

Stair climbing and sedentary behavior with Type 2 diabetes

Joey Saavedra, Angelique Brellenthin, and Duck-chul Lee, FACSM

Iowa State University, Ames, Iowa

Purpose: Self-reported floor climbing (FC) significantly predicts major health outcomes, including mortality. There are no data on objectively-measured FC, independent of total physical activity, with health outcomes in older adults. We examined the associations between FC and the prevalence of type 2 diabetes mellitus (DM) in older adults.

Methods: This cross-sectional study included 488 older adults (56% women; mean age 72 years) who were without heart attack, stroke, or cancer in the past 5 years. FC was assessed with an accelerometer (FitBit Charge 2) worn on the non-dominant wrist for seven days. Average daily steps were assessed using a pedometer (Omron HJ-321). Participants were categorized into tertiles of FC or steps. For a joint analysis, participants were dichotomized into low (lower FC tertile) or high climbers (middle/upper FC tertiles) and inactive (lower step tertile) or active (middle/upper step tertiles). DM was defined by self-report, fasting glucose ≥ 126 mg/dL, or taking insulin. Logistic regression was used to calculate the odds ratios (ORs) and 95% confidence intervals (CIs) of DM while adjusting for sex, age, smoking, heavy alcohol consumption, percent body fat, hypertension, hypercholesterolemia, and FC or steps in respective analyses.

Results: Of the 488 adults, there were 47 (10%) DM cases. Compared with the lower FC tertile, the ORs (95% CIs) of having DM were 0.42 (0.18–0.94) and 0.31 (0.11–0.87) for the middle and upper FC tertiles, respectively, after adjusting for the full model including steps/day. Compared with the lower step tertile, the ORs (95% CIs) of having DM were 0.45 (0.20–0.99) and 0.47 (0.19–1.20) for the middle and upper step tertiles, respectively, after adjusting for the full model including FC. In a joint analysis, compared with the inactive and low climbers, the ORs (95% CIs) were 0.38 (0.15–0.97), 0.33 (0.11–0.94), and 0.16 (0.07–0.38) for the active and low climbers, inactive and high climbers, and active and high climbers, respectively.

Conclusions: Objectively-measured FC was associated with reduced odds of DM, regardless of daily physical activity. However, the joint analysis indicated the lowest odds of DM were among those who climbed ≥ 4 floors per day (high climbers) and walked $\geq 4,000$ steps/day (active).