Exercise-induced prolongation of the infarct-related Q-waves as a marker of myocardial viability in the infarcted area


DOI: 10.1016/j.ijcard.2003.04.028

Abstract

Objective: It is known that exercise-induced ischemia in patients with coronary artery disease (CAD) may produce QRS prolongation in the surface electrocardiogram (ECG). To investigate the presence of exercise-induced Q-wave prolongation in patients with single-vessel CAD and Q-wave myocardial infarction (MI), in association with the presence of reversible perfusion defects during thallium scintigraphy in the infarcted area.

Methods: 107 consecutive patients (89 males, mean age 56±8 years) were evaluated. All patients underwent coronary arteriography, maximal treadmill exercise testing and thallium-201 scintigraphy. Q-wave duration was measured both before exercise testing and during maximal heart rate from 12-lead ECGs recorded with a paper speed of 50 mm/s.

Results: Only 57 out of the 107 studied patients showed reversible perfusion defects in the infarcted area during thallium scintigraphy. Q-wave duration was significantly increased from the resting to the stress ECG (ΔQ-wave duration) in patients with reversible perfusion defects in the infarcted areas (10±13 ms), but not in patients with fixed defects in the infarcted zone (−2.0±5 ms, p<0.01). The sensitivities and the specificities of Q-wave prolongation, ST segment elevation, and the combination of ST segment elevation with ST segment depression in the reciprocal leads for the detection of myocardial viability in the infarcted area were 82%, 48%, 29% and 88%, 50%, and 90%, respectively.

Conclusions: Exercise-induced Q-wave prolongation is demonstrated in those patients with single-vessel CAD and a recent MI who show reversible perfusion defects in thallium scintigraphy. Exercise-induced Q-wave prolongation was found to be a sensitive and specific ECG marker for the detection of myocardial viability in the infarcted area.

Keywords: Q-wave prolongation, Myocardial viability, Exercise electrocardiography