

Department of Biomechanics

Doctoral Degree 2007

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Title	:	Adaptive gait characteristics of individuals with chronic ankle instability during barefoot and shod walking.
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Abstract	:	
<p>Despite the presence of much research, the reasons behind the development of chronic ankle instability in individuals post ankle inversion sprain are not clear. Chronic ankle instability has previously been investigated dynamically using 3D motion analysis during walking in very limited research work. In this study, gait analysis was carried out on fifty subjects (25 chronic ankle instability, and 25 age, gender, activity, and gait velocity matched controls) during barefoot and shod walking. Kinematic and kinetic pattern differences using the 3D motion analysis system combined with a force plate were established at 90%, zero%, 10% and 30% of gait cycle in the sagittal and frontal planes. The results of the study showed that during barefoot walking, chronic ankle instability subjects were significantly ($P < 0.05$) more inverted in the frontal plane compared with controls in the entire studied parts of gait cycle. Also, subtler joint motions appeared to be controlled by an evertors moment compared with an invertors moment in the controls. In addition to significant increase of ankle joint plantar flexion and inversion ($P < 0.05$), proximal adaptations in form of significant increase in ipsilateral hip joint adduction and lateral trunk lean towards the affected side were found during shod walking. These proximal adaptations are significantly correlated to ankle adaptation in the same plane. These changes should be considered during establishment of rehabilitation programs for persons with chronic ankle instability.</p>		
Key words	1.	Kinematics.
	2.	Kinetics.
	3.	Chronic ankle instability.
	4.	Barefoot walking.
	5.	Shod walking.
	6.	3D motion analysis.
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