Prevalence of standard modifiable cardiovascular risk factors in patients with ST segment elevation myocardial infarction and its relation with outcomes

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Background: It has been recently suggested that more than 15% of patients with ST-segment–elevation myocardial infarction (STEMI) lack any of the standard modifiable risk factors (cigarette smoking, diabetes, hyperlipidemia, and hypertension -SMuRFs). This claim implies that other factors play a significant role in development of STEMI and has led to considerable interest in genetic causes of coronary heart disease including family history (FHx)

Purpose: To investigate whether FHx may be a significant driver for STEMI in patients without SMuRFs.

Methods: We analyzed 11,840 patients with ACSs, without evidence of prior cardiovascular disease (CVD) enrolled in the ISACS-TC (International Survey of Acute Coronary Syndromes in Transitional Countries) registry between January 2010 to January 2021. Main outcome measures were the adjusted rates of STEMI and 30-day mortality from STEMI using multivariable logistic regression models. Patients presenting with non-ST elevation acute coronary syndromes served as controls.

Results: Among patients with STEMI, at least 1 of the 4 conventional risk factors was present in 88.1% of women and 86.7% of men. Overall, 3,194 patients (27.0%) self-reported a FHx of CV disease, defined as a first-degree relative with premature CV events (men, age $<$55 years; women, age $<$65 years). There were 261 (8.2%) patients with FHx but without SMuRFs and 2,933 (91.8%) patients with FHx and SMuRFs. After adjusting for age, and standard risk factors, FHx was associated with a significantly lower incidence of STEMI in patients with SMuRFs, but not in those without SMuRFs (ORs: 0.87; 95% CI: 0.79 to 0.97 vs 0.80; 95% CI: 0.58 to 1.12). Prior use of evidence-based medications (aspirin, beta-blockers, ACE inhibitors/ARBs and statins) did not consistently change prior estimates on FHx and SMuRFs (OR: 0.82 95% CI: 0.71 to 0.96 and OR 0.89 95% CI: 0.54–1.47). Patients who presented with STEMI had a 46% excess risk of 30-day mortality (OR: 1.46; 95% CI: 1.11 to 1.91; $p<0.001$) compared with controls

Conclusions: In direct contrast with recent findings, almost 90% of patients with STEMI have SMuRFs. Self-reported FHx is not a significant risk factor for development of STEMI and related high rate of CV mortality in patients without SMuRFs. Although research on genetic causes of heart disease is important, public health policies, and research efforts should place significant emphasis on the 4 SMuRFs and the lifestyle behaviors causing them to reduce the epidemic of STEMI.