Title: Changes in the symmetry of external perturbations affect patterns of muscle activity during gait initiation

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Gait & Posture

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Highlights

- External perturbation did not affect the temporal order of COP and body movements.
- Shank, thigh, and trunk play different roles in gait initiation while perturbations.
- Muscle activities are corresponding to the step and the symmetric perturbations.

Abstract

Background: Gait initiation is associated with changes in the steady state and experiencing an external perturbation during initiation of gait could further threaten balance stability. **Research question:** The aim of the study was to investigate if changes in the symmetry of the perturbations affect patterns of muscle activity during gait initiation. **Methods:** Eleven young health participants were instructed to stand on the force platform and wait for the instruction of taking a right step, left step or stand still while experiencing a pendulum perturbation applied to the back of both shoulders (symmetric), back of the right shoulder (asymmetric) or no perturbations. Bilateral electromyographic activity (EMG) of dorsal and