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Seeing is believing? Angina and myocardial ischemia with clean coronaries

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Introduction: Patients with angina, signs of ischemia, and normal coronary arteries are often referred to having cardiac syndrome X (CSX), a type of microvascular dysfunction. It is recognized to become highly prevalent, especially in women, and associated with an adverse prognosis. In addition, the diagnosis and management is often challenging. We present a woman with a presumed case of cardiac syndrome X.

Case: A 52-year-old African-American female with a past history of hypertension, hyperlipidemia, and impaired glucose tolerance presented with an episode of exertional chest pain. It was described as a substernal heaviness radiating to the left arm with no other associated symptoms relieved by sublingual nitroglycerin. The patient had similar symptoms 4 years ago with an abnormal stress test and follow up a coronary angiography revealing non-obstructive vessels. The patient had a blood pressure of 224/112, heart rate of 70 bpm, respiratory rate of 18, 98% oxygen saturation on room-air, and was afebrile. Physical exam was otherwise unremarkable. Initial ECG showed lateral lead T-wave flattening. Initial troponin-I was 0.74 ng/mL. She was started on therapeutic anticoagulation, antiplatelet agents, statin, and a beta-blocker. An ECG 6 hours later showed symmetric T-wave inversions in the lateral leads, and an elevated troponin-I at 6.72 ng/mL. She had a transthoracic echocardiogram showing normal systolic and diastolic function with no wall motion abnormalities, and a left ventricular ejection fraction of 58%. Subsequently, the patient underwent a non-emergent coronary angiography revealing non-obstructive vessels. She continued to remain asymptomatic with a peak Troponin-I of 6.72 ng/mL that subsequently continued to trend down. Therefore, the patient was deemed stable and discharged home. Two days later, the patient returned with similar chest pain that was again relieved by nitroglycerin in the ER. Initial ECG showed biphasic T-waves in the lateral leads, and the troponin-I was 1.91 ng/mL, which trended upward during the hospital course, peaking at 18.48 ng/mL. Another transthoracic echocardiogram was done revealing normal systolic and diastolic function with no wall motion abnormalities, and a left ventricular ejection fraction of 60%. The patient remained asymptomatic after addition of a calcium-channel blocker and a long-acting nitrate. On follow up, the patient continues to remain asymptomatic on her new anti-anginal regimen for the last 6 months.

Discussion: CSX is a type of coronary microvascular dysfunction without associated myocardial disease that is broadly defined as persistent angina, evidence of ischemia, and non-obstructive epicardial coronary arteries on angiography. The patient in our case met all of these criteria. No further abnormal coronary microvascular response to functional testing for reproducibility of symptoms was done to prevent extra health care cost as the end medical management would not change. The estimated lifetime cost of health care for a woman with chest pain and non-obstructive coronary vessels is approximately 1 million dollars. Recent studies have shown adverse prognosis with significant morbidity and an increase in risk for cardiovascular events in patients with CSX. Therefore, aggressive life-style modification with diet and exercise is recommended with symptomatic relief provided by nitrates, calcium-channel blockers, beta-blockers, ACE-inhibitors, and statins. The important take home points include recognition of the existence of coronary microvascular dysfunction in patients with persistent angina and normal coronary arteries, and the use of anti-anginal medications with strict coronary artery disease risk factor modification.

Biography

Ramsy Abdelghani graduated from Jordan University of Science and Technology and is currently an Internal Medicine PGY-2 resident at Baton Rouge General, an affiliate of Tulane University School of Medicine. He has future goals to pursue a Critical Care and Pulmonary fellowship.

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