

DYNAMIC STABILIZATION IN COLLEGIATE FEMALE VOLLEYBALL PLAYERS: EFFECTS OF LEG DOMINANCE AND OFF-SEASON

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KEY WORDS: time to stabilization, hopping task, volleyball players.

INTRODUCTION: Adequate dynamic stabilization can be a key factor in preventing non-contact lower extremity injuries, especially in sports which require agile movements, such as volleyball. Individuals with functional ankle instability (FAI) took longer to stabilize in static and dynamic tasks when examining anterior/posterior (AP) and medial/lateral (ML) responses (Ross & Guskiewicz, 2004). In an effort to detect FAI in athletes, differences in time to stabilization (TTS) between post- and pre-seasons and between dominant and non-dominant legs should be identified. The purpose of the study was to identify those differences (post- vs. pre-season; leg dominance) across various hopping directions. It was hypothesized that the pre-season test and dominant leg conditions exhibit greater stability (i.e., shorter TTS) in all hopping directions.

METHODS: After a sufficient warm-up, collegiate female volleyball players ($N=8$) hopped onto a force plate (AMTI, Watertown, MA, USA), landing one-legged, from four different directions. The force data were collected for 10 sec, at 200 Hz. TTS was calculated in accordance with the procedures of Colby et al. (1999). Two (AP & ML) 2x2x4 mixed-design, repeated measures ANOVA examined the effects of season, leg dominance, and four different hopping directions (medial, lateral, 50% and 100% of leg-length forward hops) on TTS ($\alpha=.05$).

RESULTS: No main effects were found for season and leg dominance, but there was a main effect for hopping direction in both AP and ML forces (AP: ($F(3,21)=274.99$, $p<.001$), ML: ($F(3,21)=122.79$, $p<.001$)). No interaction effects were identified in Season*Leg Dominance, Leg Dominance*Hopping direction, Season*Hopping tasks, and Season*Leg Dominance*Hopping direction.

DISCUSSION & CONCLUSION: The results did not support the hypotheses that differences would be identified for all effects of season, leg dominance, and hopping direction. Between post-season and pre-season, the participants did not receive a specific treatment to improve the stability of their lower extremity, which may explain the lack of season main effect. During the season, two lower extremity injuries were reported (ACL tear & ankle sprain) among those tested. The hopping direction main effect indicates that TTS varies depending on the task; this is consistent with results from Wilkstrom et al. (2008). Building on this preliminary work, future studies should consider larger samples, different athletic populations, and specific treatment protocols to determine influences on dynamic stability.

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