

Rethinking Daily Exercise: Less Regular, High-Intensity Intervals May Be Best Bet for Metabolic Syndrome

News Author: Shelley Wood

July 10, 2008 — Results of a small pilot trial showing that people with metabolic syndrome might benefit from an exercise regimen that includes aerobic interval training have now been published [1]. According to the Norwegian investigators who tested two different exercise regimens, high-intensity exercise actually reversed most of the risk factors associated with metabolic syndrome; after just 16 weeks of the exercise program, almost half the patients enrolled in this arm of the trial no longer had metabolic syndrome, without making any changes to their diets. Less impressive gains were seen with consistent, moderate exercise.

The findings were first reported by **heartwire** when they were presented during a poster session at the 2006 **International Symposium on Atherosclerosis**. Now, commenting on the published results, investigators say their findings hint that the standard recommendation for 30 minutes per day of moderate exercise — something espoused by the American Heart Association (**AHA**) and other organizations — might not be optimal in this specific high-risk group.

The results of the study by **Dr Arnt Erik Tjønnå** (Norwegian University of Science and Technology, Trondheim, Norway) and colleagues are published online July 7, 2008 in *Circulation*.

Less, but more

Senior author of the study, **Dr Ulrik Wisløff** (Norwegian University of Science and Technology), emphasized to **heartwire** that this was a three-times-per-week exercise regimen, totaling just 120 minutes.

"This is the first time a study has compared the real cardiovascular effects of exercise intensity in individuals with metabolic syndrome," he said. "Individuals who took part in the study exercised with different intensities but used the same amount of energy in each training session."

As previously reported by **heartwire**, 32 people with metabolic syndrome were randomized to continuous moderate exercise, aerobic interval training, or no specific exercise recommendations. A total of 28 patients completed the full 16-week trial and follow-up tests. Subjects in the moderate-exercise group exercised for slightly longer than those in the interval group, so that the amount of energy expenditure was the same between groups.

After 16 weeks of exercising three times per week, according to the randomization protocol, subjects in both exercise groups lost roughly the same amount of weight and reduced waist circumference, compared with the control group. But subjects in the interval group also experienced greater improvements in endothelial function, blood-pressure lowering, insulin sensitivity, fasting glucose, high-density lipoprotein (HDL) cholesterol, and mitochondrial biogenesis (a measure of cell's ability to produce fuel for work).

At the end of the 16 weeks, 46% of subjects in the interval group no longer met the criteria for metabolic syndrome, compared with 37% in the moderate-exercise group. All subjects in the control group met the criteria for metabolic syndrome at follow-up.

How to move on

The authors of the study hypothesized that the benefits of high-intensity intervals over consistent moderate exercise relate to the higher heart rates required for interval training. Patients in the interval group increased their ability to absorb oxygen by 35%, whereas those in the moderate-exercise group increased their ability to absorb oxygen by only 16%.

According to Wisløff, the study suggests there should not be a one-size-fits-all approach to exercise recommendations.

"Prescription of exercise training/physical activity should be different for individuals with metabolic syndrome and in inactive individuals," Wisløff told **heartwire**. "Look at the effects of today's recommendations: they do not work, or we do not get people to exercise as much as recommended. Instead, more and more people get fat and get metabolic syndrome."

He believes that most people with metabolic syndrome have not exercised regularly for at least five to 10 years, so committing to current exercise recommendations is a challenge.

"A lot of people find it hard to train most days of the week, and today's recommendations may therefore be a hindrance instead of a motivator for these persons," Wisløff said. "Our take-home message is that these people should try to perform the interval regimen described in the paper two times per week over 10 to 14 weeks. We normally see that these people get fit fast, and the only side effects of this 'medicine' observed so far is that they start to be more physically active on the other days of the week. We have clearly demonstrated that it is not possible to substitute exercise intensity with exercise duration: shorter and harder training sessions may be good medicine for improved fitness and reversal — and prevention — of established cardiovascular risk factors."

Dr Barry Franklin (William Beaumont Hospital, Royal Oak, MI), an AHA spokesperson and an author of the association's physical-activity guidelines, commented on the study's findings in a press statement. He points out that this is not the first study to show that if total energy expenditure of exercise is held constant, more vigorous-intensity exercise seems to convey greater cardioprotective benefits than exercise of a moderate intensity.

"However, these added benefits must be weighed against the potential for increased musculoskeletal and cardiovascular complications, as well as reduced compliance," he stated. "Accordingly, when previously sedentary individuals can comfortably exercise at a moderate intensity, they should consider the goal of more vigorous exercise, provided that it is sustainable and can be achieved without adverse signs or symptoms."

Consistent benefits of interval training across CVD subsets

According to Wisloff, he and his colleagues have conducted similar exercise studies in heart-failure patients and in patients with coronary artery disease; in both instances, aerobic interval training was superior to moderate exercise intensity in terms of its effects on heart, vascular, and skeletal-muscle function.

"Combined with the present study in individuals with metabolic syndrome where the majority will certainly get cardiovascular disease and die prematurely from cardiovascular causes, we are quite confident that this is an effective treatment strategy that now needs to be taken seriously by medical doctors," Wisloff and colleagues write.

His group is studying safety and survival data from this exercise program in a multicenter trial starting in this year called the **SmartEX** study. "Hopefully, this will give us valuable information two to four years from now," Wisloff said.

This study was supported by the Norwegian Council of Cardiovascular Disease; the Norwegian Research Council; Funds for Cardiovascular and Medical Research at St. Olav's University Hospital, Trondheim, and the Torstein Erbo's Foundation, Trondheim; the National Institutes of Health; and the US Department of Agriculture. The study authors have disclosed no relevant financial relationships.

Source

1. Tjonna AE, Lee SJ, Rognmo O, et al. Aerobic interval training versus continuous moderate exercise as a treatment for the metabolic syndrome. A pilot study. *Circulation*. 2008; DOI: 10.1161/CIRCULATIONAHA.108.772822. Available at <http://circ.ahajournals.org>.

The complete contents of **heartwire**, a professional news service of WebMD, can be found at www.theheart.org, a Web site for cardiovascular healthcare professionals.