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STEMI in young women: Don't miss spontaneous coronary artery dissection!

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Cardiovascular disease is the leading cause of mortality in women globally.¹ Sex-specific differences exist in presentation, pathophysiology and outcomes in patients with ST-segment myocardial infarction (STEMI). The Atherosclerosis Risk in Communities (ARIC) study showed an increase in acute myocardial infarction hospitalizations among young patients, especially women.² Spontaneous coronary artery dissection (SCAD) should be suspected in a young woman without typical atherosclerotic risk factors presenting with acute myocardial infarction. In the largest series of SCAD patients presenting with STEMI, the prevalence of SCAD in women less than 50 years old was 19%.³

In this issue of *Catherization and Cardiovascular Interventions*, Vautrin et al⁴ examined the differences in women versus men presenting with STEMI under the age of 45 among 489 patients (including 57 women, 11.6% of the total) who presented at two percutaneous coronary intervention (PCI) centers in Northern France. A total of 51 women and 93 men matched 1:2 by age, year of admission, and catherization lab were included in the analysis. Unfortunately, the total number of STEMI patients in the registry including those over age 45 was not reported. Therefore, we do not know the frequency of STEMI under the age of 45 in this series. Although this is a relatively small cohort, there were few differences in baseline characteristics beyond anemia, heart rate, blood pressure and peak creatinine. Women had more atypical symptoms and were less likely to be admitted by mobile emergency care units. Similarly, there were few differences in the processes of care. Less women had radial access (40 vs. 57%) and less women received a glycoprotein IIb/IIIa receptor antagonist (29 vs. 47%). This may well reflect the use of standardized protocols in these regional STEMI systems. It is important to note unique aspects of this series of STEMI patients including the fact that only 43% of women and 48% of men received primary PCI for acute reperfusion therapy and the rest received IV fibrinolysis. Whereas in the US well over 80% of STEMI patients undergo primary PCI. In the US SCAD series 70% of SCAD patients underwent acute revascularization including PCI in 62% with a 91% success rate.³

The most striking finding was that among these young patients presenting with STEMI, the prevalence of SCAD was significantly higher in women compared to men (22 vs. 3%) consistent with other studies. Among women the majority of SCAD cases were Type 2 SCAD and the left anterior descending artery was the most affected vessel consistent with

prior studies. There was also a higher percentage of reinfarction in women (15 vs. 1%) which appeared to be related to SCAD with five of the eight reinfarctions in women occurring in those with SCAD. Among the three women with SCAD who received PCI and had reinfarctions, extension of coronary artery dissection was found on both sides of the stent. In addition, two patients with SCAD not receiving PCI had reinfarction. Unlike prior reports showing higher mortality among women presenting with STEMI, the overall outcomes were remarkably good in these young patients with only 2% in-hospital mortality in both women and men. No women with STEMI secondary to SCAD ($N = 22$) died in hospital. This lower mortality may be because in the current study there were no differences in age, comorbid conditions or time to presentation which may drive much of the sex differences in STEMI mortality.⁵ Similarly, Lobo et al showed favorable in-hospital and three-year outcomes in STEMI patients with a 98% survival in SCAD compared to an 84% survival for age/sex matched patients with atherosclerosis.³ This low mortality was striking in light of the high-risk features in the SCAD patients (19% cardiogenic shock, 13% left main and 16% out of hospital cardiac arrest).³

In conclusion, this study highlights sex differences in STEMI in young patients under 45 years of age. Among young women presenting with STEMI, 22% had SCAD. They also report in-hospital reinfarction rates as high as 15% in women less than 45 years old with STEMI compared to only 1% in men. Unlike prior studies, in-hospital mortality in this cohort of young patients with STEMI was low in both women and men. Take home point for Interventional Cardiologists: when a young woman presents with STEMI, do not miss SCAD!

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Key Points

- Sex difference in STEMI in young patients under 45 years old: 22% of women had spontaneous coronary artery dissection (SCAD) compared to only 3% of men.
- Young women were more likely to have reinfarction compared to men (15 vs. 1%).
- In contrast to previous reports, in-hospital mortality was low in both young women and men with STEMI (2%).