Interrupting prolonged sitting with short bouts of walking attenuate postprandial triglycerides in normotriglyceridemic and hypertriglyceridemic, postmenopausal women

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Introduction
The incidence of cardiovascular disease (CVD) and mortality with prolonged sedentary time is highest in individuals with the lowest levels of physical activity (PA)¹. There is a substantial increase in the risk of CVD with increasing concentrations of non-fasting TG and with increasing age². Thus, regular interruption of sedentary time with PA may be of special importance as a strategy to prevent CVD within older adults. However, most previous studies examining postprandial metabolic responses to interrupting sitting time with PA have employed healthy young individuals³ and have compared postprandial metabolism with a day of prolonged sitting only. We compared the effect of different patterns of walking on postprandial triglyceride (TG) in postmenopausal women.

Methods
Fifteen normotriglyceridemic (fasting TG < 150 mg/dL), postmenopausal women aged 69 ± 3 yrs (mean ± SD) (Study 1) and ten hypertriglyceridemic (fasting TG ≥ 150 mg/dL), postmenopausal women aged 70 ± 5 yrs (Study 2) completed three trials in a random order: 1) prolonged sitting, 2) regular walking, and 3) prolonged sitting preceded by continuous walking. On the sitting trial, participants rested for 8 h. For the walking trials, participants walked briskly in either twenty 90-sec bouts over 8 h or one 30-min bout in the morning (09:00-09:30). Except for walking both exercise trials mimicked the sitting trial. In each trial, participants consumed a breakfast and lunch. Blood samples were collected in the fasted state and at 2, 4, 6 and 8 h after breakfast for the measurements of TG (as a primary outcome), and other metabolites, hormones and proteins.

Results
In Study 1, serum TG concentrations, differed significantly among trials (main effect of trial, P=0.008) with post-hoc tests indicating lower TG concentrations on the regular walking trial compared with both the prolonged sitting (P=0.007) and prolonged sitting after continuous walking (P=0.035) trials. In Study 2, serum TG concentrations, differed significantly among trials (main effect of trial, P=0.011) with post-hoc tests indicating marginally lower TG concentrations on the regular walking (P=0.080) and prolonged sitting after continuous walking trials (P=0.042) compared with the prolonged sitting trial.

Discussion
Our studies suggest that regular short bouts of walking taken to interrupt a period of prolonged sitting may reduce postprandial TG in postmenopausal women. In addition, one bout of walking may be sufficient to improve postprandial TG metabolism in hypertriglyceridemic, postmenopausal women. Given that regular leisure time physical activity only partly mitigates the effects of sedentary time on CVD risks our data are of value in showing that short breaks from sitting could provide additional benefit to CVD risk factors.

References
2) Nordestgaard BG, Varbo A. Lancet 2014; 384: 626-35