

Method First we assessed initial motor potentials by using the actimeter on healthy upper limbs and damaged ones. This was carried out before the CIMT program. This initial phase defines the activity temporal asymmetry between the damaged and healthy side. The patients are assessed again over two weeks during CIMT. The activity reduction of the healthy side allows us to evaluate the patients' commitment and motivation. For obvious reasons, all subjects with low compliance were excluded. During the final phase, after 4 weeks of CIMT, the actimeters were kept in place for an extra week in order to observe the treatments' efficiency. So, we can now quantify the new balance of bimanuality.

Results In this study, we recruited seven patients. Six of them showed a compliance of 20 to 60%. The last patient was excluded for non-compliance to the protocol. The six subjects showed evidence of a higher level of activation of the injured side.

Conclusions This preliminary study shows that actimeters allow to verify patients' compliance to CIMT and also to quantify the efficiency of the treatment after it ends.

Keywords Actimetry; Compliance; Constraint induced movement therapy

Disclosure of interest The authors have not supplied their declaration of conflict of interest.

<http://dx.doi.org/10.1016/j.rehab.2015.07.027>

P002-e

Proprioceptive illusion induced by tendon vibration on the upper limb in stroke patients



C. Provost^{a,*}, S. Tasseel-Ponche (Dr)^a, L. Genty^a, F. Delcombre^a, P.P. Vidal^b, A. Yelnik (Prof)^a

^aUFR de médecine, service de MPR, groupe hospitalier Saint-Louis – Lariboisière – F.-Widal, AP-HP, université Paris Diderot, Paris, France
^bCOGNITION and ACTION Group (COGNAC-G), UMR 8257: CNRS-IRBA, université Paris Descartes, Sorbonne Paris Cité, France

*Corresponding author.

E-mail address: clement.provost@aphp.fr (C. Provost)

Introduction Muscle vibration leads to agonist muscle contraction and antagonist muscle relaxation, this is the Tonic Vibration Reflex (TVR) [1]. Central nervous system interprets tendon vibration as a lengthening of this one inducing a virtual movement sensation [2]. The objective of this study is to observe this effect after stroke.

Method Thirty-eight subjects have been evaluated: 19 stroke patients (10 men, 60.7 ± 9.8 years old) and 19 healthy subjects (5 men, 56 ± 11 years old). Vibrators (VibraSens VB200, TechnoConcept) were placed on the biceps brachii and wrist flexors tendons. Each subject received a vibration (80 Hz, 40 s) for each upper limb. An accelerometer was placed on the forearm in order to quantify the TVR with the elbow flexion angle. Movement perception of the subject was highlighted through a perception score created for the study. Subjects were seated on a chair, blindfolded, dangling arm.

Results Flexion angle of the elbow (TVR) was identical on the left (32.2 ± 22.9°) and right (35.2 ± 32.2°) healthy subjects upper limb. For stroke patients it was identical on the healthy upper limb (33.1 ± 21.2°) compared to the upper limb of healthy subjects but greatly decreased on the deficient upper limb (9.6 ± 13.7°) of stroke patients compared to their healthy upper limb ($P = 0.0003$). Perception score was less important on the hemiplegic side than the healthy side ($P < 0.0001$) and was correlated to motor impairment (Fugl-Meyer) ($P < 0.0001$, $r = 0.687$) and spasticity ($P < 0.00001$). Anaesthesia was not correlated to a low score of perception, but only 3 subjects were concerned.

Conclusion TVR and usual movement illusion under tendon vibration are affected on the hemiplegic side after stroke. Any relationship or not on the observed deficiencies require confirmation with a larger sample.

Keywords Tendon vibration; Stroke; Perception; Upper limb

Disclosure of interest The authors have not supplied their declaration of conflict of interest.

References

- [1] Hagbarth K, Eklund G. The muscle vibrator – a useful tool in neurological therapeutic work. *Scand J Rehabil Med* 1969;1(1):26–34.
- [2] Roll JP, Albert F, Thyriion C, Ribot-Ciscar E, Bergenheim M, Mattei B. Inducing any virtual two-dimensional movement in humans by applying muscle tendon vibration. *J Neurophysiol* 2009;101(2):816–23.

<http://dx.doi.org/10.1016/j.rehab.2015.07.028>

P003-e

Beyond stroke: Impact of the lesion side on the recovery of between-hands coordination



J. Metrot (Dr)^{a,*}, D. Mottet (Prof)^a, J. Froger (Dr)^{a,b}, I. Laffont (Prof)^{b,c}

^aMovement to Health, université de Montpellier, Montpellier, France

^bDépartement de MPR Le Grau-du-Roi, CHU de Nîmes, France

^cDépartement de MPR, CHRU de Montpellier, France

*Corresponding author.

E-mail address: julien.metrot@univontp1.fr (J. Metrot)

Objective One-fit-all post-stroke rehabilitation has limited plausibility. Better understanding the effects of the lesion location on the recovery process may help to develop new tailored therapeutic strategies to individuals. The purpose of this study was to assess the natural evolution of bimanual coordination over standard rehabilitation according to the lesion side, aiming to identify a potential responder-profile for bimanual-oriented therapy.

Material/patients Twelve hemiparetic, moderately impaired patients were included within 30 days after a first unilateral stroke. The kinematic and clinical assessments were performed once a week for 6 weeks and at 3 months after inclusion. The patients performed a reach-to-grasp task in unimanual condition followed by a synchronous bimanual condition. The clinical evaluation included the Fugl-Meyer Assessment, Box and Block Test, 9-Hole Peg Test and Barthel Index.

Results The clinical scores indicated no difference in motor function between left- (LHD) and right-hemispheric damaged (RHD) patients over time. Interestingly, the LHD patients produced smoother bimanual reaching movements than the RHD patients while we found no effect of the lesion side on reaching kinematics of the paretic UL in unimanual condition. These inter-group differences disappeared after 5 weeks of standard therapy, likely indicating a time lag in motor recovery.

Discussion Because the RHD patients were less prematurely coordinated again during bimanual movements than the LHD patients, they may benefit differently from a bimanual rehabilitation, and especially from the simultaneous involvement of the ipsilesional UL. It becomes necessary to investigate to what extent this difference due to lesion side may be integrated into the design of rehabilitation protocols.

Keywords Between-hands coordination; Hemispheric lateralization; Stroke recovery; Reach-to-grasp; Kinematics

Disclosure of interest The authors have not supplied their declaration of conflict of interest.

<http://dx.doi.org/10.1016/j.rehab.2015.07.029>