

available at [www.sciencedirect.com](http://www.sciencedirect.com)  
journal homepage: [www.europeanurology.com](http://www.europeanurology.com)



Platinum Priority Collaborative Review Andrology  
Editorial by Hillary A. Keenan on pp. 979–980 of this issue

# A Systematic Review of the Association Between Erectile Dysfunction and Cardiovascular Disease

Giorgio Gandaglia<sup>a</sup>, Alberto Briganti<sup>a</sup>, Graham Jackson<sup>b</sup>, Robert A. Kloner<sup>c</sup>,  
Francesco Montorsi<sup>a</sup>, Piero Montorsi<sup>d</sup>, Charalambos Vlachopoulos<sup>e,\*</sup>

<sup>a</sup> Urological Research Institute, University Vita-Salute San Raffaele, Department of Urology, San Raffaele Scientific Institute, Milan, Italy; <sup>b</sup> Guys and St. Thomas Hospitals London, London, UK; <sup>c</sup> Good Samaritan Hospital, Los Angeles, Department of Medicine, Keck School of Medicine at the University of Southern California, Los Angeles, CA, USA; <sup>d</sup> Centro Cardiologico Monzino, Institute of Cardiology, University of Milan, Milan, Italy; <sup>e</sup> 1st Department of Cardiology, Athens Medical School, Athens, Greece

## Article info

### Article history:

Accepted August 12, 2013

Published online ahead of  
print on August 23, 2013

### Keywords:

Erectile dysfunction  
Coronary artery disease  
Cardiovascular diseases  
Artery-size hypothesis  
Screening  
Phosphodiesterase type 5  
inhibitors

### What does the review

**add:** This review provides the most up-to-date summary of the association between ED and CVD and may help in identifying candidates for CVD assessment among ED patients.

## Abstract

**Background and objective:** Erectile dysfunction (ED) shares many risk factors with cardiovascular disease (CVD). A correlation between ED and CVD has been hypothesized, with ED proposed as an early marker of symptomatic CVD. The aim of this review was to analyze the relationship between ED and CVD, including pathophysiologic links, and to identify which ED patients would benefit from cardiologic assessment.

**Methods:** A systematic search of the MEDLINE, Embase, and Web of Science databases for studies between January 2005 and May 2013 was performed. The search terms included erectile dysfunction, cardiovascular disease, coronary artery disease, risk factors, pathophysiology, atherosclerosis, low androgen levels, inflammation, screening, and phosphodiesterase type 5 inhibitors.

**Key findings:** A link between ED and CVD might involve the interaction between androgens, chronic inflammation, and CVD risk factors that drive endothelial dysfunction (EDF) and atherosclerosis. Because penile arteries are smaller than coronary arteries, EDF causes a more significant blood-flow reduction in erectile tissues than in coronary circulation. Thus, ED could be an indicator of systemic EDF. As it may precede CVD, ED can be used as an early marker to identify men with CVD. Hence, ED patients at high risk of CVD should undergo cardiologic assessment.

**Conclusions and clinical implications:** ED and CVD should be regarded as different manifestations of the same systemic disorder. ED usually precedes CVD onset, and should be considered an early marker of CVD.

© 2013 The Authors. Published by Elsevier B.V. on behalf of European Association of Urology. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

\* Corresponding author. 1st Department of Cardiology, Athens Medical School, Profiti Elia 24, Athens 14575, Greece.

E-mail address: [cvlachop@otenet.gr](mailto:cvlachop@otenet.gr) (C. Vlachopoulos).

