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The G-Suit Has No Effect On Performance During A 40-Meter Sprint In Collegiate Athletes

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The G-Suit is a wearable device designed to increase axial loading through full-body compression. Previous investigations have demonstrated that an increase in axial loading on the human body improves core muscular activation. This activation may improve performance during an acute bout of sport and exercise.
PURPOSE: The purpose of this study was to test the hypothesis that wearing the G-Suit improves performance and muscular activation when compared to not wearing the G-Suit in male collegiate athletes during a 40-meter sprint.
METHODS: Fourteen male collegiate athletes (age: 20 ± 2 y, BMI: 26 ± 3 kg/m^2) participated in three randomized trials in which they completed a 40-meter sprint: a control session not wearing the G-Suit (CT), a session in which they wore the G-Suit for only the warm-up (WU), and a session in which they wore the G-Suit the entire time (GS). The subjects participated in a standardized warm-up before the sprint. Thereafter, maximum voluntary isometric contractions were completed for the rectus abdominis (RA) and the serratus anterior (SA) and these data were used to normalize muscular activation during the sprint. Sprint time (s) and sprint speed (m/s) were measured using a laser timing system. Feeling scale (a.u.) was self-reported (-5 = very bad, 0 = neutral, 5 = very good). Muscular activation (%) for the RA and SA were measured via electromyography. Data were analyzed using a one-way repeated measures ANOVA.
RESULTS: There were no significant differences between conditions for sprint times (CT: 5.76 ± 0.28 s, WU: 5.79 ± 0.38 s, GS: 5.74 ± 0.30; p = 0.78) and sprint speeds (CT: 15.84 ± 0.66 m/s, WU: 15.72 ± 0.98 m/s, GS: 15.76 ± 0.72 m/s; p = 0.80). There were also no significant differences between conditions for feeling scale (CT: -0.86 ± 1.34 a.u., WU: -0.93 ± 1.47 a.u., GS: -0.89 ± 1.27 a.u.; p = 0.93). Lastly, there were no significant differences between conditions for RA activity (CT: 107.3 ± 46.3 %, WU: 138.4 ± 62.7 %, GS: 98.8 ± 26.1 %; p = 0.04) and SA activity (CT: 80.7 ± 37.3 %, WU: 75.9 ± 32.9 %, GS: 72.7 ± 31.0 %; p = 0.77).
CONCLUSIONS: The increased axial loading from the G-Suit did not improve performance or muscular activation of the SA or RA during a 40-meter sprint in collegiate athletes. It appears that the axial loading provided by the G-Suit does not benefit collegiate athletes during an acute bout of exercise.

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The Physiological And Perceptual Demands Of Singles And Doubles Beach Tennis Sessions In Women

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Beach tennis is a racket sport played on a sand court, requiring 2 (singles) or 4 (doubles) individuals to play. It is characterized by high-intensity efforts (i.e., accelerations, decelerations, changeovers, and upper arm involvement) interspersed with low-intensity periods (i.e., active recovery between points and sets). Until now, no scientific report related to the specific demands of beach tennis is available.
PURPOSE: To analyze and compare the physiological and perceptual demands of singles and doubles beach tennis sessions in women.
METHODS: Twenty-two physically active participants (41±7 years old) randomly performed two experimental sessions: singles and doubles beach tennis. Each session was composed of 3 matches of 12 minutes with 2 minutes intervals. The games were played according to ITF beach tennis rules. Heart rate (HR)(Polar H10 monitor) and the number of steps (ActiGraph GT3X accelerometer) were continuously recorded during the sessions. Rate of perceived exertion (Borg CR-10 scale) and enjoyment (PACES scale) throughout the sessions were also assessed. Generalized estimating equation analysis was used to compare main effects between experimental sessions.
RESULTS: Maximum HR (HR_{max}: 181 vs. 170 bpm, $P < 0,001$), mean percentage of reserve HR throughout the session (%$HR_{reserve}$: 82 vs. 75%, $P < 0,001$) and percentage of total time at 91-100% HR_{max} (39 vs. 14%, $P < 0,001$) were higher in singles when compared with doubles. Similarly, the number of steps (2400 vs. 2149 steps, $P < 0,001$), and the rate of perceived exertion (5 vs. 3 A.U/ heavy vs. moderate intensity, $P < 0,001$) were higher in singles than doubles. No correlation between %$HR_{reserve}$ and rate of perceived exertion during singles or doubles were found (r = 0.24; $P = 0.28$ for singles, and r = 0.15; $P = 0.52$ for doubles). Enjoyment levels were similar after singles and doubles (115 vs. 117 A.U./ 91 vs. 93%, $P = 0.717$).
CONCLUSION: Singles beach tennis resulted in higher physiological and perceptual demands than doubles in women. Additionally, the use of rate of perceived exertion scales may not reflect the physiological demand during beach tennis.

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Collegiate Field Hockey Players Experience Different Exercise Loads Between Practices And Matches

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Field hockey involves considerable aerobic and anaerobic stress. Some of the training load and all of the on-field movement can be captured using heart rate monitors with global positioning systems.
PURPOSE: To evaluate differences in exercise demand between practice and competition settings in collegiate field hockey.
METHODS: We monitored 19 Division-1 female field hockey players for 88 consecutive days of their competitive season, comprising 51 practices and 20 games. All players wore Polar Team Pro devices (Polar Electro Inc., Bethpage, NY) during each practice and game. Dependent variables exported were mean heart rate (HR), mean HR percentage (HR%), duration spent at 90-100% of maximum HR, average speed, maximum speed, total distance covered, and training load score. Independent-samples t-test were conducted to compare game and practice metrics; where Levene's test for equality of variances was not met, we used Mann-Whitney U tests.
RESULTS: In practice settings, mean HR was 138.1 ± 15.7 bpm, mean HR% was 69.4 ± 7.9%, the duration spent at 90-100% of maximum HR was 2.9 ± 2.7 min, average speed was 2.9 ± 0.7 km/h, maximum speed was 23.7 ± 4.2 km/h, total distance covered was 3,866.4 ± 1,583.5 m, and training load score was 117.4 ± 63.6. In game settings, mean HR was 9.2 ± 1.1 bpm higher ($P < 0.001$; 95% CI: 7.2, 11.3), mean HR% was 4.6 ± 0.5% higher ($P < 0.001$; 95% CI: 3.6, 5.6), duration spent at 90-100% of maximum HR was 0.5 ± 0.2 min longer ($P = 0.008$; 95% CI: 0.1, 0.8), average speed was 3.8 ± 0.1 km/h faster ($P < 0.001$; 95% CI: 3.4, 4.2), maximum speed was 2.9 ± 0.3 km/h faster ($P < 0.001$; 95% CI: 2.4, 3.4), total distance covered was 1,694.8 ± 117.3 m farther ($P < 0.001$; 95% CI: 1,418.7, 1,971.0), and

training load score was 43.1 ± 4.0 higher ($P < 0.001$; 95% CI: 35.6, 50.5). Mann-Whitney U tests were performed for comparisons without equal variances: average speed ($U = 35{,}103.5$; $P < 0.001$), total distance ($U = 79{,}733.5$; $P < 0.001$), and training load score ($U = 83{,}201.5$; $P < 0.001$).
CONCLUSION: Athletes experienced greater physical demand in games compared to practices. Games had higher HR values, covered more distance, spent more time near maximum HR, reached higher speeds, and had higher training load scores. More intense practices that stimulate match settings should be considered to better prepare field hockey players for competition.

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The Effects Of Ischemic Preconditioning On Exercise Performance In Collegiate Cross Country Athletes

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PURPOSE: Determine if ischemic preconditioning (IPC) via blood flow restriction of the upper or lower limbs is effective at improving exercise performance in collegiate cross country runners.
METHODS: Collegiate cross country runners (n=16 [11 F, 5 M]) participated in this study during the 2022 competition season in an experimental, crossover study design. Participants underwent baseline testing including cardiorespiratory fitness (1.5 mile time-trial run time), muscular endurance (maximum wall sit, plank, and flexed arm hang durations), and resting upper and lower limb occlusion pressure (LOP) measures. Next, participants were assigned at random into one of three conditions (arm occlusion, leg occlusion, sham). For a three-week period, participants in the arm and leg conditions occluded both limbs simultaneously of their respective condition at 65% of LOP, and participants in the sham condition occluded either the arms or legs (randomly assigned) but at only 20% of LOP. All groups performed occlusion protocols for 10-15 minutes prior to running practices at least five days/week. Once the three-week period was complete, participants completed cardiorespiratory and muscular strength measures again. This procedure was repeated two more times, with participants changing conditions each time until all participants had completed three weeks in each condition. Change scores for each outcome were calculated for each condition, with 95% confidence intervals (CI) not overlapping 0 used to denote significant changes.
RESULTS: Results indicated a significant improvement in running performance in the arm occlusion condition (change [95% CI] in 1.5 mile run time: -10.4 [-17.1; -3.7] seconds), with no change in the leg occlusion (-3.2 [-10.5; +4.1] seconds) or sham (-1.3 [-6.7; +4.1] seconds) conditions. Moreover, there were no significant changes in wall sit, plank, or flexed arm hang measures for any of the conditions.
CONCLUSIONS: IPC had inconsistent effects on performance in collegiate cross country runners, but there was a significant improvement in running performance in the arm occlusion condition. Alternative occlusion protocols (different cuff pressures, occlusion durations, and/or timing of occlusion prior to exercise) might be necessary to maximize ergogenic effects of IPC in this population.

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The G-Suit Has No Effect On Performance During The Wingate Anaerobic Test In Collegiate Athletes

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The G-Suit is a wearable device that enhances axial load on the human body. Unlike other compression garments, it is postulated that an augmented axial load via wearing the G-Suit enhances core muscular activation. To this end, greater core muscular activation may acutely improve athletic performance.
PURPOSE: The purpose of this investigation was to test the hypothesis that wearing the G-Suit will improve performance and muscular activation during the Wingate Anaerobic Test (WAnT) in collegiate athletes when compared to not wearing the G-Suit.
METHODS: Fourteen male collegiate athletes (age: 20 ± 2 y; BMI: 26 ± 3 kg/m^2) completed the WAnT in three separate conditions: wearing the G-Suit for the entirety of the visit (G-Suit), not wearing the G-Suit at all (Control), and wearing the G-Suit during the warm-up only (Warm-Up). Following a standardized warm-up, subjects completed a WAnT in which they cycled as hard as possible for 30 seconds against 7.5% of their body weight. Peak power (W), mean power (W), and fatigue index (%) were measured during the WAnT. Subjects reported whole body feeling before and after the WAnT (-5 = very bad, 0 = neutral, 5 = very good). Electromyography was measured for the rectus abdominis (RA) and the serratus anterior (SA) and is expressed as a percentage (%) of maximal voluntary isometric contraction. Data were analyzed using repeated measures one-way ANOVA and the p value was set to 0.05.
RESULTS: There were no statistical differences between conditions for peak power (G-Suit: 899 ± 243 W, Control: 916 ± 216 W, Warm-Up: 842 ± 319 W; p=0.27), mean power (G-Suit: 365 ± 88 W, Control: 361 ± 106 W, Warm-Up: 338 ± 83 W; p=0.05), or fatigue index (G-Suit: 58 ± 7%, Control: 60 ± 11%, Warm-Up: 62 ± 9%; p=0.14). There were also no statistical differences for feeling change (G-Suit: -3.2 ± 2.7 a.u., Control: -2.7 ± 2.7 a.u., Warm-Up: -2.7 ± 2.4 a.u.; p=0.48). Lastly, there were no statistical differences between conditions for RA activity (G-Suit: 26 ± 21%, Control: 23 ± 12%, Warm-Up: 20 ± 8%; p=0.49) and SA activity (G-Suit: 45 ± 31%, Control: 49 ± 31%, Warm-Up: 36 ± 12%; p=0.43).
CONCLUSIONS: The increased axial load provided by the G-Suit during Warm-Up or G-Suit did not enhance performance, feeling, or muscular activation during the WAnT when compared to Control. Thus, wearing the G-Suit may not acutely improve anaerobic capacity.

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Effects Of A Farmers' Walk Exercise On Post-exercise Performance Measures

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The introduction of functional training movements, such as the farmers' walk carry (FWC), into athletic conditioning programs has become popular in recent years. However, due to the unique nature of these exercise, the use of them during in-season training is limited.
PURPOSE: To determine how the FWC may impact performance measures in the days following exercise bouts.
METHODS: Fourteen participants (23.4 ± 1.9 yrs., 170.7 ± 9.4 cm, and 82.7 ± 22.8 kg) were asked to perform 10 repetitions of a 20-meter normal walk condition (NWC) or FWC, which was randomized and counter-balanced among participants. The FWC protocol was performed utilizing a high-handled hex-bar with a weight