



University of Southern Denmark

## Extent of coronary artery disease is associated with myocardial infarction and mortality in patients with diabetes mellitus [response to letter]

Olesen, Kevin Kris Warnakula; Gyldenkerne, Christine; Madsen, Morten; Thim, Troels; Jensen, Lisette Okkels; Raungaard, Bent; Sørensen, Henrik Toft; Bøtker, Hans Erik; Maeng, Michael

*Published in:*  
Clinical Epidemiology

*DOI:*  
10.2147/CLEP.S222994

*Publication date:*  
2019

*Document version:*  
Final published version

*Document license:*  
CC BY-NC

### *Citation for pulished version (APA):*

Olesen, K. K. W., Gyldenkerne, C., Madsen, M., Thim, T., Jensen, L. O., Raungaard, B., Sørensen, H. T., Bøtker, H. E., & Maeng, M. (2019). Extent of coronary artery disease is associated with myocardial infarction and mortality in patients with diabetes mellitus [response to letter]. *Clinical Epidemiology*, 11, 721-722. <https://doi.org/10.2147/CLEP.S222994>

Go to publication entry in University of Southern Denmark's Research Portal

### **Terms of use**

This work is brought to you by the University of Southern Denmark.  
Unless otherwise specified it has been shared according to the terms for self-archiving.  
If no other license is stated, these terms apply:

- You may download this work for personal use only.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying this open access version

If you believe that this document breaches copyright please contact us providing details and we will investigate your claim.  
Please direct all enquiries to [puresupport@bib.sdu.dk](mailto:puresupport@bib.sdu.dk)

# Extent of coronary artery disease is associated with myocardial infarction and mortality in patients with diabetes mellitus [Response to Letter]

This article was published in the following Dove Press journal:  
*Clinical Epidemiology*

Kevin Kris Warnakula Olesen<sup>1,2</sup>  
Christine Gyldenkerne<sup>1</sup>  
Morten Madsen<sup>2</sup>  
Troels Thim<sup>1</sup>  
Lisette Okkels Jensen<sup>3</sup>  
Bent Raungaard<sup>4</sup>  
Henrik Toft Sørensen<sup>2</sup>  
Hans Erik Bøtker<sup>1</sup>  
Michael Maeng<sup>1</sup>

<sup>1</sup>Department of Cardiology, Aarhus University Hospital, Aarhus, Denmark; <sup>2</sup>Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark; <sup>3</sup>Department of Cardiology, Odense University Hospital, Odense, Denmark; <sup>4</sup>Department of Cardiology, Aalborg University Hospital, Aalborg, Denmark

## Dear editor

We thank Xu et al for their interest in our study.<sup>1</sup> First, we unfortunately did not have access to LDL measurements which we acknowledge potentially could have provided valuable information. We found that statin treatment increased with the extent of coronary artery disease (CAD) which may lead to underestimation of the actual effect of CAD extent.

Second, our dataset did not include information on HbA1c. The association between hyperglycemia and cardiovascular risk is complex.<sup>2</sup> Furthermore, glycemic levels are not part of cardiovascular risk assessment in patients with diabetes since HbA1c does not sufficiently represent the diabetes-related cardiovascular disease severity.<sup>2</sup>

Third, we agree that the location and number of coronary lesions are important indicators of atherosclerotic disease burden at the individual patient level. However, at a cohort level CAD extent was strongly associated with adverse cardiovascular events in diabetes patients. Furthermore, our study aligns with previous results that demonstrated a clear association between the CAD extent and cardiovascular risk in patients with diabetes after coronary angiography.<sup>3</sup>

Fourth, we did not perform analysis stratified by sex. However, we included sex as a variable in the multivariate regression analyses in the study, thus adjusting for the potential effect of sex. We found that sex was not strongly associated with risk of major adverse cardiovascular events (MACE) in angiography patients. Women only had a slightly lower risk of MACE compared to men (adjusted incidence rate ratio 0.93, 95% CI 0.83–1.04) when accounting for additional confounders including CAD extent.

Fifth, we agree that poly-drug usage may result in lower compliance. However, nothing in our data indicates low drug compliance. Our data rather show that compliance to anti-thrombotic treatment and statins was high in patients with CAD. While we cannot account for actual drug ingestion in a registry setting, drug treatment results were based on prescription dispensations. The patients would have had to actively redeem and pay for their prescriptions at a pharmacy which strongly indicates drug compliance. Furthermore, drug treatment was high in all patients with either 1-, 2-, or 3-vessel obstructive CAD. Any potential lack of drug compliance due to poly-drug use would presumably be similar among these patients and, thus, cannot account for the association between cardiovascular risk and CAD extent.

Correspondence: Kevin Kris Warnakula Olesen  
Department of Cardiology, Aarhus University Hospital, Palle Juul-Jensens Boulevard 99, Aarhus 8200, Denmark  
Tel +45 5 380 6480  
Email kevole@clin.au.dk

## Disclosure

The authors report no conflicts of interest in this communication.

## References

1. Gyldenkerne C, Olesen KKW, Madsen M, et al. Extent of coronary artery disease is associated with myocardial infarction and mortality in patients with diabetes mellitus. *Clin Epidemiol.* 2019;11:419–428. doi:10.2147/CLEP.S200173
2. Authors/Task Force Members, Rydén L, Grant PJ, et al. ESC guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD - summary. *Diab Vasc Dis Res.* 2014;11(3):133–173. doi:10.1177/1479164114525548
3. Maddox TM, Stanislawski MA, Grunwald GK, et al. Nonobstructive coronary artery disease and risk of myocardial infarction. *Jama.* 2014;312(17):1754–1763. doi:10.1001/jama.2014.14681

Dove Medical Press encourages responsible, free and frank academic debate. The content of the Clinical Epidemiology 'letters to the editor' section does not necessarily represent the views of Dove Medical Press, its officers, agents, employees, related entities or the Clinical Epidemiology editors. While all reasonable steps have been taken to confirm the content of each letter, Dove Medical Press accepts no liability in respect of the content of any letter, nor is it responsible for the content and accuracy of any letter to the editor.

### Clinical Epidemiology

Dovepress

### Publish your work in this journal

Clinical Epidemiology is an international, peer-reviewed, open access, online journal focusing on disease and drug epidemiology, identification of risk factors and screening procedures to develop optimal preventative initiatives and programs. Specific topics include: diagnosis, prognosis, treatment, screening, prevention, risk factor modification,

systematic reviews, risk & safety of medical interventions, epidemiology & biostatistical methods, and evaluation of guidelines, translational medicine, health policies & economic evaluations. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use.

Submit your manuscript here: <https://www.dovepress.com/clinical-epidemiology-journal>