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CLINICAL RESEARCH

CORONARY

Mechanisms of Atherothrombosis and Vascular Response to Primary Percutaneous Coronary Intervention in Women Versus Men With Acute Myocardial Infarction

Results of the OCTAVIA Study

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CME Objective for This Article: At the completion of this article, the learner should be able to: 1) describe the theoretical gender differences in the pathophysiology of STEMI as suggested by autopsy studies; 2) define the plaque phenotypes that can be observed by optical coherence tomography; and 3) identify the primary endpoints of the OCTAVIA study.

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Mechanisms of Atherothrombosis and Vascular Response to Primary Percutaneous Coronary Intervention in Women Versus Men With Acute Myocardial Infarction

Results of the OCTAVIA Study

ABSTRACT

OBJECTIVES This study sought to assess in vivo sex differences in the pathophysiology of ST-segment elevation myocardial infarction (STEMI) and vascular response to primary percutaneous coronary intervention (PCI).

BACKGROUND There is no consensus on whether differences in the pathophysiology of STEMI and response to primary PCI between women and men reflect biological factors as opposed to differences in age.

METHODS In this prospective, multicenter study, 140 age-matched men and women with STEMI undergoing primary PCI with everolimus-eluting stent were investigated with intravascular optical coherence tomography, histopathology-immunohistochemistry of thrombus aspirates, and serum biomarkers. Primary endpoints were the percentages of culprit plaque rupture at baseline and everolimus-eluting stent strut coverage at 9-month follow-up as determined by optical coherence tomography.

RESULTS Men and women had similar rates of plaque rupture (50.0% vs. 48.4%; risk ratio [RR]: 1.03; 95% confidence interval [CI]: 0.73 to 1.47; $p = 0.56$). Nonruptured/eroded plaques comprised 25% of all cases ($p = 0.86$ in men vs. women). There were no sex differences in composition of aspirated thrombus and immune and inflammatory serum biomarkers. At 9 months, women had similar strut coverage (90.9% vs. 92.5%; difference in medians: RR: 0.2%; 95% CI: -0.4% to 1.3%; $p = 0.89$) and amount of in-stent neointimal obstruction (10.3% vs. 10.6%; $p = 0.76$) as men did. There were no sex differences in clinical outcome either at 30-day or 1-year follow-up.

CONCLUSIONS In patients presenting with STEMI undergoing primary PCI, no differences in culprit plaque morphology and factors associated with coronary thrombosis were observed between age-matched men and women. Women also showed similar vascular healing response to everolimus-eluting stents as men did. (Optical Coherence Tomography Assessment of Gender Diversity In Primary Angioplasty: The OCTAVIA Trial [OCTAVIA]; NCT01377207) (J Am Coll Cardiol Intv 2014;7:958–68) © 2014 by the American College of Cardiology Foundation.

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