

“No Time to Die” – Saving the Neurons

Harsh Sapra 

Keywords: Door-to-needle time, Stroke, Thrombolysis.

Indian Journal of Critical Care Medicine (2022); 10.5005/jp-journals-10071-24221

Stroke is the second leading cause of death and third leading cause of disability across the globe.¹ It's often repeated, “Time is Brain.” The ultimate goal in the early management of acute ischemic stroke is to be able to administer thrombolytic therapy to all eligible patients in a time-bound manner. The benefit of this therapy is time-dependent. International guidelines recommend a minimum door-to-needle (DTN) time of <60 minutes as the mode to effectively salvage the insulted brain for an improved clinical outcome and reduced morbidity and mortality.²

Each minute of onset-to-treatment time saved granted an average 1.8 days of extra healthy life to stroke patients.³ Pooled analysis from various trials of ATLANTS, ECASS, and NINDS rt-PA stroke trials showed that sooner the rt-PA administration the greater the benefit in terms of improved recovery and decreased morbidity.⁴

Tong et al.⁵ conducted a study collecting data based on the Paul Coverdell National Acute Stroke Program over 10 years from 2008 to 2017. Decreasing DTN time to ≤45 minutes for at least 50% of patients was found to be associated with decreases in adverse events from thrombolysis or in-hospital all-cause mortality and was associated with an increase in discharges to home.

Heikkila et al.⁶ conducted a retrospective study highlighting the importance of an emergency physician's role in bringing down the DTN and onset-to-treatment time without increasing the rate of intracerebral hemorrhage. They brought down the DTN time to 20 minutes in their study.

In this issue, we discuss an article by Dr Ankur et al. This single-center “before-and-after” study was carried out on the Indian population. They divided their sample into two groups of 74 patients each—(1) preintervention group, comprising patients who underwent thrombolysis prior to the implementation of the author's rapid thrombolysis protocol and (2) postintervention group, which comprised patients, who were thrombolized as per the rapid thrombolysis protocol developed by the authors.

In the preintervention group, the DTN time is 54.5 minutes and onset-to-needle time is 150.4 minutes. In the postintervention group, the DTN time is 30 minutes and onset-to-needle time is 123.11 minutes.

The authors have shown to achieve a better neurological outcome and favorable outcome at discharge, as measured by a modified Rankin scale, in postintervention group. This gives credence to the studies conducted earlier, exhorting that the benchmark stroke DTN time should be 30 minutes by the implementation of “rapid stroke protocols,”⁷⁻¹⁰ doing away with a longer DTN time of 45 minutes, as recommended by the latest AHA guidelines.¹¹

Department of Neurocritical Care, Medanta–The Medicity, Gurugram, Haryana, India

Corresponding Author: Harsh Sapra, Department of Neurocritical Care, Medanta–The Medicity, Gurugram, Haryana, India, Phone: +91 9650898677, e-mail: harshsapra@hotmail.com

How to cite this article: Sapra H. “No Time to Die” – Saving the Neurons. *Indian J Crit Care Med* 2022;26(5):539–540.

Source of support: Nil

Conflict of interest: None

Poststroke survivors require substantial hospital and social support which causes economic and family burdens as well. In spite of the guidelines which suggest minimizing DTN time, many times the golden hour is wasted. This can be attributed to the lack of training and awareness among physicians to detect stroke chameleons, and delaying treatment to rule out stroke mimics¹² logistical issues, lesser number of facilities in rural areas.

By continuing education and training of the physicians, involving policymakers to remove the logistical hurdles and establishing stroke centers with facilities to detect and administer thrombolysis within the golden hour of stroke, the targets of negating the damaging effects of stroke to a minimum can be achieved.^{13,14}

Setting up telestroke units where smaller centers can communicate with centers where they have radiological facilities for acquiring a CT and if required to transfer to the nearest center where they have thrombolysis facility can also be given a thought.

ORCID

Harsh Sapra  <https://orcid.org/0000-0002-2500-7124>

REFERENCES

1. Johnson CO, Nguyen M, Roth GA, Nichols E, Alam T, Abate D, et al. Global, regional, and national burden of stroke, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Neurol* 2019;18(5):439–458. DOI: 10.1016/S1474-4422(19)30034-1.
2. Warner JJ, Harrington RA, Sacco RL, Elkind MS. Guidelines for the early management of patients with acute ischemic stroke: 2019 update to the 2018 guidelines for the early management of acute ischemic stroke. *Stroke* 2019;50(12):3331–3332. <https://doi.org/10.1161/STROKEAHA.119.027708>.
3. Arima H, Huang Y, Wang JG, Heeley E, Delcourt C, Parsons M, et al. INTERACT1 Investigators. Earlier blood pressure-lowering and greater attenuation of hematoma growth in acute intracerebral hemorrhage: INTERACT pilot phase. *Stroke* 2012;43(8):2236–2238. DOI: 10.1161/STROKEAHA.112.651422.

4. Hacke W, Donnan G, Fieschi C, Kaste M, von Kummer R, Broderick JP, et al. ATLANTIS Trials Investigators; ECASS Trials Investigators; NINDS rt-PA Study Group Investigators. Association of outcome with early stroke treatment: pooled analysis of ATLANTIS, ECASS, and NINDS rt-PA stroke trials. *Lancet* 2004;363(9411):768–774. DOI: 10.1016/S0140-6736(04)15692-4.
5. Tong X, Wiltz JL, George MG, Odom EC, Coleman King SM, Chang T, et al. Paul Coverdell National Acute Stroke Program team. A decade of improvement in door-to-needle time among acute ischemic stroke patients, 2008 to 2017. *Circ Cardiovasc Qual Outcomes* 2018;11(12):e004981. DOI: 10.1161/CIRCOUTCOMES.118.004981.
6. Heikkilä I, Kuusisto H, Holmberg M, Palomäki A. Fast protocol for treating acute ischemic stroke by emergency physicians. *Ann Emerg Med* 2019;73(2):105–112. DOI: 10.1016/j.annemergmed.2018.07.019.
7. Iglesias Mohedano AM, García Pastor A, Díaz Otero F, Vázquez Alen P, Martín Gómez MA, Simón Campo P, et al. A new protocol reduces median door-to-needle time to the benchmark of 30 minutes in acute stroke treatment. *Neurología* 2021;36(7):487–494. DOI: 10.1016/j.nrleng.2018.03.009.
8. Meretoja A, Weir L, Ugalde M, Yassi N, Yan B, Hand P, et al. Helsinki model cut stroke thrombolysis delays to 25 minutes in Melbourne in only 4 months. *Neurology* 2013;81(12):1071–1076. DOI: 10.1212/WNL.0b013e3182a4a4d2.
9. Kamal N, Benavente O, Boyle K, Buck B, Butcher K, Casaubon LK, et al. Good is not good enough: the benchmark stroke door-to-needle time should be 30 minutes. *Can J Neurol Sci* 2014;41(6):694–696. DOI: 10.1017/cjn.2014.41.
10. Gurav SK, Zirpe KG, Wadia RS, Naniwadekar A, Pote PU, Tungenwar A, et al. Impact of “stroke code”-rapid response team: an attempt to improve intravenous thrombolysis rate and to shorten door-to-needle time in acute ischemic stroke. *Indian J Crit Care Med* 2018;22(4):243–248. DOI: 10.4103/ijccm.IJCCM_504_17.
11. Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, et al. 2018 Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke* 2018;49(3):e46–e110.13. DOI: 10.1161/STR.0000000000000158.
12. Ali-Ahmed F, Federspiel JJ, Liang L, Xu H, Sevilis T, Hernandez AF, et al. Intravenous tissue plasminogen activator in stroke mimics: findings from the get with the guidelines–stroke registry. *Circ Cardiovasc Qual Outcomes* 2019;12(8):e005609. DOI: 10.1161/CIRCOUTCOMES.119.005609.
13. Hasnain MG, Attia JR, Akter S, Rahman T, Hall A, Hubbard IJ, et al. Effectiveness of interventions to improve rates of intravenous thrombolysis using behaviour change wheel functions: a systematic review and meta-analysis. *Implement Sci* 2020;15(1):1–21. DOI: 10.1186/s13012-020-01054-3.
14. Verma A, Sarda S, Jaiswal S, Batra A, Haldar M, Sheikh WR, et al. Rapid Thrombolysis Protocol: Results from a Before-and-after Study. *Indian J Crit Care Med* 2022;26(5):547–552.