

## **Abstract**

**Objective:** To investigate the functional effects of bilateral botulinum toxin A (BTX-A) treatment and subsequent stretching of spastic hip adductors on gait and reactive lateral stepping responses in patients with pure hereditary spastic paraplegia (HSP).

**Design:** Explorative pre-post intervention study

**Patients:** Twenty-five patients with pure HSP

**Methods:** Patients were treated with bilateral BTX-A injections in the hip adductors and performed daily self-administered stretching exercises for 16 weeks. Before the intervention (T0), and 6 (T1) and 16 (T2) weeks thereafter, we assessed gait width, gait speed, and leg angles at first stepping-foot contact after lateral balance perturbations, as well as the corresponding success rates of reactive lateral steps.

**Results:** Compared to baseline, gait width increased by 12.6% and 9.7% and comfortable gait speed by 8.3% and 11.5% at T1 and T2, respectively. In known perturbation directions, leg angles increased by 5.9% at T1 and 8.0% at T2, while success rates increased from 70% at baseline to 90% at T1 and T2. No effects were found for maximal gait speed or lateral stepping responses in unknown perturbation directions.

**Conclusions:** BTX-A treatment and subsequent stretching of the hip adductors may improve gait and reactive lateral stepping in patients with pure HSP.

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