

**Research Report Poster Display****Number: RR-PO-209-4-Wed Wednesday 22 June 13:00****RAI: Exhibit Halls 2 & 3****ACTIVATION TIMINGS OF THE SCAPULAR STABILIZERS IN SUBJECTS WITH A STROKE AFFECTING THE RIGHT *VERSUS* LEFT HEMISPHERES**Ferreira S.<sup>1</sup>, Silva C.<sup>1</sup>, Silva A.<sup>1</sup>, Carvalho P.<sup>1</sup>, Santos R.<sup>2</sup><sup>1</sup>*School of Allied Health Sciences of Oporto (Escola Superior de Tecnologia da Saúde do Porto), Physical Therapy Department, Oporto, Portugal,* <sup>2</sup>*School of Allied Health Sciences of Oporto (Escola Superior de Tecnologia da Saúde do Porto), Physics Department, Oporto, Portugal*

**Purpose:** Lesions affecting the right hemisphere influence the ability to plan the virtual reaching trajectory and, consequently, the postural control. On the other hand, left hemisphere lesions affect the ability to select the adequate motor program to reach the target. This study aimed to explore the existence of differences at the activation timings and sequence of activation of the scapular stabilizers, mainly the serratus anterior, superior, middle and inferior trapezius fibers, in relation to the anterior deltoid, in subjects with a stroke affecting the right *versus* left hemispheres, during reaching. Besides, it aimed to establish comparisons between both sides of each subject and a group of subjects without pathology.

**Relevance:** This data will allow the inference of the neuronal activation patterns according to the activation timings of the referred muscles.

**Participants:** The sample ( $n=17$ ) consisted of voluntary subjects, selected by a questionnaire, and was divided in 2 Groups: Group 1 consisting of subjects without pathology ( $n=10$ ), and Group 2 constituted by subjects with a stroke ( $n=7$ ), with lesions affecting the right ( $n=4$ ) and left ( $n=3$ ) hemispheres. All subjects gave their informed consent according to the Declaration of Helsinki.

**Methods:** Electromyographic analysis was performed during reaching of a glass placed ipsilaterally to the upper limb in study, in the seated postural set, at the subject's maximal voluntary velocity; both upper limbs were assessed separately.

**Analysis:** A temporal analysis of the electromyographic data was performed off-line with the Acqknowledge 3.9.0. It was considered that an anticipatory postural adjustment preceded the movement by 100 milliseconds and lasted till 50 milliseconds after the onset of the electromyographic activity of the anterior deltoid. Because of the small sample size and non-normal distribution of the data, non-parametric statistical tests were used (SPSS Statistics 17.0). Descriptive statistics was used to describe the activation timings of Groups 1 and 2 subjects. Besides, the Wilcoxon test was used to compare the activation timings between the two sides of each subject. On the other hand, the Mann-Whitney test was performed to compare the activation timings between Groups

1 and 2 subjects. Differences with a  $p < 0.05$  were considered statistically significant.

**Results:** Differences were found at the activation timings of the left inferior trapezius fibers and serratus anterior bilaterally between the 2 groups studied ( $p=0.043$  and  $p=0.028$ , respectively). No differences were found at the activation timings between the two sides of each subject. The activation timings and sequence of activation were different according to the affected hemisphere.

**Conclusions:** Differences were found at the activation timings and sequence of activation of the referred muscles between the subjects with a stroke affecting the right and left hemispheres. This study presents a reduced sample and external validity, as well as, absence of participants and observers' blindness. Future studies may verify the effect of the weight distribution at the activation timings and sequence of activation, considering the affected hemisphere.

**Implications:** The study of the muscular patterns of the scapular stabilizers post-stroke will contribute to a more accurate intervention.

**Keywords:** Activation timings; Stroke; Cerebral hemisphere

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**Ethics approval:** This study considered the ethical rules implemented at School of Allied Health Sciences of the Oporto Polytechnic Institute.

**Research Report Poster Display****Number: RR-PO-305-17-Thu Thursday 23 June 12:00****RAI: Exhibit Halls 2 & 3****FUNCTIONAL EFFECTS OF PERIPHERAL COOLING IN MS PATIENTS WITH INTENTION TREMOR**Feys P.<sup>1,2</sup>, Nuyens L.<sup>3</sup>, Duportail M.<sup>3</sup>, Ilsbroux S.<sup>3</sup>, Truyens V.<sup>4</sup>, Van Asch P.<sup>5</sup>, Helsen W.<sup>6</sup><sup>1</sup>*Hasselt University/PHL, BIOMED/REVAL, Hasselt, Belgium,* <sup>2</sup>*Katholieke Universiteit Leuven, Biomedical Kinesiology & Rehabilitation Sciences, Leuven, Belgium,* <sup>3</sup>*National MS Center, Melsbroek, Belgium,* <sup>4</sup>*Rehabilitation and MS Centre, Overpelt, Belgium,* <sup>5</sup>*Fitness and Physiotherapy Center, Kontich, Belgium,* <sup>6</sup>*Katholieke Universiteit Leuven, Biomedical Kinesiology, Leuven, Belgium*

**Purpose:** To investigate the effects of upper limb cooling on tremor severity and functional performance in MS patients with intention tremor.

**Relevance:** Upper limb intention tremor in MS affects a patient's ability to perform activities of daily life and is extremely difficult to treat.

**Participants:** Persons with intention tremor in the arm due to MS were included.

**Methods:** In experiment 1, 17 subjects performed three different conditions were distinguished: two cooling con-