

Intravenous Thrombolysis for Acute Ischemic Stroke in Patients with Cervicocephalic Dolichoarteriopathy

Rahsan Gocmen, MD,* Ethem Murat Arsava, MD,† Kader Karli Oguz, MD,* and Mehmet Akif Topcuoglu, MD†

Background and Purpose: Cervicocephalic dolichoarteriopathy is not rare in patients with acute stroke. Results of intravenous (IV) tissue plasminogen activator (tPA) treatment have not been documented in this specific population. *Methods:* One hundred (58 females, age: 69 ± 13 years) consecutive patients treated with IV tPA for acute anterior circulation stroke were analyzed. Smoker's criteria were used to score basilar artery dolichoarteriopathy and combined criteria of Weibel-Fields and Metz for cervical carotid artery dolichoarteriopathy. *Results:* Adjusted rates of effective response to tPA (defined as a decrease of the National Institutes of Health Stroke Scale [NIHSS] score to 1 or 0, or a total decrease ≥ 4 point by the end of the first 24 hours; in 51%); first-day dramatic response (≥ 8 NIHSS score decrease; seen in 27%); 3-month favorable (modified Rankin score ≤ 2 ; in 46%) and excellent (modified Rankin score ≤ 1 ; in 37%) functional prognosis, and hemorrhagic complications (any hemorrhage in 34%, significant Fiorelli's parenchymal hemorrhage type 2 in 8%) of IV tPA were not modified with presence and categories of the basilar and extracranial carotid artery dolichoarteriopathy. Univariate analysis documented that basilar artery dolichoarteriopathy was significantly more prevalent in patients with effective response to IV tPA (22% versus 6%, odds ratio: 4.22, $P = .041$). However, an exploratory multiple regression analysis disclosed that NIHSS (per 1 point, $\beta = -.256$, $P = .009$) and time to needle (per 15-minutes, $\beta = -2.389$, $P = .019$) were significant determiners of early favorable prognosis, whereas dolichoectasia was not ($\beta = .141$, $P = .159$). *Conclusion:* IV tPA is safe and effective in acute anterior circulation stroke coexistent with intracranial posterior circulation dolichoarteriopathy and cervical carotid artery kinking, tortuosity, or coiling. **Key Words:** Acute stroke—tissue plasminogen activator—arteriopathy—dilatation—matrix metallo-proteinases—disability.

© 2017 National Stroke Association. Published by Elsevier Inc. All rights reserved.

From the *Department of Radiology; and †Department of Neurology and Neurological Intensive Care Unit, Hacettepe University Hospitals, Ankara, Turkey.

Received February 13, 2017; revision received May 23, 2017; accepted June 1, 2017.

Address correspondence to Mehmet Akif Topcuoglu, MD, Neurological Intensive Care Unit, Department of Neurology, Hacettepe University Hospitals, Sıhhiye, 06100 Ankara, Turkey. E-mail: mat@hacettepe.edu.tr, matopcuoglu@yahoo.com.

1052-3057/\$ - see front matter

© 2017 National Stroke Association. Published by Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jstrokecerebrovasdis.2017.06.001>

Introduction

Dolichoectasia, an increase of the length and diameter of an artery, and dolichoarteriopathy, an increase of length but not diameter, are frequently found in the intracranial and extracranial cervicocephalic arteries of patients with acute ischemic stroke.¹ In people with genetic predisposition, redundant remodeling usually accelerated by uncontrolled vascular risk factors results in development of dilatation, elongation, and sometimes tortuosity in arteries.² Pathologic studies document degeneration of tunica media and fragmentation of internal elastic membrane in the absence of excessive

atherosclerotic changes.¹ The pathophysiology is complex and remains underexplored, but dysregulation of cross-talk among matrix metalloproteinase (MMP), vascular smooth muscle cell, and elastic fiber systems is probably involved in development of dolichoarteriopathy.³

Presence of cervicocephalic dolichoectasia or dolichoarteriopathy correlates well with the presence of cerebral small vessel disease rostrally, and abdominal aortic aneurysm caudally in the arterial tree.^{4,6} In addition, some studies, albeit not all, documented abnormal MMP levels in patients with cervicocephalic dolichoectasia.^{6,7} These all can modify the effect of intravenous (IV) tissue plasminogen activator (tPA) treatment both in a beneficial or harmful way in the setting of acute stroke. In this retrospective study, a possible interaction between computerized tomography (CT) angiographically determined cervicocranial dolichoarteriopathy and IV thrombolysis efficacy, and safety was investigated.

Methods

Patients

One hundred (58 female, mean \pm SD age: 69 ± 13 years) consecutive patients treated with IV thrombolysis for their acute anterior circulation stroke were retrospectively analyzed. Clinical and imaging data were extracted from a prospective stroke registry of our center. Of note, all of the registry patients underwent a protocolized stepwise etiologic workup, including transthoracic echocardiography, Holter monitoring, and diffusion-weighted imaging, along with at least 1 modality of cervico-cerebral angiography. Patient enrollment period covered approximately 8 years, from 2008 to 2016. Standard protocols of IV tPA treatment⁸ were followed. The institutional ethics committee approved the study protocol and the registry.

Patients with internal carotid artery (ICA) occlusion, posterior circulation infarcts, those treated with thrombectomy or not studied with CT angiography were excluded.

Stroke severity was assessed by the National Institutes of Health Stroke Scale (NIHSS)⁹ at admission, at 24 hours, and at discharge. Functional outcome was evalu-

ated at the end of the third month by using modified Rankin Scale (mRS).¹⁰

“Effective response” to IV tPA was defined as a decrease of the NIHSS score to 1 or 0, or a degree of decrease by 4 points or more at the end of the first 24 hours. “Dramatically good response” to IV tPA was noted in case of a decrease of 8 or more in the NIHSS score at the end of first day. “Favorable” outcome was defined as an mRS score of 2 or less, and “excellent” outcome as an mRS score of 1 or 0 after 3 months following stroke. Stroke etiology was classified by using the Causative Classification of Stroke algorithm.¹¹

Imaging

CT angiography source and maximum intensity projection reformats were used for analyses. CT angiographies were performed using commercially available multidetector row scanners (SOMATOM Sensation 16, Erlangen, Germany). Details of the technique can be found elsewhere.¹² Briefly, a single bolus injection (100-130 cc of nonionic contrast medium into an antecubital vein at a rate of 3-4 cc/s) with a dynamic contrast bolus detection (for timing of acquisition) and helical scanning technique were used. Parameters were 120 kV, aortic arch to vertex, 100 mAs, slice width 1 mm, and slice collimation .75 mm.

Basilar dolichoectasia was diagnosed and scored according to Smoker et al’s criteria¹³ adapted to CT angiography. This set of criteria includes basilar artery diameter at the level of mid-pons, basilar trunk laterality, and height of the basilar rostral bifurcation (Table 1). For basilar artery with normal diameter but abnormal laterality and height, dolichoarteriopathy term was preferred.

Cervical carotid artery dolichoarteriopathy was classified as per a combined criteria set of Weibel-Fields and Metz.¹⁴⁻¹⁷ These categories included normal (Category 0), tortuosity (Category 1), mild kinking (Category 2), moderate kinking (Category 3), severe kinking (Category 4), and coiling (Category 5). In addition, Internal carotid artery post-bulb diameter and take-off angle were measured (Table 2).

Table 1. Smoker’s criteria for basilar artery dolichoectasia*

Point	Diameter at mid-pons	Laterality	Height of bifurcation
0	Normal (1.9-4.5 mm)	Midline throughout	At or below dorsum sellae
1	>4.5 mm (ectasia)	Medial-to-lateral margin of clivus (or dorsum sellae)	In the suprasellar cistern
2		Lateral-to-lateral margin of clivus (or dorsum sellae)	At the third ventricle floor
3		At the cerebellopontine angle	Indentation and elevation of the third ventricle floor

*Gray-shaded boxes suggest abnormality.

Download English Version:

<https://daneshyari.com/en/article/5574108>

Download Persian Version:

<https://daneshyari.com/article/5574108>

[Daneshyari.com](https://daneshyari.com)