Clinical presentation and cardiovascular risk factors in patients with STEMI due to spontaneous coronary artery dissection (SCAD)

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Background: Spontaneous coronary artery dissection (SCAD) may occur in the absence of atherosclerotic and traumatic etiology and can lead to severe clinical manifestations such as ST-segment elevation myocardial infarction (STEMI). Compared to atherosclerotic STEMI, younger patients and females are predominantly affected. Hence, underdiagnosis is an important concern. We therefore systematically analyzed the prevalence of SCAD among a large cohort of young patients presenting with STEMI, as well as risk factors and presenting symptoms.

Methods: We retrospectively identified a consecutive cohort of 631 patients younger than 55 years who underwent coronary angiography due to STEMI between 01/2005 and 10/2022. Systematic review of coronary angiograms allowed identification of all STEMI caused by SCAD (n=20, 3.2%), including patients previously misdiagnosed as atherosclerotic STEMI. By reviewing medical records, we identified symptoms at presentation and cardiovascular risk factors in patients with SCAD-STEMI.

Results: Out of the 20 patients <55 years presenting with SCAD-STEMI, 16 (80%) were female, and the mean age was 49.5 years. By far the most common presentation was typical angina (75%, n=15), being reported by all 4 male and 11/16 female patients (100% vs. 69%, respectively). Importantly, three patients presented with cardiac arrest due to malignant ventricular arrhythmia (15%). In 6 patients, symptoms were mild and atypical (nausea/vomiting, n=3, 15%; atypical chest pain, n=2, 10%; and diaphoresis, n=1, 5%). There was no significant difference of symptoms between men and women.

11 patients (55%) were treated by primary PCI, none received emergency coronary artery bypass grafting (CABG). The mean maximum serum creatin kinase (CK) level was 1410 U/l (range 139-86144 U/l). Mean left ventricular ejection fraction (LVEF) was 50% (range 30-60%). Symptoms at presentation did not correlate with maximum CK levels, nor with LVEF.

In this caucasian cohort, the most common cardiovascular risk factor was arterial hypertension (n=12, 60%), followed by smoking (n=9, 45%). Six patients had hyperlipidemia (30%), and three (15%) were obese. Diabetes and a positive family history for cardiovascular events were rare (n=2, 10% vs. n=1, 5%, respectively).

Conclusion: In this large caucasian cohort of young patients with STEMI, SCAD accounted for 3.2% of cases. Typical angina was the most common symptom at presentation, but cardiac arrest due to ventricular fibrillation was frequent. Symptoms in men and women were similar and did not correlate with LVEF, nor with maximum CK levels.