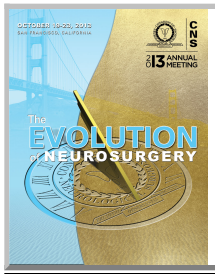

Preprocedural tPA for Acute Cerebral Ischemia Increases Rates of Intracranial Hemorrhage and In-hospital Mortality Following Carotid Artery Stenting: A Study of the Nationwide Inpatient Sample

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Introduction

We studied the impact of preoperative tPA for acute cerebral ischemia on rates of intracranial hemorrhage (ICH) and in-patient mortality following carotid artery stenting (CAS) for acutely symptomatic carotid stenosis.

Methods

From the 2002 through 2009 Nationwide Inpatient Sample Databases, all patients admitted emergently with ICD-9 diagnoses codes consistent with acute cerebral infarction/TIA were extracted. Patients were classified based on ICD-9 codes for CAS, intravenous tPA and ICH.

The impact of pre-operative tPA on rates of ICH and mortality were assessed using Chi-square analysis and multivariate logistical regression. The multivariate model controlled for: age, Charlson Comorbidity Index, coagulopathy, annual hospital CAS volume, annual hospital stroke volume and hospital size.

Results

Of the patients admitted with cerebral infarction/TIA, 20,752 underwent treatment for acutely symptomatic carotid stenosis. CAS was the treatment modality in 2,251 (10.9%). Of the 543 patients who received tPA and underwent carotid revascularization, 63.7% (346) were treated with CAS.

The overall rate of ICH in CAS patients was 7.6% and mortality was 8.6%. In univariate analysis, the rate of ICH was significantly increased in tPA-positive vs. tPA-negative patients, 17.1% vs. 5.9% (OR 3.3, 95% CI 2.3-4.6). Mortality was also increased 17.4% vs. 7.0% (OR 2.8, 95% CI 2.0-3.8).

In multivariate analysis of CAS patients, preprocedural tPA was an independent predictor of ICH (OR 3.0, 95% CI 2.14-4.2). Significant predictors of mortality were tPA (OR 1.9, 95% CI 1.3-2.9), coagulopathy (OR 6.8, 95% CI 4.3-10.7) and ICH (OR 5.4, 95% CI 3.4-8.6). Increased CAS experience – measured by annual hospital CAS volume - decreased mortality (OR 0.90, 95% CI 0.86-0.95).

Conclusions

These results demonstrate that the risks of ICH and in-patient mortality following CAS are significantly increased by preprocedural tPA. These facts should be considered when timing CAS procedures for symptomatic carotid stenosis after acute cerebral ischemia.

Learning Objectives

By the conclusion of this session, participants should be able to:

1) Describe the impact of preprocedural tPA on outcomes following carotid artery stenting

2) Have a greater understanding of the role carotid artery stenting plays in the treatment of carotid artery stenting.

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