“MOBILITY” FOOTWEAR REDUCES DYNAMIC LOADS IN SUBJECTS WITH OSTEARTHRITIS OF THE KNEE

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Purpose: Dynamic joint loading is important in the pathophysiology of osteoarthritis (OA) of the knee, and the prevalence and progression of knee OA are known to be associated with high dynamic loading. We have previously demonstrated that in subjects with OA of the knee, walking barefoot significantly decreases peak knee loads compared to walking with standard walking shoes. [Arthritis Rheum 54:2923, 2006]. These results suggest a potential biomechanical advantage of “natural foot mobility” for lower extremity joint loading. Subsequently, we designed a shoe to incorporate essential features of natural foot motion. Here, we compare both peak and overall knee loads when walking with this “mobility” shoe compared to walking with conventional walking shoes.

Methods: Thirty-one subjects with radiographic and symptomatic knee OA underwent gait analyses using an optoelectronic camera system and multi-component force plate. Subjects were evaluated for gait while 1) wearing a “mobility” shoe, designed to provide maximum foot flexibility and motion and 2) wearing their self-chosen conventional walking shoes. Subjects walked at their normal walking speed, and comparisons were performed on runs matched for speed. The primary endpoints for the study were gait parameters that reflected the extent of medial compartment knee loading and included the peak external knee adduction moment (PAddM) and the adduction angular impulse (AddImp). The PAddM is the external adduction moment of greatest magnitude during the stance phase of the gait cycle. The AddImp is the integral of the knee adduction moment over time and has recently been shown to be more sensitive than the PAddM in predicting the radiographic severity of medial compartment knee OA. Paired t-tests were used to compare differences in these parameters during the two footwear conditions.

Results: 27 females and 4 males were evaluated, with mean age (±SD) of 61±11 years. There were no significant differences in speed during the walking conditions (1.16 ± 0.23 vs 1.15 ± 0.25 m/sec, p=0.842). There was an 8% reduction in the PAddM (2.73±0.76 vs 2.51±0.80 %BW*ht, p<0.001) and a 7% reduction in the AddImp (0.96±0.45 vs 0.89±0.45 %BW*ht, p<0.016) with the “mobility” shoe compared to subjects’ conventional walking shoes.

Conclusions: This study demonstrates that a shoe designed to incorporate the biomechanical advantages of barefoot walking effectively reduces dynamic knee loads during gait. In light of these findings, closer examination of the design and biomechanical effects of modern footwear on the prevalence and progression of lower extremity OA is warranted.

INDIRECT COMPARISON OF CLINICAL EFFICACY ACROSS COCHRANE REVIEWED PHYSIOTHERAPY INTERVENTIONS FOR PATIENTS WITH OSTEARTHRITIS: A META-ANALYSIS WITH MIXED TREATMENT COMPARISONS

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Purpose: There have been numerous of systematic reviews of interventions designed to diminish pain and improve function for patients with OA, but the comparable effectiveness of such interventions is unclear. To assess the clinical efficacy of physiotherapeutic (PT) modalities and interventions available in the Parker Institute, Frederiksberg Hospital, Copenhagen, Denmark; 2 Institute of Sports Science (August Krogh Institute), Copenhagen, Denmark

Purpose: To assess the effect of whole-body vibration exercise on muscle strength, proprioceptive acuity, and balance in female patients with knee osteoarthritis (KOA).

Methods: This study was a singleblinded, randomised, con-