DO ANKLE STABILIZERS INFLUENCE DYNAMIC STABILITY IN PERSONS WITH FUNCTIONAL ANKLE INSTABILITY?

Nicole Jacobs, Monique Butcher-Mokha, Kathryn Ludwig, Zarko Krkeljas

Barry University, Miami Shores, Florida USA

KEY WORDS: stabilization, jump landing, time to stabilization, ankle taping, ankle bracing

INTRODUCTION: Ankle sprains are the most common injury in the physically active, and reoccurrence rate is high. Repetitive ankle sprains can cause functional ankle instability (FAI), leading to deficits in balance, strength, and stability. Sports medicine professionals prescribe and administer bracing and taping as extrinsic methods of enhancing ankle stability. What is not clear is how these methods affect neuromuscular control during dynamic movements in persons with FAI. The purpose of this study was to determine the effects of taping and bracing on time to stabilization (TTS), as a measure of dynamic stability, in persons with FAI during two landing tasks.

METHODS: 12 physically active males and females with FAI participated in this study after being screened using a questionnaire and a clinical examination (Hubbard & Kaminski, 2002). A forward jump landing (FJL) was performed according to Wikstrom et al. (2004) where participants began a jump from 70 cm behind an AMTI force plate sampling at a rate of 600 Hz (gain 4000), as they leapt to 50% of their maximum jump height (tested earlier). A lateral jump landing (LDL) was performed from a 40 cm high jumping platform positioned to the side of the force plate. For both tasks, participants landed in the center of the plate on their FAI limb, and were asked to "stick the landing," holding it for 10 s. Three trials at each landing task under three stabilizer conditions (McDavid™ Lightweight Laced Ankle Brace, Model #199; Gibney ankle tape; control) were performed in random order. GRFs in the anterior/posterior (A/P) and medial/lateral (M/L) directions were calculated using Peak Motus software (ver. 8.2, ViconPeak, Centennial, CO), and were then used to compute TTS. Two 3 (stabilizer) x 2 (landing task) ANOVAs with repeated measures over both factors were calculated for A/P and M/L TTS.

RESULTS AND DISCUSSION: Preliminary results show a significant interaction for stabilizer and landing task in the A/P direction with post-hocs yielding smaller TTS values for the taped v. control conditions during the LDL, $p<.05$. No significant interaction was found for stabilizer and landing task in the M/L direction. There was a significant main effect for landing, $p<.001$, showing smaller TTS values in the FJL. See tables for means and SD.

Table 1. A/P TTS for stabilizer and landing types (s)

	Brace	Tape	Control
FJL	2.76±0.35	2.75±0.33	2.70±0.62
LDL	1.04±0.86	0.88±0.57	1.28±1.16

Table 2. M/L TTS for stabilizer and landing types (s)

	Brace	Tape	Control
FJL	1.21±0.42	1.20±0.40	1.14±0.41
LDL	2.97±0.33	2.94±0.23	2.86±0.52

CONCLUSIONS: Overall, taping and bracing produced similar stability outcomes. Ankle taping may improve A/P stability when landing from a lateral direction. Regardless of stabilizer, M/L dynamic stability is achieved quicker when landing from a forward direction.

REFERENCES:

Hubbard TJ, Kaminski TW. (2002). Kinesthesia is not affected by functional ankle instability status. *Journal of Athletic Training*, *37(4),* 481-486.

Ross, S.E. & Guskiewicz, K. M. (2003). Time to stabilization: A method for analyzing dynamic postural stability. *Athletic Therapy Today*, *8*, 37-39.

Wikstrom EA, Powers ME, Tillman MD. (2004). Dynamic stabilization time after isokinetic and functional fatigue. *Journal of Athletic Training*, *39(3)* 247-253.