

MOTOR RESONANCE MECHANISMS: A STUDY BY FNIRS IN FIBROMYALGIA PATIENTS AND HEALTHY SUBJECTS

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Background. Scientific evidence indicates a link between motor and social cognition. The observation of an action elicits a motor cortex activity that is similar when the person executes the same action; this complex mechanism is named Motor Resonance (MR). The direct and non-inferential character of this process seems to represent a significant contribution to understanding other's actions in humans. The motor cortical activation can improve chronic pain conditions, like fibromyalgia (FM).

Aims. The main goal of this work was to explore the MR mechanisms in FM patients compared to healthy subjects.

Materials and Method. 22 FM patients (age= 50.45 \pm 10.67 years) and 20 controls (age= 46.30 \pm 11.48 years) were instructed to observe videos in which they could see a hand grasping a flat object or a sharp-tip object. In a defined experimental session of execution, subjects were asked to click a button as soon as the hand touched the object to be grasped. In a second experimental session (observation), subjects were only required to observe the grasping videos. The order of experimental sessions was randomized.

Results. The paired-sample t-test performed on reaction times (RTs) showed that for both groups RTs were delayed when the shown movement was not suitable to grasp the object (i.e., the sharp-tip object), revealing the presence of MR. The MANOVA analysis was performed for fNIRS data collected during observation and execution tasks. Results showed a significant group x condition interaction ($p=.029$). In particular, the activation in the observation condition was greater in patients than in controls. During the execution condition, the activation was the same in the two groups. These results are independent of the type of action observed.

Discussion. The results of the behavioural task indicated that both groups show the presence of MR. The analysis on fNIRS data suggests that the cortical activation determined by action observation is greater in patients than in controls. Therefore, the increase of MR mechanism in FM patients could be a compensatory phenomenon to pain-related motor impairment. Motor rehabilitation protocols based on action observation could be effective in improving chronic pain in FM patients.