A RANDOMIZED CLINICAL TRIAL OF RESISTANCE TRAINING ON HEAD-NECK SEGMENT DYNAMIC STABILIZATION IN MALE AND FEMALE INTERCOLLEGIATE SOCCER PLAYERS

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Objective: To determine if an 8-week cervical resistance-training program affects head-neck segment (HNS) dynamic stabilization in male and female soccer players. Design and Setting: Independent variables were gender, group (training vs. control), and time (pre vs. post-test). Participants were randomly assigned to a resistance-training group (RTG) or a control group (NCG). The RTG (9 males, 10 females) underwent a monitored 8-week cervical progressive resistance-training program that consisted of 3 sets of 10 repetitions of neck flexion and extension at 55 to 70% of their 10 repetition maximum. Participants in the NCG (8 males, 9 females) performed no cervical resistance exercises. Subjects: 38 DI soccer players [n = 17 males (age = 19.21 ± .918 years, mass = 74.33 ± 5.11 kg, and height = 69.87 ± 2.75 cm) and 19 females (age = 19.16 ± .898 years, mass = 62.15 ± 6.36 kg, and height = 64.93 ± 2.40 cm)] with no history of head or neck injury within six months of the study. Measurements: Kinematic measurements of HNS angular acceleration and displacement were assessed with the Peak Motus MAS (ICC = .98). Measurements of peak amplitude, area, and latency of the upper trapezius and sternocleidomastoid muscles were assessed with the Noraxon Telemetry System (ICC = .84). HNS kinematic and electromyographic variables were assessed during force application to the head of 50N. HNS flexor and extensor isometric strength were assessed also using a Microfet Hand-Held Dynamometer (ICC = .96). Statistical tests included MANOVAs and ANOVAs with appropriate follow-up ANOVA and t-tests (ά ≤ .05). Results: There were no kinematic or EMG training or gender effects. RTG post-test isometric flexor strength was 15% greater than pre-test (p < .001). Female’s neck girth increased 3.4% over time regardless of training group level (p < .001). Conclusion: Despite increases in isometric strength and girth, the 8-week isotonic cervical resistance training did not enhance HNS dynamic restraint during force application to the head in collegiate soccer players. This finding is relevant clinically because this traditional cervical training is purported to aid in protecting athletes from head injury but may not elicit the desired outcome. Future research should examine if higher intensity isotonic training as well as other types of training (e.g., plyometrics) cause the neuromuscular changes necessary to enhance head-neck segment dynamic restraint in soccer players and other populations. Key Words: Brain Injury, Head Acceleration.