



MYOCARDIAL ISCHEMIA AND INFARCTION

TREATMENT WITH WHOLE BODY PERIODIC ACCELERATION WITH A HORIZONTAL MOTION PLATFORM REVERSES LEFT VENTRICULAR REMODELING IN ANGINA PATIENTS WITH OLD MYOCARDIAL INFARCTION

ACC Poster Contributions

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Purpose: Whole body periodic acceleration (WBPA) with a horizontal motion platform augments intravascular pulsatile shear stress with a release of nitric oxide and improves vascular endothelial function. We hypothesized that treatment with WBPA reverses left ventricular (LV) remodeling as a result of increased coronary and peripheral vasodilatory reserve in angina patients with old myocardial infarction (MI).

Methods: Twenty-six angina patients [68 ± 10 (SD) years] with old MI who were not indicated for PCI and/or CABG were randomly assigned to remain sedentary (Sedentary group: SE group, $n = 13$) or to undergo 20 sessions of WBPA with the motion platform for 4 weeks (WBPA group, $n = 13$). WBPA was applied at 2 to 3 Hz and approximately ± 2.2 m/sec² for 45 min. We repeated the symptom-limited treadmill exercise test using the standard Bruce protocol along with adenosine sestamibi myocardial scintigraphy.

Results: In the WBPA group, the exercise time until 0.1 mV ST depression increased from 4.4 ± 2.1 to 6.4 ± 2.7 min ($p < 0.05$), and the double product at 0.1 mV ST depression from $15,400 \pm 3,500$ to $17,400 \pm 3,500$ mmHg-beats/min ($p < 0.05$). These findings suggest that the treatment ameliorates exercise capacity as a result of both central and peripheral effects. In resting scintigraphic images, LV end-diastolic volume index decreased from 73 ± 38 ml/m² to 60 ± 27 ml/m² ($p < 0.05$), with a significantly augmented LV ejection fraction from 50 ± 16 % to 55 ± 16 % ($p < 0.05$). These findings indicate the reverse of the LV remodeling after MI. The severity score of myocardial scintigraphy during adenosine infusion decreased from 20 ± 10 to 14 ± 8 ($p < 0.05$), resting severity score also decreased from 13 ± 10 to 8 ± 10 ($p < 0.05$), indicating that size of both the ischemic and hibernating myocardium became smaller. In contrast, all aforementioned parameters remained unchanged in 13 sedentary patients receiving only convention medical treatment.

Conclusions: Treatment with WBPA for angina patients ameliorates exercise capacity, myocardial ischemia and LV remodeling through central and peripheral effects. The development of such a therapeutic modality will open a new field of the treatment of angina patients with old MI.