THE EFFECT OF FATIGUE ON BIOMECHANICAL PARAMETERS ASSOCIATED WITH KNEE INJURY
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INTRODUCTION: It is well accepted that females sustain a higher incidence of anterior cruciate ligament injuries than males. Fatigue has been shown to alter landing kinetics in males by impairing neuromuscular function (Komi, 2005). The research to date neglected to examine the role of fatigue on jumping mechanics in females. Therefore, the purposes of this study are: to examine fatigue induced changes in jump kinetics and kinematics, and to identify gender differences. METHODS: Thirty subjects (15 females, 15 males) volunteered to participate in this study. Subjects signed an informed consent waiver in accordance with the rules of the University Human Subjects Board. Subjects were instructed to perform a maximum counter movement jump every 15 seconds for 25 minutes (100 jumps). Data were collected for every even numbered jump. Kinematic data was collected using 2 digital cameras set up to capture sagittal and frontal plane movement. The analyzed parameters were: knee angle at landing (sagittal plane and frontal plane), minimum knee angle (sagittal and frontal plane), horizontal distance between the knees at landing and the minimum distance after landing, and flight time. Force time data were collected for the same jumps using a Bertec force plate. The parameters that were analyzed using the force time curve were: jump height, peak impact force at landing, and the slope of the force curve from landing until the peak impact force. The jumps that were analyzed were jumps 6, 8, 10 and 12, considered non fatigued, and 88, 90, 92, 94 (considered fatigued). RESULTS: Cronbachs alpha scores for the nonfatigued (fatigued) jumps were: jump height 0.994(0.987), impact force 0.985(0.961), slope 0.958(0.722). Jump height decreased insignificantly and impact force and slope increased insignificantly for both males and females. With regard to the kinematic parameters the only significant difference was the dominant leg of the female jumpers showed a significant (p<0.05) increase in abduction at the knee. DISCUSSION: Because an increase in abduction at the knee has been associated with injury. These results seem to support the hypothesis that fatigue can contribute to non contact landing injuries.

REFERENCES:
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