



The NEW ENGLAND JOURNAL of MEDICINE

[HOME](#) | [SEARCH](#) | [CURRENT ISSUE](#) | [PAST ISSUES](#) | [COLLECTIONS](#) | [HELP](#)

Please [sign in](#) for full text and personal services

ORIGINAL ARTICLE

[◀ Previous](#)

Volume 354:353-365

[January 26, 2006](#)

Number 4

[Next ▶](#)

The Risk Associated with Aprotinin in Cardiac Surgery

Dennis T. Mangano, Ph.D., M.D., Iulia C. Tudor, Ph.D., Cynthia Dietzel, M.D., for the Multicenter Study of Perioperative Ischemia Research Group and the Ischemia Research and Education Foundation

ABSTRACT

Background The majority of patients undergoing surgical treatment for ST-elevation myocardial infarction receive antifibrinolytic therapy to limit blood loss. This approach appears counterintuitive to the accepted medical treatment of the same condition — namely, fibrinolysis to limit thrombosis. Despite this concern, no independent, large-scale safety assessment has been undertaken.

Methods In this observational study involving 4374 patients undergoing revascularization, we prospectively assessed three agents (aprotinin [1295 patients], aminocaproic acid [883], and tranexamic acid [822]) as compared with no agent (1374 patients) with regard to serious outcomes by propensity and multivariable methods. (Although aprotinin is a serine protease inhibitor, here we use the term antifibrinolytic therapy to include all three agents.)

Results In propensity-adjusted, multivariable logistic regression (C-index, 0.72), use of aprotinin was associated with a doubling in the risk of renal failure requiring dialysis among patients undergoing complex coronary-artery surgery (odds ratio, 2.59; 95 percent confidence interval, 1.36 to 4.95) or primary surgery (odds ratio, 2.34; 95 percent confidence interval, 1.27 to 4.31). Similarly, use of aprotinin in the latter group was associated with a 55 percent increase in the risk of myocardial infarction or heart failure ($P < 0.001$) and a 181 percent increase in the risk of stroke or encephalopathy ($P = 0.001$). Neither aminocaproic acid nor tranexamic acid was associated with an increased risk of renal,

THIS ARTICLE

- ▶ Full Text
- ▶ PDF
- ▶ PDA Full Text
- ▶ PowerPoint Slide Set
- ▶ Translated Abstracts

COMMENTARY

- ▶ Perspective
by Hunter, D.
- ▶ Editorial
by Vlahakes, G. J.

TOOLS & SERVICES

- ▶ Add to Personal Archive
- ▶ Add to Citation Manager
- ▶ Notify a Friend
- ▶ E-mail When Cited
- ▶ E-mail When Letters Appear

MORE INFORMATION

- ▶ Find Similar Articles
- ▶ PubMed Citation

cardiac, or cerebral events. Adjustment according to propensity score for the use of any one of the three agents as compared with no agent yielded nearly identical findings. All the agents reduced blood loss.

Conclusions The association between aprotinin and serious end-organ damage indicates that continued use is not prudent. In contrast, the less expensive generic medications aminocaproic acid and tranexamic acid are safe alternatives.

Source Information

From the Ischemia Research and Education Foundation, San Bruno, Calif.

Address reprint requests to Dr. Mangano at the Editorial Office, Ischemia Research and Education Foundation, 1111 Bayhill Dr., Ste. 480, San Bruno, CA 94066, or at dtb@iref.org.

[Full Text of this Article](#)

This article has been cited by other articles:

- Vlahakes, G. J. (2006). The Value of Phase 4 Clinical Testing. *NEJM* 354: 413-415 [[Full Text](#)]

[HOME](#) | [SEARCH](#) | [CURRENT ISSUE](#) | [PAST ISSUES](#) | [COLLECTIONS](#) | [HELP](#)

Comments and questions? Please [contact us](#).

The New England Journal of Medicine is owned, published, and [copyrighted](#) © 2006 [Massachusetts Medical Society](#). All rights reserved.