

Supplementary Material

1 Supplementary Tables

Supplementary Table S1. Baseline Patient Characteristics in reperfusion therapy group and Comparison of Clinical Variables Stratified by Functional Outcome

No. of patients and characteristics	ALL n= 118(100%)	Favorable outcome n = 70(59%)	Unfavorable outcome n =48(41%)	P-value
Age, Median (IQR)	66 [55.2, 73]	64.5 [55, 72]	68.5 [56, 74.2]	0.275
Male, n (%)	94 (79.7)	58 (82.9)	36 (75)	0.419
Risk factors n (%)				
Hypertension, n (%)	76 (64.4)	44 (62.9)	32 (66.7)	0.819
Diabetes, n (%)	27 (22.9)	10 (14.3)	17 (35.4)	0.014
Hyperlipidemia, n (%)	38 (32.2)	25 (35.7)	13 (27.1)	0.432
Prior stroke, n (%)	23 (19.5)	13 (18.6)	10 (20.8)	0.946
Coronary artery disease, n (%)	21 (17.8)	13 (18.6)	8 (16.7)	0.983
Valvular disease, n (%)	23 (19.5)	10 (14.3)	13 (27.1)	0.137
Chronic heart failure, n (%)	7 (5.9)	3 (4.3)	4 (8.3)	0.44
Atrial fibrillation, n (%)	26 (22)	10 (14.3)	16 (33.3)	0.026
Smoke, n (%)	42 (35.6)	27 (38.6)	15 (31.2)	0.535
Drink, n (%)	22 (18.6)	16 (22.9)	6 (12.5)	0.239
Homocysteine, Median [IQR]	12.8 [10, 16.5]	12.2 [10, 16.2]	13.1 [10.1, 17]	0.35
SBP, Median [IQR]	143.5 [129, 162]	145.5[128, 162]	140[130, 160]	0.724
DBP, Median [IQR]	85 [76, 96]	86 [76, 98]	82.5 [74, 90]	0.348
HR, Median [IQR]	80 [71, 88]	79 [70, 86]	81 [75, 96]	0.16
Blood Glucose, Median [IQR]	5.8 [5.2, 7.2]	5.6 [4.8, 6.7]	6.4 [5.7, 8.5]	< 0.001
Glycosylated hemoglobin, Median[IQR]	5.8 [5.5, 6]	5.7 [5.4, 5.9]	5.9 [5.6, 6.5]	0.007
Time to CT(min) ,Median[IQR]	480[276, 744]	480[270, 744]	480[300, 732]	0.943
Baseline NIHSS, Median[IQR]	11[7, 17]	8[6, 14]	15 [10, 19]	< 0.001
Imaging items				
ASPECTS on NCCT, Median[IQR]	7[6, 8]	8[7, 8]	6[5, 7]	< 0.001
Location of occlusion on mCTA, n (%)				0.899
ICA or Tandem	39 (33.1)	24 (34.3)	15 (31.2)	
M1	56 (47.5)	32 (45.7)	24 (50)	
M2 or further distal	23 (19.5)	14 (20)	9 (18.8)	
mCTA score, n (%)				0.003
1	4 (3.4)	0 (0)	4 (8.3)	
2	8 (6.8)	2 (2.9)	6 (12.5)	
3	64 (54.2)	36 (51.4)	28 (58.3)	
4	35 (29.7)	27 (38.6)	8 (16.7)	
5	7 (5.9)	5 (7.1)	2 (4.2)	
Good collaterals (4-5)	42(35.6)	32(45.7)	10(20. 8)	
Poor collaterals (1-3)	76(64.4)	38(54.3)	38(79.2)	
mCTA score , Median [IQR]	3[3, 4]	3[3, 4]	3[2, 3]	< 0.001
ischemic core volume(rCBF<30%) (mL), Median [IQR]	4.5[1.8, 15.4]	2.2[1.1, 5.5]	12.6[5.2, 30.4]	< 0.001
Mismatch ratio, Median [IQR]	15.8[6, 40.4]	23.1[11.7, 55.8]	7[4.3, 19.1]	< 0.001
TMax>6s volume(mL), Median [IQR]	82.6[55.4, 126.4]	70.2[43.4, 97.8]	99.8[72.4, 167.8]	< 0.001
TMax>10s volume(mL), Median [IQR]	18.2[6.8, 37.6]	7.7[4.4, 17.5]	38.8[28.2, 67]	< 0.001
HIR, Median [IQR]	0.2[0.1, 0.4]	0.1[0.1, 0.2]	0.4[0.3, 0.4]	< 0.001
FIV, Median [IQR]	20.6[8.6, 73.2]	12.1[7.4, 17.6]	87[43.4, 166]	< 0.001
Type of treatment, n (%)				0.358
Intravenous thrombolysis	31 (26.3)	19 (27.1)	12 (25)	
Bridging therapy	14 (11.9)	7 (10)	7 (14.6)	
EVT	73 (61.9)	44 (62.9)	29 (60.4)	
90d_mRS, Median [IQR]	2[1, 4]	1[0, 2]	4[3, 5]	< 0.001

Supplementary Table S2. Baseline Patient Characteristics in IVT and EVT group and Comparison of Clinical Variables Stratified by Functional Outcome

No. of patients and characteristics	IVT			EVT		
	Favorable outcome n = 19(61.3%)	Unfavorable outcome n =12(38.7%)	P-value	Favorable outcome n = 51(58.6%)	Unfavorable outcome n =36(41.4%)	P-value
Age	62[58.5, 71]	69.5 [54, 75]	0.405	66[51.5, 72]	68 [56, 74]	0.41
Male, n (%)	16 (84.2)	7 (58.3)	0.206	42 (82.4)	29 (80.6)	1
Blood Glucose	5.2[4.6, 5.7]	6.1 [5.0, 6.9]	0.054	5.8[5.1, 7.3]	6.5[5.8, 8.6]	0.008
Time to CT(min)	240[180, 372]	288[150, 300]	0.568	570[360, 870]	648[414, 780]	0.746
Baseline NIHSS	7[5, 10]	15 [9, 17]	0.003	10[7, 16]	16 [10, 20]	0.003
ASPECTS	8[8, 8]	6[6, 7]	< 0.001	7[7, 8]	6[5, 7]	< 0.001
Location of occlusion			0.053			0.246
ICA or Tandem	9(47.4)	3 (25)		15(29.4)	12 (33.3)	
M1	9(47.4)	4 (33.3)		23(45.1)	20 (55.6)	
M2	1(5.3)	5(41.7)		13(25.5)	4(11.1)	
mCTA score, n (%)			0.04			0.037
1	0 (0)	1(8.3)		0 (0)	3(8.3)	
2	0 (0)	0(0)		2 (3.9)	6(16.7)	
3	7 (36.8)	9 (75)		29 (56.9)	19 (52.8)	
4	9 (47.4)	1(8.3)		18 (35.3)	7(19.4)	
5	3(15.8)	1 (8.3)		2(3.9)	1 (2.8)	
Good collaterals(4-5)	12(63.2)	2(16.7)		20(39.2)	8(22.2)	
Poor collaterals(1-3)	7(36.8)	10(83.3)		31(60.8)	28(77.8)	
mCTA score	4[3, 4]	3[3, 3]	0.043	4[3, 4]	3[3, 3]	0.04
rCBF<30%)(mL)	1.6[0.6, 3.8]	11.2[6.0, 28.3]	< 0.001	2.5[1.2, 6.5]	12.9[5.2, 30.4]	< 0.001
Mismatch ratio	17[13.1,26.9]	7.6[3, 15.9]	0.024	27.6[10.8,58.9]	7.0[4.4, 19.1]	< 0.001
TMax>6s (mL)	29.2[19.5, 72.3]	70.8[66.1, 95.8]	0.012	79.4[55.8, 114]	117.9[84, 184.7]	0.001
TMax>10s (mL)	3.8[2, 8.8]	30.8[26.4, 37.1]	< 0.001	8.9[5.5, 21.2]	40[31.3, 78.2]	< 0.001
HIR	0.2[0.1, 0.2]	0.4[0.4, 0.5]	< 0.001	0.1[0.1, 0.2]	0.4[0.3, 0.4]	< 0.001
FIV	8.4[5.8, 16.1]	74.7[56.2, 142.9]	< 0.001	12.8[8, 22.4]	99.2[36.6, 169.2]	< 0.001
90d_mRS	1[0, 1]	4[3, 4]	< 0.001	1[0, 2]	4[3, 5]	< 0.001

Values in parentheses represent percentage of patients (%); brackets represent first and third quartiles, respectively.

Abbreviations: NIHSS, National Institutes of Health Stroke Scale; ASPECTS, Alberta Stroke Program Early Computed Tomography Score; mCTA, multiphase CTA; rCBF, relative cerebral blood flow; TMax, the time when the residue function reaches its maximum; HIR, hypoperfusion intensity ratio.

Supplementary Table S3. Baseline Patient Characteristics in supportive medical treatment group and Comparison of Clinical Variables Stratified by Functional Outcome

No. of patients and characteristics	ALL n= 117(100%)	Favorable outcome n = 57(48.7%)	Unfavorable outcome n =60(51.3%)	P-value
Age, Median (IQR)	65 [56, 72]	65 [55, 70]	65.5 [56.8, 74.2]	0.606
Male, n (%)	84 (71.8)	45 (78.9)	39 (65)	0.142
Risk factors n (%)				
Hypertension, n (%)	99 (84.6)	46 (80.7)	53 (88.3)	0.375
Diabetes, n (%)	34 (29.1)	16 (28.1)	18 (30)	0.979
Hyperlipidemia, n (%)	55 (47)	27 (47.4)	28 (46.7)	1
Prior stroke, n (%)	30 (25.6)	13 (22.8)	17 (28.3)	0.637
Coronary artery disease, n (%)	21 (17.9)	14 (24.6)	7 (11.7)	0.115
Valvular disease, n (%)	20(17.1)	7 (12.3)	13 (21.7)	0.27
Chronic heart failure, n (%)	13 (11.1)	4 (7)	9 (15)	0.281
Atrial fibrillation, n (%)	21 (17.9)	7 (12.3)	14 (23.3)	0.188
Smoke, n (%)	40 (34.2)	23 (40.4)	17 (28.3)	0.24
Drink, n (%)	14 (12)	6 (10.5)	8 (13.3)	0.855
Homocysteine, Median [IQR]	13.3 [10.8, 16.3]	13.3[10.8, 16.2]	13.3 [10.9, 16.6]	0.952
SBP, Median [IQR]	150 [133, 167]	142[130, 169]	152[137.5, 164]	0.39
DBP, Median [IQR]	89 [80, 96]	88 [80, 95]	89 [80,99]	0.466
HR, Median [IQR]	78 [74, 90]	78 [72, 86]	80 [74, 97]	0.09
Blood Glucose, Median [IQR]	6 [5.2, 8.1]	5.6 [5.1, 7.1]	6.6 [5.7, 8.5]	0.037
Glycosylated hemoglobin, Median[IQR]	5.9[5.6, 6.4]	5.9 [5.7, 6.5]	5.8 [5.4, 6.4]	0.051
Time to CT(min) ,Median[IQR]	690[450, 1020]	630[420, 900]	750[474, 1080]	0.114
Baseline NIHSS, Median[IQR]	10[4, 15]	5[3, 10]	14 [8, 19]	< 0.001
Imaging items				
ASPECTS on NCCT, Median[IQR]	7[6, 7]	7[7, 8]	6[4, 7]	< 0.001
Location of occlusion on mCTA, n (%)				0.414
ICA or Tandem	44 (37.6)	21 (36.8)	23 (38.3)	
M1	48 (41)	21 (36.8)	27 (45)	
M2 or further distal	25(21.4)	15 (26.3)	10 (16.7)	
mCTA score, n (%)				< 0.001
1	16 (13.7)	0 (0)	16 (26.7)	
2	9 (7.7)	0 (0)	9 (15)	
3	53 (45.3)	27 (47.4)	26 (43.3)	
4	28 (23.9)	19 (33.3)	9 (15)	
5	11 (9.4)	11 (19.3)	0 (0)	
Good collaterals (4-5)	39(33.3)	30(52.6)	9(15)	
Poor collaterals (1-3)	78(66.7)	27(47.4)	51(85)	
mCTA score , Median [IQR]	3[3, 4]	3[3, 4]	3[2, 3]	< 0.001
ischemic core volume(rCBF<30%)(mL), Median [IQR]	4.8[1.7, 26.9]	1.8[0.9, 3.4]	16.9[6.4, 54.7]	< 0.001
Mismatch ratio, Median [IQR]	10.8[3.3, 28.1]	22.9[12.2, 39.8]	3.8[1.7, 11.3]	< 0.001
TMax>6s volume(mL), Median [IQR]	66.8[38.7, 117.9]	42.8[27.4, 66.8]	95.7[66.3, 138.9]	< 0.001
TMax>10s volume(mL), Median [IQR]	17.5[5.3, 41.7]	5.3[2.8, 12.2]	41.2[23.6, 63.4]	< 0.001
HIR, Median [IQR]	0.3[0.1, 0.4]	0.2[0.1, 0.2]	0.4[0.4, 0.5]	< 0.001
FIV, Median [IQR]	29.3[12.6, 78.4]	13.8[7.9, 20]	77.3[45.2, 156.3]	< 0.001
90d_mRS, Median [IQR]	3[2, 4]	2[1, 2]	4[3, 4]	< 0.001

Values in parentheses represent percentage of patients (%); brackets represent first and third quartiles, respectively.

Abbreviations: SBP, systolic pressure; DBP, diastolic blood pressure; HR, heart rate; NIHSS, National Institutes of Health Stroke

Scale; ASPECTS, Alberta Stroke Program Early Computed Tomography Score; NCCT, unenhanced CT; mCTA, multiphase

CTA;ICA, internal cerebral artery; rCBF, relative cerebral blood flow; TMax, the time when the residue function reaches its maximum;

HIR, hypoperfusion intensity ratio; FIV, follow-up infarct volume; EVT, endovascular thrombectomy; mRS, modified Rankin scale.

Supplementary Table S4. Multivariable logistic regression analysis for functional outcome in different type of treatment arm

Variables	reperfusion treatment group (n=118) aOR (95% CI)	<i>p</i> -value	Supportive medical treatment group(n=117) aOR (95% CI)	<i>p</i> -value
Age	1 (0.91-1.09)	0.924	1 (0.92-1.09)	0.935
Gender	0.9 (0.05-15.78)	0.944	0.34 (0.03-3.91)	0.386
Blood Glucose	1.48 (0.99-2.23)	0.058	1.12 (0.78-1.6)	0.547
NIHSS	1.18 (0.98-1.43)	0.086	1.05 (0.86-1.28)	0.616
ASPECTS	0.58 (0.18-1.9)	0.37	0.27 (0.06-1.1)	0.068
mCTA score	0.2 (0.03-1.48)	0.117	0.48 (0.11-2.22)	0.349
rCBF<30%	0.93 (0.87-1)	0.054	1 (0.91-1.09)	0.914
TMax > 6s	1 (0.99-1.02)	0.903	1 (0.98-1.02)	0.949
HIR (per 0.01)	1.55 (1.21-1.98)	<0.001	1.31 (1.14-1.5)	<0.001

we adjusted age, Gender , blood glucose, NIHSS,ASPECTS, mCTA score, rCBF<30% , TMax > 6s

Abbreviations: NIHSS, National Institutes of Health Stroke Scale; ASPECTS, Alberta Stroke Program Early Computed Tomography Score; mCTA, multiphase CTA; rCBF, relative cerebral blood flow; TMax, the time when the residue function reaches its maximum; HIR, hypoperfusion intensity ratio.

Supplementary Table S5. Multivariable logistic regression analysis for functional outcome in EVT group

Variables	EVT group(n=87)			
	Crude OR, 95%CI	<i>p</i> -value	aOR, 95%CI	<i>p</i> -value
Age	1.01 (0.98-1.05)	0.44		
Gender	1.13 (0.38-3.37)	0.831		
Blood Glucose	1.12 (0.96-1.3)	0.137		
NIHSS	1.11 (1.03-1.19)	0.004	1.14 (0.96-1.34)	0.13
ASPECTS	0.47 (0.3-0.71)	<0.001	0.65 (0.21-2.04)	0.457
mCTA score	0.42 (0.22-0.81)	0.009	0.21 (0.03-1.51)	0.12
rCBF<30%	1.05(1.01-1.08)	0.006	0.97 (0.92-1.01)	0.166
TMax > 6s	1.01 (1 -1.02)	0.006	0.94 (0.87-1.01)	0.083
HIR (per 0.01)	1.32 (1.17-1.48)	<0.001	1.49 (1.18-1.88)	<0.001

Crude model: no other covariates were adjusted.

Adjusted model: we adjusted NIHSS, ASPECTS, mCTA score, rCBF<30% , Tmax > 6s

Supplementary Table S6. Correlation between HIR , mCTA with Functional Outcome in different subgroup

Variable	Functional Outcome(90-d mRS)									
	Total (n=235)	<i>p</i> -value	group 1 (n=118)	<i>p</i> -value	group 2 (n=117)	<i>p</i> -value	group 3 (n=117)	<i>p</i> -value	group 4 (n=117)	<i>p</i> -value
HIR	0.8519	<i>P</i> <0.0001	0.8413	<i>P</i> <0.0001	0.8801	<i>P</i> <0.0001	0.8714	<i>P</i> <0.0001	0.8477	<i>P</i> <0.0001
mCTA	- 0.4657	<i>P</i> <0.0001	- 0.3269	<i>P</i> =0.0003	- 0.6049	<i>P</i> <0.0001	- 0.4561	<i>P</i> =0.0003	- 0.466	<i>P</i> <0.0001

group 1 reperfusion treatment; group 2 Supportive medical treatment; group 3 early time window(<6h); group 4 late time window(6-24h)