

The Effect of Alter Gravity Body Weight Supported Running on Workload: A Protocol PILOT Study.

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Abstract Text:

Purpose/Hypothesis: Bodyweight supported (BWS) running is commonly used during the rehabilitation process in runners. However, there has been no method of determining appropriate parameters required to allow subjects to run at consistent steady-state heart rates (SSHR) during unweighting. The purpose of this study was to determine the percent change in speed required to achieve steady-state heart rates at 10%, 20%, and 30% BWS on the Alter G treadmill (AlterG). Secondly, we wished to test for gender differences in SSHR and RPE at these 3 exercise levels.

Number of Subjects: Thirty participants recruited from Abilene Runners Club completed the full AlterG study protocol at Hardin-Simmons University.

Materials and Methods: Participants verbally completed the Physical Activity Readiness Questionnaire (PARQ). Resting HR and blood pressure were recorded. After being secured in the AlterG, participants performed a five-minute warm up, walking at 2.0 mph at 0% BWS then began Trial 1 (the control trial) by self-selecting a pace that is below their calculated lactate threshold. After 3 minutes at that pace, the participant's control and baseline steady state heart rate (SSHR) were recorded. BWS and treadmill speed were increased by 10% and 0.3 mph, respectively. SSHR was recorded during the last 10 seconds of the interval. If SSHR was achieved the participant progressed to the next trial. If SSHR was not achieved, the current 3-minute trial was repeated, adjusting treadmill speed ± 0.1 mph in relation to a high or low heart rate compared to the control trial. The same protocol was used for 20% and 30% BWS. After all trials, participants walked for five minutes at 2.0 mph at 0% BWS.

Results: Statistics were calculated using customized spreadsheets and SPSS version 25. Thirty participants (F=18, M=12), mean age 34.8 ± 10.48 years (range, 22-61), completed the full study protocol. Male and female runners demonstrated similar physiological responses with increasing BWS and treadmill running speed. One hundred percent, 67%, 97%, 97% of subjects achieved SSHRs during Trials, 1, 2, 3, and 4, respectively. The changes in speed required to achieve SSHRs during Trials 2-4 were extremely consistent and not different (4.56% - 4.72%). RPE was consistent and not significantly different between trials. Male and female subjects responded similarly in SSHR and RPE responses across trials.

Conclusions: For the majority of participants, a 10% increase in BWS and 4.56% increase in speed maintained a SSHR. Despite the increase in speed at higher BWS percentages, the participant RPE remained consistent suggesting no increase in running intensity. Further research is needed to generalize our results to a larger population and greater percentage BWS.

Clinical Relevance: Research is limited for training protocols on the AlterG. Our study found the majority of participants increased speed by 4.56% - 4.72% for each 10% increase in BWS and achieved SSHR. This protocol can be applied to runners dealing with injuries or as a general training guideline. Individuals can train their cardiovascular system at the same intensity by increasing both BWS and speed to achieve a SSHR in their desired HR zone.

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