The Influence of Directional Compression Tights on Muscle Activity and Performance in Recreational Alpine Skiers

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INTRODUCTION Recent studies reported reduced muscle activity in competitive alpine skiers using directional compression (DC). It is not known whether the effects of DC are limited to competitive skiers, or if similar changes would be observed in recreational skiers. The purpose of this study was to examine changes in hip and leg muscle EMG patterns in recreational alpine skiers when skiing with and without a lower body DC garment. **METHODS** 11 intermediate and expert skiers volunteered for this study. Subjects skied 2 days, 2 weeks apart, with DC and non-compressive (TNC) base layer in a randomized order. EMG of the gluteus medius (GMED), rectus femoris (RF), and adductor longus (ADL) were recorded using surface EMG during measurement runs. Two measurement runs with standardized turns were taken on each visit. Subjects free skied for 1.75 hrs between measurement runs. This sequence of ski runs was replicated on the second testing day. Standardized turns were normalized to 100% turn duration and averaged together for each trial in each condition. A 2x2 ANOVA with repeated measures was used to compare turn time, edge angle, RMS, and MF within trials. Paired t-tests were used to compare percent change (%Δ) RMS, MF and self-paced skiing between trials. **RESULTS** Subjects skied more runs (8.0 ± 1.5 vs. 5.6 ± 1.8; $p<0.05$) and vertical (1969 ± 489 m vs. 1382 ± 304 m; $p<0.05$) during free skiing with DC than TNC. No differences were observed between trials for turn duration or edge angle. Although no statistical differences in %Δ RMS or MF were found, there was a trend towards smaller magnitude %Δ MF with DC (Table 1). **CONCLUSIONS** Although there were no differences in muscle activity between trials in either condition, subjects improved their self-paced skiing performance in the DC condition. There was also a trend towards smaller %Δ MF the DC condition. Further research should investigate the biomechanical influence of DC on skiing performance.

Table 1 % Δ RMS & MF	*DC–RMS*	*TNC - RMS*	*DC-MF*	*TNC-MF*
GMED	55.0 ± 126.7	-17.0±75.3	11.9±37.0	8.9±36.5
RF	12.9±88.6	-36.6±48.0	-1.3±16.9	-6.8±23.6
ADL	12.7±65.2	-2.9±55.45	-2.5±22.0	10.3±36.1

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