

rt- PA

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Advances in mechanism of intracranial hemorrhage and transformation after intravenous thrombolysis treatment with rt- PA HE Zi-long MA Guo-zhong CUI Fang, Department of Neurology Hainan Branch PLA General Hospital Sanya 572031 China

Keywords Ischemic stroke rt- PA Intravenous thrombolysis Intracranial hemorrhage transformation Reviews

Plasminogen Activator (Recombinant Tissue Plasminogen Activator) rt- PA

(ECASS) (NINDS) 2014 rt- PA

rt- PA

rt- PA

1

(7 d)

ECASS

ECASS (Hemorrhagic Infarcts HI) (Parenchymal Hematomas PH)

HI PH

PH

PH

3 4

(Symptomatic Intracerebral Hemorrhage sICH) (Non- symptomatic Hemorrhage ICH) sICH

NINDS ECASS

(SITS- MOST) 3 6

ECASS

1 7

()

22 h-7 d¹

rt- PA 27.5%⁷

NINDS

5 min

rt- PA

24 h 80%

12 h

24 h

2

NINDS ECASS

BBB)
rt- PA

rt- PA

-

14-15

BBB
HI

PH

4

()

PH

CT

8-9

sICH

(Cerebral Amyloid Angiopathy CAA)

CAA rt- PA

70%

¹⁰⁻¹¹

22%

CAA

(Cerebral Microbleeds CMB)

CAA

rt- PA

16-17

Meta

CMB

sICH

(RR)

1.90(95% CI=0.92~3.93)

P=0.08)⁴

Kimura

¹²

CMB

CMB

24 h

SITS GRAPSPS SEDAN HAT

CMB

sICH

7

HINSS

Mehta ¹³

C (C- statistic)

C

0.62~0.70

rt- PA

2

18-20

BBB

BBB

3 rt- PA

BBB

HI PH

ECASS-I

rt- PA

36 h

30%

13%
 rt- PA
 21
 rt- PA
 (1)rt- PA
 rt- PA
 rt- PA
 (2)rt- PA
 PH
 rt- PA
 PH
 rt- PA
 rt- PA
 22
 rt- PA
 rt- PA
 BBB
 (LDL
 Receptor- related Protein LRP)
 C(Derived Growth Factor C) N-
 (N- methyl- d- aspartate NMDA)NR1
 rt- PA
 rt- PA
 23-27
 BBB
 BBB
 28
 rt- PA
 (Matrix Metalloproteinase MMP)
 MMP- 9
 MMP
 BBB
 14 26 28
 BBB
 rt- PA
 rt- PA
 1
 J .

2013 8(3):190- 196

- 2 Vandelli L Marietta M Gambini M et al. Fibrinogen decrease after intravenous thrombolysis in ischemic stroke patients is a risk factor for intracerebral hemorrhage J . J Stroke Cerebrovasc Dis 2015 24(2):394- 400
- 3 Kase CS Furlan AJ Wechsler LR et al. Cerebral hemorrhage after intra- arterial thrombolysis for ischemic stroke: the PROACT II trial J . Neurology 2001 57(9):1 603- 1 610
- 4 lvarez- Sabín J Maisterra O Santamarina E et al. Factors influencing haemorrhagic transformation in ischaemic stroke J . Lancet Neurol 2013 12(7):689- 705
- 5 Larue V von Kummer RR Müller A et al. Risk factors for severe hemorrhagic transformation in ischemic stroke patients treated with recombinant tissue plasminogen activator: a secondary analysis of the European- Australasian Acute Stroke Study (ECASS II) J . Stroke 2001 32(2):438- 441.
- 6 Wahlgren N Ahmed N Dávalos A et al. Thrombolysis with alteplase for acute ischaemic stroke in the Safe Implementation of Thrombolysis in Stroke- Monitoring Study (SITS- MOST): an observational study J . Lancet 2007 369:275- 282
- 7 Strbian D Sairanen T Meretoja A et al. Patient outcomes from symptomatic intracerebral hemorrhage after stroke thrombolysis J . Neurology 2011 77(4):341- 348
- 8 Mazya M/ Ahmed N Ford GA et al. Remote or extracerebral intracerebral hemorrhage - an uncommon complication of stroke thrombolysis: results from the safe implementation of treatments in stroke- international stroke thrombolysis register J . Stroke 2014 45(6):1 657- 1 663
- 9 O' Carroll CB Aguilar MI. Management of Postthrombolysis Hemorrhagic and Orolingual Angioedema Complications J . Neurohospitalist 2015 5(3):133- 141.
- 10 Winkler DT Biedermann L Tolnay M et al. Thrombolysis induces cerebral hemorrhage in a mouse model of cerebral amyloid angiopathy J . Ann Neurol 2002 51(6):790- 793
- 11 Charidimou A Shoamanesh A Wilson D et al. Cerebral microbleeds and postthrombolysis intracerebral hemorrhage risk Updated meta- analysis J . Neurology 2015 85(11):924- 927.
- 12 Kimura K Aoki J Shibasaki K et al. New appearance of extracerebral microbleeds on T2*- weighted magnetic resonance imaging 24 hours after tissue- type plasminogen active administration J . Stroke 2013 44(10):2 276- 2 281.
- 13 Mehta RH Cox M Smith EE et al. Race/Ethnic differences in the risk of hemorrhagic complications among patients with ischemic stroke receiving thrombolytic therapy J . Stroke 2014 45(8):2 263- 2 269.
- 14 J . 2006 1(12):904- 906
- 15 Simard JM Kent TA Chen M et al. Brain oedema in focal ischaemia: molecular pathophysiology and theoretical implications J . Lancet Neurol 2007 6(3):258- 268
- 16 J . 2016 22(23):4 649- 4 653
- 17 Sommer CJ. Ischemic stroke: experimental models and reality J . Acta Neuropathol 2017 133(2):245- 261.
- 18 Lo WT Cheung CY Li CK et al. Thrombolysis in chinese ischemic stroke patients with renal dysfunction J . Interv Neurol 2015 3(2):101- 106

