

Interval training after PCI reduces in-stent restenosis

December 4, 2009 | [Michael O'Riordan](#)

Stavanger, Norway - High-intensity exercise training following PCI reduces in-stent restenosis, a new study shows [1]. Interval training, performed three times a week for one hour, also improved endothelial function and reduced inflammation, providing a possible mechanistic explanation, according to researchers.

"A training program should be a natural part of the treatment program for these patients," write lead author **Dr Peter Munk** (Stavanger University Hospital, Norway) and colleagues in the November 2009 *American Heart Journal*. "Medical therapy, mechanical revascularization, and physical rehabilitation are thus complementary and not competing strategies."

Current clinical guidelines recommend that all coronary artery disease patients exercise three to five days per week at 50% to 80% of exercise capacity for 20 to 60 minutes. Recent studies, however, have shown that high-intensity interval training was superior to moderate continuous aerobic training in improving exercise capacity and endothelial function in these patients, as well as those with ischemic cardiomyopathy and metabolic syndrome.

Testing the hypothesis that high-intensity interval training over six months following PCI could reduce late luminal loss in the stented coronary segment, the researchers randomized 40 individuals to treatment or to a control arm. Those randomized to the interval-training arm exercised three times per week for an hour. After a 10-minute warm-up, these patients increased their heart rate to 80% to 90% of maximum on an exercise bicycle or while running on a treadmill. These four-minute high-intensity intervals were followed by a three-minute recovery at 60% to 70% of maximum heart rate.

After six months, in-segment late luminal loss was 0.39 mm in the control arm and 0.10 mm in the training arm, a significant between-treatment difference. The reduction in late luminal loss among those randomized to interval training was consistent among drug-eluting stents and bare-metal stents. In fact, more patients received a drug-eluting stent in the control arm, report the researchers, and this "may further strengthen the results."

In addition to reductions in in-stent restenosis, peak oxygen uptake, flow-mediated dilation, and levels of high-sensitivity C-reactive protein (CRP) were all significantly improved among those who underwent interval training.

The results of this study, write Munk and colleagues, are hypothesis-generating for larger randomized trials and are particularly needed to reduce the use of stents to a "necessary minimum and to focus on the pathogenesis of the disease itself."

Source

1. Munk PS, Staal EM, Butt N, et al. High-intensity interval training may reduce in-stent restenosis following percutaneous coronary intervention with stent implantation: a randomized controlled trial evaluating the relationship to endothelial function and inflammation. *Am Heart J* 2009; 158: 734-741.