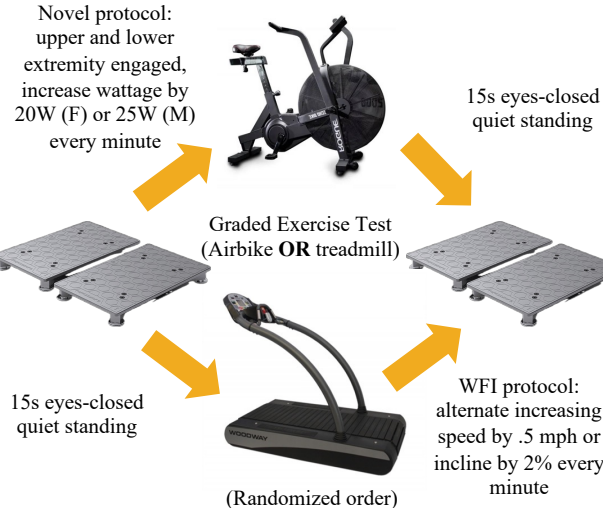


Introduction

- Professional, recreational, and tactical athletes regularly perform maximal effort exercise (MEE)
- The fatiguing nature of MEE may negatively impact postural stability (PS), which is critical for performance
- Decline in PS may increase injury risk due to slips, trips, and falls
- PS tends to decline following treadmill (TM) graded maximal exercise tests (GXT)
- Research suggest smaller PS declines in cycle ergometer GXTs
- A literature gap exists in exploring the differential effects of these exercise modes on PS

Methods

- Healthy adults: 9 male and 6 female, age = 29.1 ± 8.0 years, height = 1.74 ± 0.06 meters, mass = 76.0 ± 15.1 kilograms
- Participants completed both the Wellness Fitness Initiative (WFI) TM GXT and a novel airbike (AB) protocol on different days with 2-10 days between tests
- PS was assessed via 15s of eyes closed quiet standing on dual force plates before and after GXT
- A 2x2 Repeated measures factorial ANOVA with two levels of time (pre-, post) and MEE method (TM, AB) was conducted
- Cohen's d effect sizes are reported, alpha = 0.05

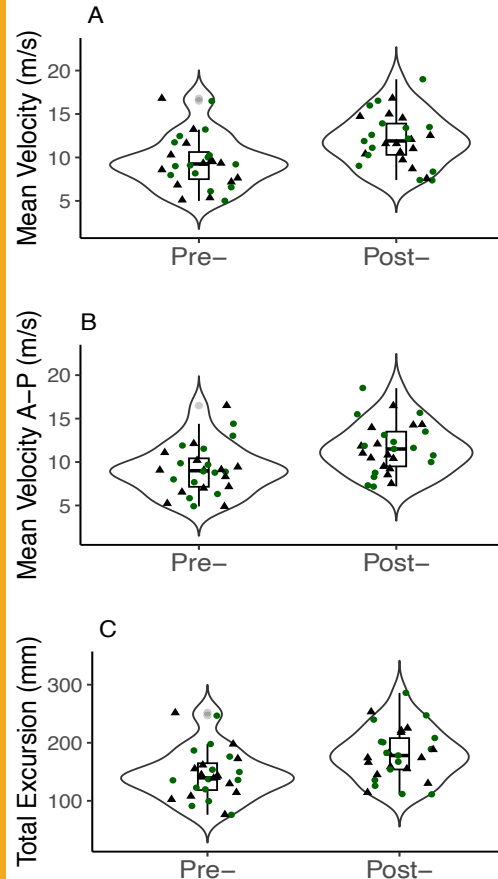


Purpose

To assess the effects on PS of two distinct modes of inducing maximal effort exercise, a GXT performed with a TM and AB

Figure 1: Pre- and Post-Exercise Postural Stability Measures

● = TM ▲ = AB



Key Findings

- Participants demonstrated **similar physiological responses** to the two exercise tests
- Postural stability decreased post AB and TM in terms of **mean velocity, mean velocity AP** (anterior/posterior), and **total excursion**
- No significant difference was found in postural stability between AB and TM



Results

- No difference for mean time to exercise failure ($p=0.767$), peak respiratory exchange rate ($p=0.114$), or RPE ($p=0.499$) between exercise methods, which suggests similar fatigue between the tests
- No significant impact of exercise method or interaction with time on any PS variable
- A significant and large time effect on mean velocity ($p=0.003$, $d=3.30$), mean velocity AP ($p=0.002$, $d=3.32$), and total excursion ($p=0.004$, $d=3.81$)
- Both GXTs altered PS similarly

Conclusions

- No significant difference in PS between GXTs, suggesting PS effects may not be specific to exercise method
- Previous research suggests PS decreases immediately following MEE and exceeds baseline values following 8-13 mins rest
- Limitation: only assessing PS immediately following MEE and not retesting PS after a recovery period

Practical Applications

- Take caution when continuing to exercise following MEE due to decreased PS, a known risk factor for injury
- Intersperse short breaks during maximal exercise
- Strength and conditioning professionals should avoid including demanding PS movements following MEE
- Future research should examine whether there are any differences between mode of MEE and time for COP measures of PS to return to baseline levels