

## Publication

Kinematic changes in patients with severe knee osteoarthritis are a result of reduced walking speed rather than disease severity

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Kinematic changes in patients with knee osteoarthritis (OA) have been extensively studied. Concerns have been raised whether the measured spatiotemporal and kinematic alterations are associated with disease progression or merely a result of reduced walking speed.; The purpose of this study was to investigate the effect of walking speed on kinematic parameters in patients with knee OA using statistical parametric mapping (SPM).; Twenty-three patients with unilateral knee OA scheduled for a total knee replacement and 28 age matched control subjects were included in this study. Spatiotemporal parameters and sagittal plane kinematics were measured in the hip, knee, and ankle using the inertial sensors system RehaGait<sup>®</sup> while walking at a self-selected normal (patients and controls) and slow walking speed (controls) for a distance of 20 m. Gait parameters were compared between groups for self-selected walking speed and for matched walking speed using SPM with independent sample t tests.; At self-selected walking speed, patients had significantly lower knee flexion during stance (maximum difference, -6.8°) and during swing (-11.0°), as well as higher ankle dorsiflexion during stance phase (+12.5°) and lower peak hip extension at the end of stance compared to controls (+4.2°). At matched speed, there were no significant differences in joint kinematics between groups.; Differences in sagittal plane gait kinematics between patients with knee OA and asymptomatic controls appear to be mainly a result of reduced walking speed. These results emphasize the importance of considering walking speed in research on gait kinematics in patients with knee OA and in clinical trials using gait parameters as outcome measures.

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