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Posters - Hall 1

RESIDUAL DELAY IN HAND GRASP RELEASE IN INDIVIDUALS WITH MILD POST-STROKE HEMIPARESIS

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Background: Due to the lack of efficient neural communication between the central nervous system and forearm musculature, individuals with post-stroke hemiparesis have difficulties initiating and terminating their hand grasp, keeping their grasp stable, and matching grasp strength to the manipulating task. The mechanisms of grasping and their impairments after stroke have been actively investigated. Less is known about how a unilateral stroke may affect grasp release.
Purpose: The study investigated the timing of grasp and grasp release in 10 individuals with mild post-stroke arm paresis and 10 matched healthy control subjects.
Methods: During a single experimental session, participants sat in a chair with the involved extremity placed comfortably into the arm rest with their hand and fingers around the a bottle-like handle of specially designed manipulandum. Prompted by two sequential auditory cues, participants gripped and released the handle, placed in one of 5 wrist positions, between 60° of wrist flexion and 60° of wrist extension with a 30° increment. The grasp was compared between the paretic arm in the stroke group and the dominant arm in the control group and between 5 wrist positions on the following parameters: latency of grasp initiation, time of grasp and release, maximal grip force, and a time of exerting maximal force.
Results: The result showed that the stroke group required longer time to terminate grip, when compared to the control group. No other significant between-group differences were observed, regardless of the wrist position. None of the participants with stroke showed limited extension range of motion for the wrist and hand digits, and severely decreased strength of hand muscle extensors that could affect an ability to open hand prior to initiating grasp.
Conclusion(s): Participants with mild-to moderate arm spent more time to release the grasp than the control individuals, while the rest of grasp characteristics were similar in both groups. This suggests that grasp release remains as a residual impairment even in patients with well-recovered arm and hand functions post-stroke.
Implications: This hand impairment should be taken into account when planning therapeutic exercises for individuals with post-stroke arm and hand paresis.
Key-words: 1. grasp release 2. stroke 3. rehabilitation
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