Impact of type 2 diabetes mellitus and blood glucose admission levels in patients with myocardial infarction with non obstructive coronary artery disease (MINOCA)

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Background: Myocardial infarction with non-obstructive coronary arteries (MINOCA) is a heterogeneous clinically entity and represents 5% to 10% of all patients with myocardial infarction (MI). Besides type 2 diabetes mellitus (DM), which is a common comorbidity in patients hospitalized for an acute coronary syndrome, high glucose levels (HGL) at admission are frequently observed in this context. The risk of major adverse cardiovascular events following acute coronary syndrome is increased in people with DM and HGL. However, evidence regarding diabetes and high glucose level among MINOCA patients is lacking.

Purpose: To examine the incidence of major adverse cardiovascular events (MACEs) in diabetic and non-diabetic MINOCA patients as well as according to HGL at presentation.

Methods: Among 1995 patients with acute MI admitted to our coronary care unit from 2016 to 2018, we enrolled 186 consecutive MINOCA patients according to the current ESC diagnostic criteria. HGL at admission was defined as serum glucose level above 180 mg/dl. All-cause mortality and a composite end-point of all-cause mortality and myocardial re-infarction were compared. The median follow-up time was 19.6±12.9 months.

Results: Diabetic MINOCA patients were older (mean age 75.5±9.6 vs 66.5±14.7; p=0.002) and with higher prevalence of hypertension (p=0.016). Conversely, there were no significant differences in gender, BMI, dyslipidemia and atrial fibrillation. Similarly, no significant differences were observed regarding clinical and ECG presentation, echocardiographic features and laboratory tests. The rates of death (30.8% vs 8.3%; p=0.013) and MACEs (22.2% vs 6.8%; p=0.025) were significantly higher in MINOCA-DM patients; conversely, no significant differences were observed for re-MI (p=0.58). At multivariate regression model adjusted for age and sex, type 2 DM was not an independent predictor of all cause deaths (p=0.36) and MACE (p=0.24).

Patients with admission HGL had similar baseline characteristics, cardiovascular risk factors, clinical presentations, echocardiographic features and troponin values as compared to patients with no-HGL. HGL at admission was associated with higher incidence of all-cause-death ($p<0.001$) and MACE (p=0.003) during follow-up compared to patients with no HGL; conversely, no significant differences were observed in the incidence of re-MI (p=0.7). Multivariate analysis adjusted for age and sex demonstrated that HGL was an independent predictor of death (HR 6.25; CI 1.64–23.85; p=0.007) and MACEs (HR 6.17; CI 1.79–21.23, p=0.004).

Conclusion: In MINOCA patients, HGL was an independent risk factor for both MACEs and death while type 2 DM was not correlated with these hard endpoints. As a consequence, HGL could have a still unexplored pathophysiological role in MINOCA. Properly powered randomized trials are warranted.