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ORIGINAL RESEARCH

CHANGES IN DYNAMIC BALANCE AND HIP STRENGTH AFTER AN EIGHT-WEEK CONDITIONING PROGRAM IN NCAA DIVISION I FEMALE SOCCER (FOOTBALL) ATHLETES

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ABSTRACT

Background: Lower extremity injury commonly affects female soccer athletes. Decreased dynamic balance and hip strength are identified risk factors for lower extremity injury. Little is known about how these factors adapt to a training stimulus in this population.

Purpose: To retrospectively investigate changes in lower extremity dynamic balance and isometric hip strength in Division I collegiate female soccer athletes after participating in an eight-week strength and conditioning program.

Study Design: Retrospective, non-experimental cohort study.

Methods: As part of a standard testing battery, soccer athletes completed athletic performance pre- and post-testing separated by an eight-week off-season conditioning program consisting of overall strength and technical skill development. Testing included lower extremity dynamic balance assessment through the Star Excursion Balance Test (SEBT) and isometric hip abduction and external rotation (ER) strength testing, normalized to limb length and percent body mass, respectively. Athletes rested for one week prior to post-testing.

Results: Seventeen healthy Division I female soccer athletes (age: 18.8 ± 0.9 years, height: 1.7 ± 0.06 m, mass: 68.0 ± 8.2 kg) completed the protocol. Significant improvements in SEBT composite reach distance were observed in the dominant (DOM) (3.6 ± 4.8%, 95% CI: 1.1 to 6.0) and nondominant (NDOM) (4.8 ± 6.1%, 95% CI: 1.7 to 7.9) limbs. Significant improvements in DOM hip ER strength (2.4 ± 2.3%, 95% CI: 1.3 to 3.6) and DOM SEBT anterior reach (2.1 ± 2.8%, 95% CI: 0.6 to 3.5) were observed. Large effect sizes were observed for DOM and NDOM hip ER strength gains (0.87 – 1.0), while small-moderate effect sizes were noted for the anterior reach direction (0.40 – 0.66). Further, DOM hip ER strength gains were significantly associated with DOM anterior reach performance improvements ($r^2 = 0.37$, $p < .01$).

Conclusion: DOM hip ER strength gains appear to be associated with improved lower extremity dynamic balance on the ipsilateral limb for the SEBT anterior reach direction in collegiate, Division I female soccer athletes after an eight-week conditioning program. Future investigations should prospectively investigate intervention strategies to modify lower extremity injury risk factors in this population.

Level of Evidence: 2b

Key Words: Dynamic balance, hip strength, soccer, women

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Financial Disclosures: None

Statement of the Institutional Review Board approval of the study protocol: "The study submission and informed consent for the proposal referenced above has been reviewed and approved via the procedures of the University of South Dakota Institutional

Acknowledgements: Austin Stroeh, CSCS for sharing his strength and conditioning expertise

Review Board: Your study has been granted a waiver of the process of informed consent.

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