

Department of Biomechanics

Doctoral Degree 2009

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Title	:	Effects of different inclinations of laterally wedged insoles on gait mechanics in patients with medial knee osteoarthritis.
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Abstract	:	<p>Laterally wedged insoles have recently attracted attention as a conservative intervention for treating medial compartment knee osteoarthritis. The purpose of the study was to examine the effects of different insole inclinations on the frontal plane hip, knee, subtalar moments, and pelvic alignment. The tested insole inclinations were 0, 6, and 11 degrees. The 0° non-wedged insole was used bilaterally '0°x0°' as a control. Whereas, each of the 6° and 11° laterally wedged insoles was used once unilaterally with a 0° non-wedged insole used on the un-tested limb '6°x0° and 11°x0°' and another bilaterally '6°x6° and 11°x11°'. Kinetic and kinematic gait parameters were collected from 33 patients with primary medial compartment knee osteoarthritis (mean age 55.03 ± (7.52), mean height 1.57 m ± (0.06), and mean weight 83.61 kg ± (8.81)). The dependent variables were compared among the five tested insole conditions using MANOVA and to magnify the effect of subtalar moments direction, two repeated measures ANOVAs were used with the initial alpha level set at 0.05 with subsequent Bonferroni adjustments. Additionally, correlations were conducted to study the relationships among lower limb joint moments. Findings revealed insignificant differences in the tested dependent variables among the five tested insole conditions. However, considering the direction of subtalar moments, there was a statistically significant increase in the external subtalar eversion moment between each of the '6°x0°, 6°x6°, 11°x0°, and 11°x11°' vs the '0°x0°' insoles (p = 0.000) in patients showing consistent subtalar eversion moment. Similarly, there was a statistically significant decrease in the external subtalar inversion moment between the '11x11' vs the '0x0' insoles (p = 0.014) in patients showing consistent subtalar inversion moment. Finally, there were insignificant weak negative (r = -0.059, p = 0.583) and insignificant weak positive (r = 0.203, p = 0.203) correlations between the first peak knee adduction moment and each of the external subtalar eversion and inversion moments in patients with consistent subtalar eversion and inversion moments respectively. These correlations may support the proposed mechanism of insoles being able to successfully shift the ground reaction force vector laterally which may be responsible for reducing the external knee adduction moment.</p>
Key words	1.	Laterally wedged insoles.
	2.	Medial knee osteoarthritis.
	3.	Frontal plane moments.
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