

## ENDOCRINOLOGY

### Exercise May Not Counteract Too Much Sitting

Getting more exercise isn't enough to control weight for some women, according to researchers from the University of Leicester and the University Hospitals of Leicester NHS Trust, United Kingdom. They found that sedentary behavior alone (ie, all nonexercise sitting/lying down during waking hours) was associated with biomarkers linked to chronic, low-grade inflammation and poor metabolic health.

The researchers say this is the first study to look at the effect of self-reported sitting time on inflammatory adipokines (hormones released from adipose tissue) linked to the pathogenesis of type 2 diabetes. Studies have already incriminated sedentary behavior with increased adiposity, metabolic syndrome, abnormal glucose regulation, and death, independent of moderate-to-intense physical activity. The current study investigated the relationship between increased sitting time and C-reactive protein (CRP), leptin, interleukin-6 (IL-6), and adiponectin—all centrally involved in or linked to the inflammatory cascade.

The researchers gave questionnaires to 505 women who attended a diabetes screening program, including the question, "During the last 7 days, how much time did you usually spend sitting on a weekday?" Participants were also defined as nonsmokers, past smokers or current smokers, and according to whether they were taking antihypertensive or lipid-lowering drugs or aspirin.

Sitting time was positively associated with fasting insulin, CRP, leptin,



leptin/adiponectin ratio, and IL-6. After controlling for body mass index (BMI), all associations were weaker but remained significant after adjusting for moderate-to-vigorous physical activity. However, the findings were true of women, not of men. The associations between sitting time and markers of metabolic health were not only weaker in men, the researchers say, but reversed for some variables, which reached significance for CRP.

The gender-difference finding is similar to those from other studies that have shown TV-viewing time (a common surrogate measure of total sitting time) is more strongly associated with abnormal glucose metabolism and components of the metabolic syndrome in women than it is in men. The researchers note that other studies have also found the relationship between self-reported sitting time and all-cause mortality is stronger in women.

The reasons for this stronger relationship aren't clear, but some investigators theorize that when they're

physically active, men tend to engage in activities that protect against the effects of excess sedentary behavior. However, the possibility that the gender-specific differences might have been due to pathophysiologic or behavioral response to sitting-related behavior (eg, Do men or women tend to snack more while watching TV?) warrants further investigation, the researchers suggest.

The researchers add that their study should not be used to confirm a direct link between sitting time and metabolic health but should be a bridge to more research on the topic.

Source: *Am J Prev Med.* 2012;42(1):1-7.  
doi:10.1016/j.amepre.2011.09.022.

## CARDIOLOGY

### Myocardial Stiffness: Important Predictor of Survival in CHF

Increased myocardial stiffness may be a better predictor of survival in patients with congestive heart failure (CHF) than are other factors, such as left ventricular ejection fraction (LVEF), according to a small study by researchers from Kobe University Graduate School of Medicine and Hyogo Brain and Heart Center in Himeji, Japan.

In a previous study, the researchers showed that baseline B-type natriuretic peptide (BNP), a well-known marker of cardiac survival, is strongly related to LV myocardial stiffness. To the best of their knowledge, their current study is the first to assess the prognostic value of passive myocardial stiffness in determining survival chances in CHF.

They measured echocardiographic and hemodynamic variables over a

mean of 23 months in 37 patients, with the main endpoint being combined death or first readmission for CHF. Two patients died of cardiac events and 8 were readmitted for CHF.

Diastolic chamber stiffness and diastolic myocardial stiffness were higher in patients with events. Predischarge plasma BNP was also significantly higher in the patients with events compared with those without (363.0 vs 144.9).

The study found that conventional echocardiographic and hemodynamic parameters did not significantly contribute to the predictive power of BNP and myocardial stiffness. The researchers found no differences between the patients who died or who were readmitted and the others in terms of LV fractional shortening, LV mass index, end-diastolic stress, and other hemodynamic indices.

The researchers conclude that the primary factor responsible for recurrent decompensation depends on passive myocardial stiffness, regardless of hemodynamic and neurohormonal conditions. Further studies are needed, though, they add, to develop an easier method to calculate myocardial stiffness in vivo.

Source: *J Cardiol*. 2011;58(3):245-252.  
doi: 10.1016/j.jcc.2011.07.005.

## ORTHOPEDICS

### Promise of WBV Dimmed

Whole-body vibration (WBV)—a relatively recent therapy for osteoporosis—has been deemed promising because of animal studies that show significant improvements in bone formation rate, bone mineral density, trabecular structure, and cortical thickness. However, the effects of WBV on fracture risk and bone mass density (BMD) haven't been established, and recent randomized studies

### Twelve months of WBV ended in having no effect on volumetric BMD or bone structure at the distal tibia and distal radius or on areal BMD at the lumbar spine, total hip, or femoral neck.

have had conflicting results about efficacy. In search of answers, researchers conducted a yearlong study of WBV in 202 healthy postmenopausal women at the Toronto General Hospital, Ontario, Canada.

In WBV, the patient stands on a motorized oscillating platform that transmits vertical accelerations from the feet to the weight-bearing muscles and bones. In this study, investigators examined low-magnitude (0.3 gravity [g]) WBV at 90 Hz and 30 Hz because high-magnitude ( $\geq 1$  g) WBV has been shown to have deleterious effects in occupational settings. They chose 20 consecutive minutes of WBV, because the experimental models that demonstrated significant improvements examined 10 to 30 minutes of continuous WBV.

The women were randomly assigned to the 90-Hz or 30-Hz groups or to a control group. At baseline, WBV participants were asked to stand on the platform for 20 minutes daily for 12 months at home, erect, with neutral posture, and without excessive foot or body movement. (Sham WBV could not be provided to the control group.) All participants were given calcium and vitamin D supplements.

At 6 months, the researchers collected self-reports on adherence from the women, and at 12 months, they extracted actual adherence data from the machines' internal digital clock recordings of the sessions. Most participants were either 100% or 0% adherent, which made the adherence distributions bimodal and heavy in the extremes, so the researchers calculated medians. The 90-Hz and 30-Hz groups were similarly adherent (median, 79% vs 77%).

However, 12 months of WBV ended in having no effect on volumetric BMD or bone structure at the distal tibia and distal radius or on areal BMD at the lumbar spine, total hip, or femoral neck. For example, mean change from baseline was 0.4 mg/cm<sup>3</sup> for tibial trabecular volumetric BMD in the 90-Hz group,  $-0.1$  mg/cm<sup>3</sup> in the 30-Hz group, and  $-0.2$  mg/cm<sup>3</sup> in the control group.

Whether high-magnitude WBV would have a different effect remains unclear, the researchers say. Overall, they note, though, their study and others have not shown low-magnitude WBV to be effective for preventing bone loss in postmenopausal women who are receiving calcium and vitamin D supplements. They suggest that the therapy may be more successful in other populations, such as adolescents, patients with spinal cord injury, and institutionalized elderly, but they don't recommend it for postmenopausal women. ●

Source: *Ann Intern Med*. 2011;155(10):668-679.

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