

SCAD (NP-SCAD) (1,2). The mean age of women with P-SCAD (33 to 34 years) was much younger than that of SCAD cohorts in contemporary series, where P-SCAD represented <5% of cases (2.4% in our 327-patient cohort) (3). The anatomic geography of P-SCAD had a predilection for left main coronary artery (24% to 36%), proximal artery (62%), and multivessel (33% to 35%) dissections, at rates that were much higher than in NP-SCAD populations, where the rate of left main coronary artery involvement was 1% to 4%, proximal artery dissection was 8% to 19%, and multivessel dissection was 10% to 15% (4). As a result, P-SCAD constitutes undeniably one of the highest-risk cohorts of SCAD, with more serious clinical acuity, with ~25% of patients developing cardiogenic shock and requiring mechanical support, and with a greater proportion requiring revascularization (69% to 70%, including 26% to 37% requiring coronary artery bypass graft surgery) (1,2). Furthermore, the rate of spontaneous angiographic healing may be lower in patients with P-SCAD; spontaneous angiographic healing was observed in 65% of a small cohort who had surveillance angiography (1), and this rate appeared lower than in contemporary SCAD series (73% to 97%) (5). Therefore, although a conservative approach is the preferred first-line therapy for acute SCAD presentation, in a significant proportion of patients with P-SCAD, this may not be feasible. Management of patients with P-SCAD should be individualized; those patients with high-risk features such as left main coronary artery dissection, hemodynamic instability, or persistent or recurrent ischemic symptoms (5) should be considered for urgent revascularization with a team-based approach that should include interventionalists and cardiovascular surgeons, given the common occurrence of percutaneous coronary intervention failure and the need for a bail-out or first-line approach with coronary artery bypass graft surgery.

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REPLY: Sex, Gender, and Reproductive History Are Critical Variables for Spontaneous Coronary Artery Dissection Research



We appreciate the interest and thoughts from several readers regarding our article titled, “Spontaneous Coronary Artery Dissection Associated With Pregnancy.” Drs. Krittanawong and Yue highlight the challenges of International Classification of Diseases-coded research. This observation emphasizes the importance of tailoring databases to include relevant sex-based concerns to further identify and risk stratify women with cardiac disease. We agree with Drs. Elkayam and Havakuk that patients with pregnancy-associated spontaneous coronary artery dissection (P-SCAD) present with more severe disease as compared with patients with non-pregnancy-associated SCAD (NP-SCAD), and such cases can be challenging to manage.

We thank Dr. Macaya and colleagues for their thoughts. Of note, the Table 2 row heading in our paper should have read nulligravida (n = 34 in our cohort) instead of nulliparous (n = 45 in our cohort), so the comparisons performed by Dr. Macaya and colleagues do indeed include only women with prior pregnancy. The repeated exposure to the stress of pregnancy may heighten risk in vulnerable patients, and, as alluded to, this likely encompasses both the P-SCAD and NP-SCAD subgroups. Even though some aspects of the reproductive history are similar between the P-SCAD and NP-SCAD groups, the differences in severity of SCAD presentation remain significant. Of note, some of the nulligravida women were of childbearing age (mean age 45 years; range 20 to 63 years), and the women with NP-SCAD had varying exposure to exogenous hormones. Four of the nulligravida women with NP-SCAD had history of infertility treatments without subsequent pregnancy. Undoubtedly, these observations highlight the complexities of scientifically studying and understanding

the role of reproductive history and ovarian hormones with regard to SCAD.

The suggestion that patients with P-SCAD may be too young to have fibromuscular dysplasia (FMD) is thought provoking. Current data suggest that FMD is for the most part a stable disease entity (1), and among patients with SCAD, imaging evaluation for FMD is recommended for all patients regardless of age or symptoms (2). However, much remains to be learned about the natural history of SCAD, FMD, and the extent of their overlapping mechanisms.

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Should We Recommend Cardiac Rehabilitation in Patients With Spontaneous Coronary Artery Dissection?



Saw et al. (1) have reported a high frequency of recurrent events following spontaneous coronary artery dissection (SCAD), including recurrent SCAD. As in prior experiences, SCAD occurred predominantly in women, and many of these women were pre-menopausal. To date, however, optimal means for preventing recurrent events in patients with SCAD remains unclear. Thus, it is notable that Saw et al. (1) also found that hypertension independently

predicted recurrent SCAD and that β -blocker treatment reduced the incidence of recurrent SCAD in a multivariate model (1). β -Blockers are presumably beneficial in reducing coronary arterial wall stress in patients with SCAD.

In addition, participation in cardiac rehabilitation (CR) represents another potential means that should be strongly explored to reduce risk in patients with SCAD. CR is associated with a reduction in blood pressure, improvement in sympathovagal balance, and decreased risk of recurrent atherosclerotic myocardial infarction (MI) (2). Several studies, as well as animal models, have also suggested that exercise training during CR may augment the effects of β -blockers in both MI patients and healthy volunteers (2-4). Moreover, Malfatto et al. (2) have shown that post-MI patients who used β -blockers and who underwent CR had a better autonomic profile both in the short term and the long term compared with patients who underwent CR without β -blockers. Thus, a combination therapy of β -blockers and CR could potentially regulate sympathetic activation in a more efficient manner than can β -blockers alone.

Saw et al. (1) also noted that precipitating emotional and physical stressors were common among their SCAD cohort. To this end, we have recently reported that CR can also improve the physical, psychological, and emotional status of patients with SCAD (5).

Interestingly, according to the Mayo Clinic registry, several health care providers hesitate to recommend CR because of limited data (5). However, CR has been shown to be safe in patients with SCAD and may attenuate the risk of recurrent SCAD through several potential mechanisms. Thus, until clinical trials can produce meaningful data, CR should be routinely considered in combination with β -blockers in patients with SCAD to prevent recurrent SCAD.

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