EXERCISE TRAINING RELIEVES PALPITATION AND PREMATURE VENTRICULAR DEPOLARIZATIONS THROUGH DECREASE IN PERI-INFARCT ZONE

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Background: Tissue heterogeneity within the infarct periphery, strongly correlates with inducibility of ventricular tachycardia in postinfarction patients. Cardiac rehabilitation reduces the incidence of sudden death. However, the effect of cardiac rehabilitation on tissue heterogeneity in the infarct periphery and exercise-induced ventricular arrhythmia has not been investigated. In the present study, we quantify myocardial infarct heterogeneity by contrast-enhanced magnetic resonance imaging (MRI) and relate it to palpitation and exercise-induced premature ventricular depolarizations (PVDs) in postinfarction patients undergoing cardiac rehabilitation.

Methods: Thirty-nine patients were recruited, and 20 were randomly assigned to undergo a 3-month training program. At enrollment and at 3 months after randomization, all patients underwent exercise testing and cardiac MRI. The peri-infarct zone was quantified based on signal-intensity thresholds (2 to 3 SDs above remote normal myocardium). Patients were prospectively classified as having or not having frequent PVDs (PVDs constituting more than 10 percent of all ventricular depolarizations during any of the 30-second electrocardiographic recordings).

Results: At entry, the palpitation frequency, the extent of peri-infarct zone and the percentage of frequent PVDs were similar in both groups. After 3 months, the extent of peri-infarct zone increased by 26% (P<0.01) in patients without training, but not in trained patients. Palpitation and PVDs decreased after training for 3 months. The extent of peri-infarct zone was strongly associated with inducibility for VPDs during exercise and was a significant factor in a stepwise logistic regression.

Conclusions: Clinical benefits after cardiac rehabilitation in postinfarction patients are associated with the attenuation of peri-infarct zone expansion and exercise-induced premature ventricular depolarizations.