestimate tPA effect?

Baseline Imaging Characteristics

Characteristic	Medical Treatment (n=35)	Endovascular Treatment (n=35)
Site of vessel occlusion – no. (%)		
ICA	11 (31%)	11 (31%)
MCA-M1	18 (51%)	20 (57%)
MCA-M2	6 (17%)	4 (11%)
Ischemic core volume - ml		
Mean (SD)	19.6 (17.4)	18.9 (18.5)
Median (IQR)	18 (4-29)	12 (4-32)
ASPECTS		
Mean (SD)	9.1 (1.0)	9.2 (0.86)
Median (IQR)	9 (9-10)	9 (9-10)
Perfusion volume - ml		
Mean (SD)	116 (48)	105 (39)
Median (IQR)	115 (72-158)	106 (76-137)
Other variables (eg collateral status)		

Subgroup Analysis

According to Baseline Imaging Characteristics

Example Criteria	Endovascular Tx		Medical Tx		OR (95% CI) for mRS 0-2	OR (95% CI) for CMH
	mRS 0-2	Total	mRS 0-2	Total		
Core	n	N	n	N		
<25 ml	18	24	11	25	5.9 (1.3-26.3)	1.28
25-70 ml	7	11	4	10	9.9 (0.62-160)	1.14
ASPECT						
8-10	25	34	13	32	4.5 (1.5-13.9)	1.27
5-7	0	1	1	3	-	
0-4	0	0	0	0		
Other criteria (eg collateral or mismatch status)						

Key Imaging Finding

- *reperfusion-outcome correlation exceptionally strong*

	Reperf >90%	Reperf <90%	p-value	`NNR`
NIHSS 8pt/0-1	38/43 (88%)	3/27 (11%)*	p<0.001	1.3
mRS 0-1	25/43 (58%)	3/27 (11%)	p<0.001	2.1
mRS 0-2	31/43 (72%)	8/27 (30%)	p<0.001	2.4
mRS 6	1/43 (2.3%)	9/27 (33%)	p=0.005	3.3
Ordinal unadj	OR 4.5 95%CI 2.2-9.0		p<0.001	1.6
Ordinal adj (age, NIHSS)	OR 5.1		p<0.001	1.5

*2/3 had >70% reperfusion (mRS 1 & 3)