Circulation

ORIGINAL RESEARCH ARTICLE

Magnitude of Soluble ST2 as a Novel Biomarker for Acute Aortic Dissection

Yuan Wang, Xin Tan, Hai Gao, Hui Yuan, Rong Hu, Lixin Jia, Junming Zhu, Lizhong Sun, Hongjia Zhang, Lianjun Huang, Dong Zhao, Pei Gao, Jie Du

DOI https://doi.org/10.1161/CIRCULATIONAHA.117.030469
Circulation. 2018;137:259-269
Originally published November 16, 2017

Jump to

Abstract

Background: Misdiagnosis of acute aortic dissection (AAD) can lead to significant morbidity and death. Soluble ST2 (sST2) is a cardiovascular injury–related biomarker. The extent to which sST2 is elevated in AAD and whether sST2 can discriminate AAD from other causes of sudden-onset severe chest pain are unknown.

Methods: We measured plasma concentrations of sST2 (R&D Systems assay) in 1360 patients, including 1027 participants in the retrospective discovery set and 333 patients with initial suspicion of AAD enrolled in the prospective validation cohort. Measures of discrimination for differentiating AAD from other causes of chest pain were calculated.

Results: In the acute phase, sST2 levels were higher in patients with AAD than those with either acute myocardial infarction in the first case-control discovery set within 24 hours of symptom onset or with patients with pulmonary embolism in the second discovery set (medians of 129.2 ng/mL versus 14.7 with $P<0.001$ for AAD versus acute myocardial infarction and 88.6 versus 9.3 with $P<0.001$ for AAD versus pulmonary embolism). In the prospective validation set, sST2 was most elevated in patients with AAD (median [25th, 75th percentile]: 76.4 [49.6, 130.3]) and modestly elevated in acute myocardial infarction (25.0 [15.5, 37.2]), pulmonary embolism (14.9 [10.2, 30.1]), and angina patients (21.5 [13.1, 27.6], all $P<0.001$ versus AAD). The area under receiver operating characteristic curve for patients with AAD versus all control patients within 24 hours of presenting at the emergency department was 0.97 (0.95, 0.98) for sST2, 0.91 (0.88, 0.94) for D-dimer, and 0.50 (0.44, 0.56) for cardiac troponin I, respectively. At a cutoff level of 34.6 ng/mL, sST2 had a sensitivity of 99.1%, specificity of 84.9%, positive predictive value of 68.7%, negative predictive value of 99.7%, positive likelihood ratio of 6.6, and negative likelihood ratio of 0.01.

Conclusions: Among patients with suspected aortic dissection in the emergency department, sST2 showed superior overall diagnostic performance to D-dimer or cardiac troponin I. Additional study is needed to determine whether sST2 might be a useful rule-out marker for AAD in the emergency room.

acute myocardial infarction **aortic dissection** **diagnosis** **pulmonary embolism** **soluble ST2**

Received May 10, 2017.

Accepted October 30, 2017.

View Full Text

American Heart Association Professional?

Log in with your **Professional Heart Daily username and password**. Not an American Heart Association Professional? Continue below.

Log in using your username and password

Username *

Enter your Circulation username.

Password *

Enter the password that accompanies your username.

LOG IN

Forgot your user name or password?

Pay Per Article - You may access this article (from the computer you are currently using) for 1 day for US$35.00

Regain Access - You can regain access to a recent Pay per Article purchase if your access period has not yet expired.

This Issue

Circulation
January 16, 2018, Volume 137, Issue 3

Table of Contents

Previous **Next**

Article Tools

Share this Article

Related Articles

Biomarker-Assisted Diagnosis of Acute Aortic Dissection

Cited By...

Biomarker-Assisted Diagnosis of Acute Aortic Dissection

CrossRef

Subjects

Basic, Translational, and Clinical Research

- **Clinical Studies**
- **Biomarkers**

Vascular Disease

- **Aortic Dissection**

Circulation

About Circulation

Instructions for Authors

Circulation CME

Statements and Guidelines

Meeting Abstracts

Permissions

Journal Policies

Email Alerts

Open Access Information

AHA Journals RSS

AHA Newsroom

Editorial Office Address:
200 Fifth Avenue, Suite 1020
Waltham, MA 02451
email: circ@circulationjournal.org

Information for:

Advertisers

Subscribers

Subscriber Help

Institutions / Librarians

Institutional Subscriptions FAQ

International Users

National Center
7272 Greenville Ave.
Dallas, TX 75231

Customer Service
1-800-AHA-USA-1
1-800-242-8721
Local Info
Contact Us

ABOUT US

Our mission is to build healthier lives, free of cardiovascular diseases and stroke. That single purpose drives all we do. The need for our work is beyond question. **Find Out More**

Careers >

SHOP >

Latest Heart and Stroke News >

AHA/ASA Media Newsroom >

OUR SITES

American Heart Association >

American Stroke Association >

For Professionals >

More Sites >

TAKE ACTION

Advocate >

Donate >

Planned Giving >

Volunteer >

ONLINE COMMUNITIES

- AFib Support
- Garden Community
- Patient Support Network
- Professional Online Network

Follow Us: