
Response:

We thank Plas et al1 for their interest in our article and for sharing their results about the smoking–thrombolysis paradox in ischemic stroke. A meta-analysis is an important further step to clarify the much debated and often conflicting results on this topic. Plas et al1 performed an analysis of 7 studies including 7494 patients receiving thrombolysis, which revealed an odds ratio of 1.38 (95% confidence interval, 1.24–1.53; P = 0.02) for smoking in favor of a good functional outcome (modified Rankin Scale score ≤2) 3 months after stroke. The authors pointed out that the lack of adjustment for age and sex is a limitation of their analysis. This is an essential point, because smokers tend to be significantly younger and more often are men. Age is a strong predictor for outcome and studies have shown gender-specific differences in vascular risk factors and functional recovery.2 Nonetheless, the meta-analysis is reassuring that our observation is not a mere result of chance. An appropriately adjusted meta-analysis is without a doubt still necessary to determine the concrete effects of smoking on ischemic stroke.

Two recent studies have shed light on possible pathophysiological mechanisms underlying this peculiar phenomenon. One suggests smoking to have early protective effects and the other suggests an enhanced treatment efficacy in patients with this risk factor. Lisi et al3 provide evidence suggesting that short-term exposure to reactive oxygen species caused by smoking triggers ischemic preconditioning, reducing endothelial susceptibility to ischemia and reperfusion damage. Nielsen et al4 propose that smoking alters the nature of plasmin–antiplasmin–carbon monoxide interactions in blood plasma, consequently modifying fibrin clot kinetics. Earlier studies have demonstrated that smoking decreases endogenous tissue-type plasminogen activator release, causing an increase in fibrinogen levels and more fibrin-rich thrombi, thereby increasing susceptibility to exogenous tissue-type plasminogen activator treatment.5

Smoking remains a proven risk factor for stroke and has detrimental effects on the cardiovascular system. Whether smoking leads to increased tissue-type plasminogen activator efficacy deserves further studies. Either way, we continue to believe that no stroke is always better than a recanalized stroke.

Disclosures

None.

Anna Kufner, MSc
Christian H. Nolte, MD
Martin Ebinger, MD
Klinik und Hochschulambulanz für Neurologie
Charité—Universitätsmedizin Berlin
Berlin, Germany

Response to Letter Regarding Article, "Smoking-Thrombolysis Paradox: Recanalization and Reperfusion Rates After Intravenous Tissue Plasminogen Activator in Smokers With Ischemic Stroke"

Anna Kufner, Christian H. Nolte and Martin Ebinger

Stroke. published online April 4, 2013;

Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2013 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/early/2013/04/04/STROKEAHA.113.001287.citation

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org//subscriptions/