

Advanced assessment/practice and managing complex patients

PO1-CS-023

INFLUENCE OF LONG-TERM IMMOBILIZATION OF THE WRIST ON MOTOR IMAGERY ABILITY.

B. Bernard^{1,2,*}, M. Foidart-Dessalle^{1,2}, A. Mounier-Poulat², M. Varlet², C. Demoulin^{1,2}, S. Grosdent^{1,2}, J.-M. Crielaard^{1,2}, B. Forthomme^{1,2}

¹Department of Physical Medicine and Rehabilitation, Liège University Hospital Center, ²Department of Sport and Rehabilitation Sciences, University of Liège, Liège, Belgium

Background: Immobilization is known to cause a cortical reorganization. The proprioceptive deafferentation resulting from limb's disuse impairs the cognitive representation, the articular mobility, but also the quality, the speed and the coordination of movements. Although mental practice with motor imagery (MI) has been suggested to maintain and improve the cognitive representation of a limb, little is known regarding the impact of immobilization on motor imagery capacity

Purpose: This study aims to investigate the effect of a long-term immobilization of the wrist on MI ability assessed by means of several tests

Methods: 15 patients with wrist's trauma requiring at least of 4 weeks of immobilization, recruited in the emergency department of the Liège University Hospital Center (Belgium), were included in the present study. They attended 2 assessment sessions, i.e. within 24 hours after the trauma (pre-test) and when the cast was removed (post-test). During each session, 3 tests were performed in a random order : the french version of the Movement Imagery Questionnaire-revised Second version (MIQ-RS) which assesses the internally representation of movements by means of a visual (IMV) and kinesthetic (IMK) component, the Hand Laterality Judgment task (HLJT) during which the response time and the success rate were recorded and a mental chronometry test consisting of comparing the time needed to imagine and perform 8 different simple or complex tasks with wrist or fingers repeated 5 times. During the pre-test, the tasks were only performed on the healthy side while during the post-test they were executed on the 2 sides.

Results: Although the IMK score decreased and the IMV score increased after the immobilization period, the changes were not statistically significant ($p>0,30$). As a result, the overall MIQ-RS score did not significantly changed ($p=0,58$). Regarding the HLJT, the response time was significantly reduced after immobilization ($p=0,0003$) (but it might result from the training effect already reported for that test) whereas the success rate remained stable ($p>0,05$). The MC score related did not change regarding the healthy side ($p>0,05$) and the post-test MC score comparison between healthy and pathological sides shows no significant variation excepted for 2 out of 8 tasks ($p_{wst}=0,009$ and $p_{fct}=0,01$). This difference can be explained by the imagination's time which is conserved after immobilization and which is similar at the healthy side while the completion's time is increased in comparison of non-pathological hand, giving a negative MC pathological side.

Conclusion: The motor imagery ability doesn't change after a wrist's immobilization of more than 4 weeks.

Implications: Mental chronometry on traumatic side is not a suitable test to assess the MI ability after wrist's immobilization. Mental practice can be used immediately during and after this immobilization

Funding Acknowledgements: No funds have been perceived for this study.

Ethics Approval: All participants were informed of the objective of the project and took part in the study after informed consent had been obtained.

Disclosure of Interest: None Declared

Keywords: hand laterality, long-term immobilization, motor imagery ability