

THE USE OF POINT-OF-CARE KINEMATIC ANALYSIS IN THE TREATMENT OF FOCAL SPASTICITY

Rudolf Ditmar¹, Nicole Musilová¹, Marika Kolářová²

¹ University Hospital Olomouc, Czech Republic

² Palacky University Olomouc, Faculty of Medicine, Czech Republic

e-mail: ditmarrudolf@gmail.com

Background

Kinematic assessment in the treatment of focal spastic paresis offers valuable insights into the factors influencing gait and overall movement in patients, thereby guiding treatment interventions, such as botulinum toxin injections and physical therapy. The kinematic evaluation of candidates for botulinum toxin therapy could refine treatment targeting. In clinical practice, the availability of a kinesiological laboratory presents an obstacle for most ambulatory specialists. Nonetheless, it is essential to distinguish between the various contributors to movement impairments, including muscle weakness and reduced motor control, as these factors significantly affect rehabilitation approaches for individuals with spastic paresis.

Case report

We present a case series of patients with focal spastic paresis of the lower limb after ischemic stroke, where point-of-care gait kinematic evaluation, using high-speed video recorder with kinematic software, that was used for determining candidate muscles for botulinum toxin treatment. The evaluations were performed as a part of gait testing commonly used with prof. Gracies' therapeutic concept of focal spastic paresis. Gait speed, stride length, and joint goniometry were measured and evaluated. After analysis, the muscle map was established, and ultrasound-guided application of the botulinum toxin with electrophysiological verification of the contractibility of the selected muscles was performed. After 1 month, patients were reevaluated and the measurements compared with prior data. The muscle compensation strategies, spastic co-contractions and synkinesis were evaluated to appraise selected spastic muscles. The kinematic feedback leads to increased motivation for self-rehabilitation among patients and also inspires them as they experience measurable progress in their movement abilities.

Conclusion

The integration of personalized goals and innovative treatment methodologies, coupled with continuous evaluation of movement through kinematic analysis, ultimately contributes to more effective rehabilitation. This approach not only facilitates the alignment of kinematic assessments with patients' specific rehabilitation goals, but also optimizes the management of spastic paresis and enhances patient engagement in the treatment.

Keywords: Kinematic analysis, focal spasticity, botulinumtoxin