Type 2 Myocardial Infarction in Older Adults

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♦ Background

- Type 2 myocardial infarction (MI) results from a supply-demand imbalance in myocardial oxygen without involving the classic plaque rupture (Type 1 MI) in its pathogenesis.
- The oxygen mismatch is usually precipitated by an acute stressor, often occurring in patients with multiple comorbidities and tends to be more common in older adults.
- Given the multiple etiologic factors involved in its pathogenesis, the increased incidence among older adults, and the poorly defined diagnosis and treatment options for Type 2 MI, we hypothesize that Type 2 MI may be classified as a geriatric syndrome.

♦ Objectives

- To differentiate MI types using criteria from the Fourth Universal Definition of MI in patients 75 years or older admitted for acute MI.
- Characterize patients by MI type in terms of shared risk factors for geriatric syndromes.

♦ Hypothesis

- Type 2 MI patients will have a greater burden of shared risk factors for geriatric syndromes compared with patients with Type 1 MI.

♦ Methods

- We utilized data from the Comprehensive Evaluation of Risk Factors in Older Patients with Acute MI (SILVER-AMI) study to identify older adults with Type 2 MI.
- The SILVER-AMI study did not include the Fourth Universal Definition of MI.

♦ Methods

- A retrospective chart review was performed to differentiate MI types 1 and 2 using the Fourth Universal Definition of MI.
- Cases were characterized as Type 1 MI based on evidence of acute coronary thrombus using records of invasive diagnostic and interventional procedures.
- Patients without evidence of atherothrombosis were classified as Type 2 after an in-depth chart review.
- Data on shared risk factors for geriatric syndromes, such as Activities of Daily Living (ADLs) or mobility, were collected in the SILVER-AMI study via performance-based assessments or self-report at baseline and 6-month follow up.

♦ Statistical analysis

- Mean, percentage, and standard deviation (SD) were used to summarize data.
- T-test and Chi-Square tests were used for comparison.
- Observations with missing data were excluded from analyses.

♦ Results

- A total of 708 charts were reviewed for this preliminary analysis. 55% were male with a mean age of 81 (SD 4.1). 477 (67%) patients were classified as Type 1 MI, 172 (24%) as Type 2 MI, and the rest as no MI or indeterminate.
- 620 (90.2%) patients had stable coronary artery disease (CAD) with the majority (72.6%) classified as having severe CAD (>/= 70% stenosis).
- Fixed coronary atherosclerosis (101 patients, 58%) was the most common proposed mechanism for Type 2 MI.

♦ Results

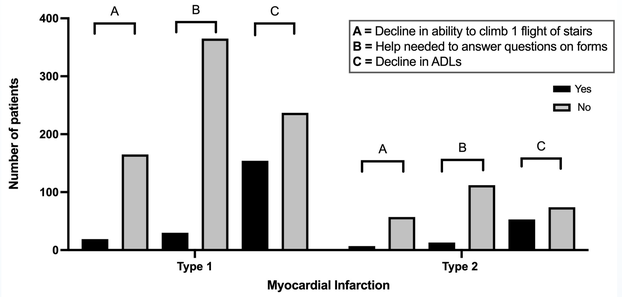
Table 1. Baseline characteristics.

n = 649	Type 1 MI (477)	Type 2 MI (172)	p-value
Age (years, mean)	80.5	80.4	0.88
Gender (male, %)	58%	51%	0.09
Proposed mechanism for Type 2 MI (n)			
a.- Fixed coronary atherosclerosis		99	
b.- Sustained tachyarrhythmia		26	
c.- Hypotension and/or shock		19	
d.- Respiratory failure		15	
e.- Severe aortic stenosis		11	
f.- Severe hypertension		10	
g.- Other		49	
Number of deaths (%)	8%	20%	<0.0001

A **geriatric syndrome** is defined as a multifactorial health condition caused by accumulated effects of impairments in multiple systems that render an older person vulnerable to situational challenges.

♦ Results

Figure 1. Changes in shared risk factors for geriatric syndromes at 6 month-follow up.



There were no statistically significant differences in ADLs, ability to climb one flight of stairs, or help needed to answer questions on forms between both groups at 6-month follow up.

♦ Limitations

- This study included only retrospective analyses.
- Currently there is no standard criteria to define Type 2 myocardial infarction.

♦ Conclusions

- Type 2 MI is a common presentation of acute MI in the geriatric population, furthermore, it is associated with a high mortality rate.
- Even though there were no differences in shared risk factors for geriatric syndromes between Type 1 and Type 2 MI groups, the reported decline in functionality was almost 50% in both groups.
- Further analysis, including the entire sample from the SILVER-AMI study, should be performed for better characterization of Type 2 MI in older adults.