
**Abstract**

The preferred transition speed (PTS) at which humans change their gait from walking to running was found to be lower than their energetically optimal transition speed (EOTS). This phenomenon has not been examined in racewalkers. The purpose of this study was to evaluate the PTS and the EOTS in racewalkers compared with controls.

**Methods:** Eleven racewalkers and 13 control subjects participated in this study. Subjects arrived at the laboratory on three occasions. Visit I: determination of PTS. Subjects walked at a slow speed that was increased by 0.2 km·h\(^{-1}\) every 30 s until they felt it was easier to run. Then, subjects ran at a high speed and the treadmill speed was reduced by 0.2 km·h\(^{-1}\) every 30 s until they felt it was easier to walk. Visits II and III: subjects walked and ran at PTS - 1 km·h\(^{-1}\), PTS - 0.5 km·h\(^{-1}\), PTS, PTS + 0.5 km·h\(^{-1}\), and PTS + 1 km·h\(^{-1}\). At each stage, physiological measurements were recorded.

**Results:** PTS was 7.33 ± 0.33 km·h\(^{-1}\) in controls and 8.20 ± 0.54 km·h\(^{-1}\) in racewalkers \((P < 0.001)\), and EOTS was 8.00 ± 0.48 km·h\(^{-1}\) in controls and 8.46 ± 0.55 km·h\(^{-1}\) in racewalkers \((P = 0.039)\). There was a trend for a smaller difference between PTS and EOTS in racewalkers. \(\dot{V}O_2\) was higher during running at the PTS in both groups \((F_{1, 22} = 5.972, P = 0.023)\), and there was a trend for a group interaction \((F_{1, 22} = 3.442, P = 0.077)\). HR and \(\dot{VE}\) were higher at the PTS in racewalkers compared with controls.

**Conclusion:** Racewalkers have a higher PTS and EOTS compared with controls. There is a trend for the difference between the PTS and the EOTS to be smaller in racewalkers compared with controls.