An Innovative Approach to Decreasing Concussions in Adolescent Female Soccer Athletes: 2370 Board #117 May 29, 9

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Treadmill Walking with Load Carriage Does Not Change Arterial Stiffness in Patients With Resistant Hypertension

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Numerous tasks of daily living include isodynamic exercise, e.g. walking with hand load carriage, which combines dynamic and isometric muscle actions. The acute impact of such activities on arterial stiffness of patients with resistant hypertension is poorly understood.

PURPOSE: To assess the effects of walking with load carriage on arterial stiffness, derived measures of central pressure and augmentation index in patients with resistant hypertension.

METHODS: Twenty patients (age: 58.6 ± 8.8 yrs; weight: 85.5 ± 10.3 kg; height: 166.5 ± 7.2 cm; 24h systolic and diastolic ambulatory blood pressure: 135 ± 3.2 mmHg, 81 ± 19 mmHg) were randomized to either walk 10 min on a treadmill at 3 km/h carrying no load (control session, CG) or a load of 10% of their weight on both upper limbs in two water carboys with handle (experimental session, EG). Carotid-femoral pulse wave velocity (cf-PWV) and pulse wave analysis in the radial artery were performed at rest and immediately after exercise by applanation tonometry. Student’s independent t-test was used to compare groups at baseline. A repeated measures analysis of variance was used to compare the changes over time (session x time).

RESULTS: No significant differences were observed at baseline between groups, except for gender (EG: 3 vs CG: 6 women). At baseline, women presented higher augmentation index at 75%pm (AIX@75%pm) than men (31.3 ± 7.8 vs 21.4 ± 4.8, p=0.015); then, the subsequent analyses were performed controlling for gender. The main result indicates that none of the sessions changed significantly AIX@75%pm (EG: 24.0 ± 10.7 to 25.2 ± 6.9 vs. CG: 27.7 ± 8.3 to 28.8 ± 7.6%, p>0.05) or cf-PWV (EG: 8.0 ± 0.9 to 8.5 ± 1.1 vs. CG: 8.8 ± 1.3 to 9.2 ± 1.8 m/s, p>0.05). Additionally, both sessions induced a significant and similar increase in peripheral and aortic systolic pressure, pulse pressures, and augmentation pressure; and induced a significant decreased in peripheral and aortic diastolic pressure.

CONCLUSIONS: An everyday activity such as walking while carrying a load on the upper limbs (aerobic exercise accompanied by upper limb isometric contraction) does not significantly increase arterial stiffness, augmentation index or derived measures of central pressure in patients with resistant hypertension.

Concussion Education Video Exposure Does Not Significantly Improve Youth Athlete Concussion Knowledge

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Few studies have investigated the effects of publicly available educational materials and reinforcement strategies on improving concussion knowledge among youth athletes.

PURPOSE: This study examined knowledge differences before and after a concussion education video intervention with and without in-person reinforcement.

METHODS: Participants were North Carolina (NC) and Arizona (AZ) youth athletes (n=225) that participated in football, boys/girls soccer, boys/girls ice hockey, and boys/girls lacrosse. Athletes were cluster-randomized by team to two study arms: 1) video with in-person reinforcement (RE) or 2) video with no in-person reinforcement (NoRE). Participants completed assess forms with parental consent prior to participation. A validated concussion survey was administered pre-intervention to establish a pre-post knowledge score. A mixed model ANCOVA (controlling for state of residence) examined intervention effects (a priori α=0.05).

RESULTS: A total of 180/225 participants (104 NoRE; 76 RE) completed all pre-post knowledge score questions and were included in the analyses. There were no age, concussion history, or previous concussion education differences between intervention groups (p>0.05). Arizona athletes’ pre-test knowledge was lower than NC athletes’ (p=0.001). When controlling for state, there was no intervention group by time interaction (F(1,177)=14.1; p<0.001) as there was no difference in post-intervention improvement between study arms. Regardless of group, there was no significant improvement in knowledge following the intervention (F(1,177)=0.070; p=0.792; post=25.1 (95% CI: 24.7, 25.5) vs. pre=23.0 (95% CI: 22.5, 23.5)).

CONCLUSIONS: In-person reinforcement did not enhance concussion knowledge changes following educational videos for youth athletes. In addition, no overall improvement in knowledge was observed following the videos, suggesting these types of educational materials are likely not effective at increasing overall knowledge among youth sport athletes. These findings suggest that additional educational methods, such as those that are more interactive and culturally relevant, should be explored.

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An Innovative Approach to Decreasing Concussions in Adolescent Female Soccer Athletes

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Concussion is a public health issue, fundamental to health promotion and injury prevention. Concussions are prevalent in adolescent athletic competition, in high-collision and non-collision sports. A history of previous concussion increases risk by a factor of three, female gender increases it 1.5 to 2.5 times, and female middle-school soccer players have 22.9 times increased risk during games. Non-collision concussions (indirect) may be primed by altered movement patterns from previous injuries, disruption of cervical proprioception, or musculoskeletal pain. Assessment of dynamic balance and functional movement allows identification of poor movement patterns or control.

PURPOSE: To assess a preventative movement-based warm-up routine designed to re-set aberrant afferent information from various systems (vestibular, somatic, ocular) for a cohort of high school female soccer players with prior concussions.

METHODS: A retrospective cohort study of convenience consisting of 17 Virginian high school female soccer athletes ages 15 to 18 during 2013-2014 season. Three players had suffered a concussion within the last 6 to 8 months. Athletes were assessed pre-season using the Lower Quarter Y-balance test (LQ-YBT) and the Functional Movement Screen (FMS). Cohort was instructed in a general warm-up placing emphasis on normalizing movement patterns (identified via the YBT and FMS), vestibular ocular reflex, and ACL-prevention exercises, which was performed during the entire season before practices and games.
RESULTS: Sixteen varsity high school female soccer athletes, ages 14 to 18 years, participated. The average FMS composite score was 15±2, with 2 athletes being below the injury risk score of 14, and another 3 scoring right at the cutoff. The difference from side to side for the composite LQ-YBT ranged from 5-8cm. A total of 10 athletes had differences, with 6 of the athletes had an anterior difference of ≥6cm, and 6 had a posterior difference of ≥6cm. These levels are predictive of a deficit in dynamic balance. There were no new, or repeat concussions during the soccer season.

CONCLUSIONS: The finding of no new or repeat concussions, suggests that the intervention may have helped and may indicate a new injury prevention paradigm.