Unequal Access to Treatment With Intravenous Alteplase for Women With Acute Ischemic Stroke

Inger de Ridder, MD; Maaike Dirks, MD, PhD; Louis Niessen, MD, PhD; Diederik Dippel, MD, PhD; on behalf of the PRACTISE Investigators

Background and Purpose—A recent meta-analysis showed that women with acute ischemic stroke are less likely to receive treatment with intravenous alteplase than men. The aim of this study was to assess sex differences in treatment with intravenous alteplase and to explore the reasons for these differences.

Methods—We analyzed data from the Promoting Acute Thrombolysis for Ischaemic Stroke (PRACTISE) study. We applied a multiple logistic regression model and expressed the association between sex and treatment with an age-adjusted odds ratio with 95% confidence interval.

Results—In total, 5515 patients were included in PRACTISE. Women were an average of 4 years older than men. The median National Institutes of Health Stroke Scale score was 6 in women and 5 in men. Fewer women were treated with intravenous alteplase (11% versus 14%; adjusted odds ratio, 0.8; 95% confidence interval, 0.7–1.0). However, fewer women arrived within 4 hours after onset (27% versus 33%; adjusted odds ratio, 0.8; 95% confidence interval, 0.7–0.9).

Conclusions—Fewer women present themselves within 4 hours from stroke onset than men and consequently less often receive thrombolytic treatment. This difference may be caused by the older age of women on average and consequently women more often living alone.


(Stroke. 2013;44:00-00.)

Key Words: stroke ■ thrombolytic therapy ■ time to treatment
Adjustment for age did not affect this association (adjusted odds ratio, 0.8; 95% CI, 0.7–1.0). In the 1657 ischemic stroke patients presenting within 4 hours of stroke onset, the median NIHSS score was 6 in women and 5 in men (Table 1). Within this subgroup, 41.6% women versus 42.4% men were treated with intravenous alteplase (odds ratio, 1.0; 95% CI, 0.8–1.2; Table 2).

Fewer women presented at the emergency department within 4 hours (27% versus 33%; odds ratio, 0.8; 95% CI, 0.7–0.9). After adjustment for age, the onset-to-door time in women was an average of 27 minutes longer (95% CI, 9–47 minutes). We found no differences in sex distribution in occurrence of hemorrhagic stroke, patients who called a GP or were visited by the GP, or had contraindications for treatment with alteplase (Table 2).

Discussion

Our study showed that women are treated just as often with thrombotic agents as men in the Netherlands, once they arrived in time for treatment. However, if we consider the complete stroke care pathway, fewer women presented at the emergency department within 4 hours of stroke onset. So far, this lower treatment rate in women has not yet been clarified. Our results suggest that this difference could be caused by delayed presentation to the emergency department. This is also confirmed in other studies. Also, in myocardial infarction, there is an underutilization of thrombotic therapy in women and a delay in care seeking. Possible reasons for this delay are differences in presenting symptoms and the older age of women on average. Older people more often live alone and experience an unwitnessed stroke. Living alone makes care seeking difficult and also delays the referral and diagnostic process.

This study has some limitations. Limited demographic details of the included patients were available; therefore, no assumptions on the influence of specific symptoms on onset-to-door time could be made. Also, the data were collected from 2003 to 2005 and therefore can be a little outdated. The strength of the present study is that all patients in the participating centers and the intervention of the GPs were registered and therefore provide a good representation of the whole population. The participating hospitals were representative in size, geographic distribution, and frequency of procedures.

Finally, the impact of sex differences in treatment of acute stroke is huge: ≈25% more women should be treated with alteplase to abolish the difference, and this number is increasing with the aging population. Therefore, further research is needed to understand the reasons why fewer women with acute stroke are admitted in time for treatment to be able to deal with this inequality.

Sources of Funding

The PRACTISE was funded by the Netherlands Organization for Health Research and Development (ZON-MW, grant number 945-14-217).
Disclosures
None.

References
Unequal Access to Treatment With Intravenous Alteplase for Women With Acute Ischemic Stroke

Inger de Ridder, Maaike Dirks, Louis Niessen and Diederik Dippel

Stroke. published online July 25, 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/2013/07/25/STROKEAHA.113.002263