GAIT AND POSTURE IN ARTHRITIC AND HEALTHY KNEES

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INTRODUCTION: The gait characteristics of patients with OA of the knee have been well-studied and reported; however, less attention has been paid to the postural differences between OA affected and healthy knees. The aim of this study was to investigate the postural differences that may affect the gait in an OA group compared to the controls.
METHOD: Subjects (n=17) were community–dwelling women (age >40 yrs) with OA in at least one knee according to the American College of Rheumatology criteria confirmed by magnetic resonance imaging and clinical examination. Seventeen body mass index-matched asymptomatic women were recruited from the general population in good general health with no history of knee pain or injury. A three-dimensional motion analysis system was used to collect the biomechanical gait data during self-selected habitual speed and internal moments were calculated using inverse dynamics. Digital K400 Keiser pneumatic resistance machines were used to perform one repetition maximum test unilaterally on knee extension according to (de Vos & Singh et al. 2005). Comparisons between groups were made by applying an analysis of covariance (ANCOVA) with age added to the model as a confounding variable at $p < 0.05$.
RESULTS: Approximately 88% of the patients had OA in medial compartment and 30% had severe OA. Maximum knee extension strength was lower in the OA group compared to the matched controls (p=0.023). The OA group had higher hip abduction angle (p=0.004) and greater knee adduction moment (KAM) (2.80±1.12 vs. 2.22±0.59 %BWxHt, p=0.542) than controls. In addition, at 30% of the stance phase shank adduction angle was correlated with KAM (r=0.39, P=0.026) and was greater in the OA group than controls (5.1±2.8 vs. 2.9±2.21, p=0.012), shown in Figure 1.
DISCUSSION: Shank adduction angle reached its peak around 30% of the stance phase where KAM was at its peak value. Knee and shank adduction angles were the best predictors for KAM at 30% of stance phase and explained 61% of the variation in KAM. Further prospective investigation is required to identify whether loss of cartilage thickness on the medial side causes the difference in shank angle or if biomechanics of gait predispose to progression of OA.
CONCLUSION: Understanding the modified strategies applied by patients to overcome their pain may be an important aspect to consider in enhancing their ability to participate in sports.

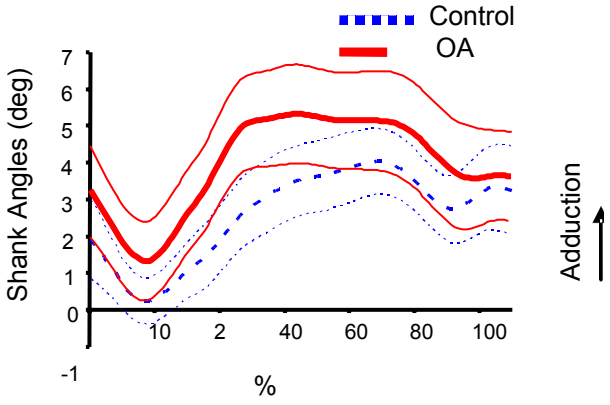

Figure1 Shank Varus-Valgus Angles (degree), thin lines indicates ±95%

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