ABSTRACT

THESIS: The effect of fatigue on lower extremity mechanics during the unanticipated sidecutting maneuver

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DATE: May, 2013

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Fatigue has been observed to affect lower extremity mechanics during the cutting maneuver. However, there is a lack of research examining the effect of fatigue and limb dominance on lower extremity mechanics during unanticipated sidecutting. Objectives: This research sought to assess mechanical differences pre- and post-fatigue and with respect to limb dominance. Design: Repeated measures. Methods: Thirteen female collegiate soccer and field hockey players performed right and left unanticipated sidecutting following the Yo-Yo Intermittent Recovery test (Yo-Yo IR), a two minute treadmill run at a predicted VO$_{2\text{max}}$, and maximum vertical jumps. Mechanical measures of ankle, knee, and hip motion were obtained during the stance phase of the cut. Repeated measures 2x2 ANOVAs were performed to look at fatigue and limb differences. Alpha level set a priori at 0.05. Results: At initial contact and peak stance, significant changes pre- to post-fatigue were observed. At initial contact there was a reduction in knee flexion angles along with increased ankle dorsiflexion angles post-fatigue. At peak stance: increased knee adductor moments post-fatigue; greater ankle eversion moments on the dominant limb (DL) as well as increased eversion moments...
post-fatigue for both limbs. There was a differential effect of fatigue on peak hip abduction angles and hip internal rotation angles at initial contact which were altered in the DL only; decreased hip adductor moments occurred post-fatigue as well as decreased power absorption. Conclusions: Results from this study indicate that lower extremity mechanics are altered as an effect of fatigue such that injury risk may be elevated.