Good Outcomes in Ischemic Stroke Patients Treated With Intravenous Thrombolysis Despite Regressing Neurological Symptoms

Christian R. Baumann, MD; Ralf W. Baumgartner, MD; Joubin Gandjour, MD; Hans-Christian von Büdingen, MD; Adrian M. Siegel, MD; Dimitrios Georgiadis, MD

Background and Purpose—We evaluated the clinical course of 19 acute stroke patients with rapid early improvement of neurological deficit within the 3-hour window, treated with intravenous thrombolysis.

Results—No patient demonstrated a neurological deterioration during hospitalization. National Institutes of Health Stroke Scale (NIHSS) scores at therapy decision and discharge were 5 (4 to 6) and 0.5 (0 to 1.5), respectively. At 3-month follow-up, 1 patient had died; in remaining patients, NIHSS was 0 (0 to 1) and modified Rankin Scale 0.5 (0 to 1; ≤1 in 15 patients).

Conclusions—Withholding of intravenous thrombolysis because of spontaneous early regression of neurological symptoms may not be justified. (Stroke. 2006;37:1332-1333.)

Key Words: cerebrovascular disorder ■ thrombolysis
years) treated with IVT during the surveillance period. NIHSS at therapy decision was 5 (4 to 6; median [95% CI]; range 1 to 6).

Cranial CT on admission was normal in 10 patients; early signs of ischemic stroke were seen in 6 and dense middle cerebral artery sign in 3 patients. Latency between symptom onset and IVT initiation was $154 \pm 30$ minutes (range 102 to 180 minutes). Etiology of stroke was cardioembolic in 8 (42%), large artery atherosclerosis in 4 (21%), other determined etiology in 2 (11%; internal carotid artery dissection in both cases) and undetermined in 5 (26%) patients. Seven patients were receiving antiplatelet agents before stroke.

No patient demonstrated a neurological deterioration during hospitalization. Lacunar infarcts were diagnosed in 4 patients; in remaining patients, infarct size was $<1/3$ (n=11) or $>1/3$ but $\leq2/3$ of the middle cerebral artery territory (n=4). Asymptomatic hemorrhagic transformation of the ischemic lesion without space-occupying effect was observed in 4 (21%) patients. No parenchymal hemorrhages were diagnosed. NIHSS score at discharge was 0.5 (0 to 1.5; median and 95% CI). Antiplatelet agents were administered in 12, warfarin in 7, and statins in 13 patients.

During 3-month follow-up, 1 patient with intermittent atrial fibrillation and insufficient oral anticoagulation died from recurrent ischemic strokes. In all other patients, symptoms improved or at least remained stable, without signs of recurrent ischemic or hemorrhagic stroke. NIHSS at 3 months in remaining patients was 0 (0 to 1) and mRS 0.5 (0 to 1; median [95% CI]; $\leq1$ in 15 and 2 in 3 patients).

**Discussion**

Existing data concerning the prevalence of REI within the first 3 hours after symptom onset in patients with acute ischemic stroke and the natural history of these patients is limited: O’Connor et al and Cocho et al observed resolution of deficit in $31/214$ (14.5%) and $11/218$ (5%) patients, respectively, but provided no data on their clinical course. Barber et al described resolution of symptoms in $57/314$ (18.2%) patients; only 1 of the 21 patients documented to have had a major motor improvement was discharged from hospital independent, whereas 32% of patients not treated with IVT attributable to mild or significantly improving neurological symptoms were either dependent at discharge or dead during hospital admission. Smith et al reported mild neurological deficit or REI (defined as NIHSS improvement $\geq4$ points) as the most common reason for exclusion from IVT (41 of 71 patients; 58%). The prevalence of REI was 7.8% (10/128 patients). Four of these patients could not be discharged home; 2 died. REI was identified as the only clinical feature associated with subsequent neurological worsening. These results suggest that the issue of REI is relevant, as it concerns a significant (5% to 18%) portion of acute stroke patients eligible for IVT, and is associated with severe subsequent deterioration in approximately one third of patients.

No neurological worsening was observed in any of our 19 patients. The remarkably good outcome observed in this study was probably attributable to the fact that neurological deficit before IVT initiation was quite low (median NIHSS score of 5). Obviously, the present study was not randomized and the patient count is low; additionally, some REI cases were potentially missed because of the rigorous definition applied. Still, comparison of the course of our patients to the natural course described above suggests that IVT should not necessarily be withheld solely because of regressing neurological symptoms. This issue should be addressed in a randomized clinical trial, as it concerns a substantial number of acute stroke patients, who could potentially benefit from thrombolytic treatment.

**References**

Good Outcomes in Ischemic Stroke Patients Treated With Intravenous Thrombolysis Despite Regressing Neurological Symptoms
Christian R. Baumann, Ralf W. Baumgartner, Joubin Gandjour, Hans-Christian von Büdingen, Adrian M. Siegel and Dimitrios Georgiadis

Stroke. 2006;37:1332-1333; originally published online March 23, 2006;
doi: 10.1161/01.STR.0000217272.38455.a2
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2006 American Heart Association, Inc. All rights reserved.
Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/37/5/1332