

11438**High prevalence of complex coronary artery lesions in sport-related myocardial infarction. Contemporary data from the RICO survey**

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Background: Underlying mechanisms for sport-related acute myocardial infarction (SR-AMI) are only poorly understood. Moreover, their coronary artery disease (CAD) characteristics and lesion complexity are poorly described.

Purpose: To characterize coronary angiographic feature of patients with SR-AMI

Methods: From the RICO database, a large regional acute MI survey, all consecutive patients hospitalized in our University Hospital from 2010 to 2021 who underwent coronary angiography for SR-MI were retrospectively analysed. SR-MI was defined as MI occurring during sport activity or within the first hour of recovery.

Results: Among the 174 patients included, most were male (n=157(91%)). Median (IQR) age was 59 y (48-66), and had ST segment elevation MI (STEMI) (n= 112 (64%)). The SR-MI often occurred while cycling (41%), jogging (23%), hiking (9%) or playing soccer (9%). Patients commonly experienced pre-hospital (PH) sudden cardiac arrest (SCA) (17%). Atherothrombotic risk factors were dyslipidaemia (32%), current smoking (31%) or hypertension (28%). A history of CAD was documented in 31 (18%) patients. Most (n=156(91%)) had significant lesions, of whom 140 (81%) were considered as culprit. Culprit lesions were located on left anterior descending (39%), circumflex (14%) and right coronary artery (33%). Median (IQR) Syntax score was 10.5 (6-15). The vast majority of patients (n=152 (87%)) had at least one complex lesion; 114 of them had several characteristics of complex lesion. Lesions were eccentric in 68 (39%) patients; an intraluminal thrombus was documented in 85 patients (49%), in 55% of STEMI and 37% of non-STEMI (p=0.027). However, 18 subjects (10%) had optically normal coronary angiogram or non-significant lesions, suggesting alternative mechanism such as type 2 MI. Treatment of the lesions was mainly achieved by PCI and/or stenting (n=132(77%)) or coronary artery bypass grafting (n=11(6%)). In-hospital death occurred in 11 patients (6%), of whom 10 experienced a PH-SCA and one was admitted with a cardiogenic shock during the Covid-19 pandemics lockdown. Among the 5 patients treated with extracorporeal membrane oxygenator, only one survived.

Conclusion: In our large retrospective study, SR-MI was commonly associated with complex coronary lesions, often characterized by intraluminal thrombus. Our findings suggest that the mechanisms of these events could be mainly related to type 1 MI patterns. Moreover, PH-SCA was frequent, thus justifying mass-education to basic life support and deployment of automated external defibrillators, especially in the sport settings.