Effect of observation of simple hand movement on brain activations in patients with unilateral cerebral palsy: an fMRI study

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Dinomais, Mickaël [1], Lignon, Grégoire [2], Chinier, E. [3], Richard, Isabelle [4], Ter Minassian, Aram [5], Nguyen The Tich, Sylvie [6]

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Résumé en anglais
The aim of this functional magnetic resonance imaging (fMRI) study was to examine and compare brain activation in patients with unilateral cerebral palsy (CP) during observation of simple hand movement performed by the paretic and nonparetic hand. Nineteen patients with clinical unilateral CP (14 male, mean age 14 years, 7–21 years) participated in the study. Hand motor impairment was assessed using the sequential finger opposition task. Using fMRI block design, brain activation was examined following observation at rest of a simple opening-closing hand movement, performed by either the left or right hand of an actor. Eighteen fMRI dataset were analyzed. Observing hand movement produced large bilateral activations in temporo-parieto-fronto-occipital network, comprising most of the nodes of the well described action-observation network. For either side, observing hand movements recruits the primary motor cortex (M1), contralateral to the viewed hand, as would be expected in healthy persons. Viewing movement performed by an actor's hand representing the paretic side of patients activated more strongly ipsilesional M1 than viewing movement performed by an actor's hand representing the nonparetic side of patients. Observation of hand movement in patients with CP engaged the motor execution network regardless of the degree of motor impairment.

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