Effect of motor imagery in children with unilateral cerebral palsy: fMRI study

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Résumé en anglais	Background Motor imagery is considered as a promising therapeutic tool for rehabilitation of motor planning problems in patients with cerebral palsy. However motor planning problems may lead to poor motor imagery ability. Aim The aim of this functional magnetic resonance imaging study was to examine and compare brain activation following motor imagery tasks in patients with hemiplegic cerebral palsy with left or right early brain lesions. We tested also the influence of the side of imagined hand movement. Method Twenty patients with clinical hemiplegic cerebral palsy (sixteen males, mean age 12 years and 10 months, aged 6 years 10 months to 20 years 10 months) participated in this study. Using block design, brain activations following motor imagery of a simple opening-closing hand movement performed by either the paretic or nonparetic hand was examined. Results During motor imagery tasks, patients with early right brain damages activated bilateral fronto-parietal network that comprise most of the nodes of the network well described in healthy subjects. Inversely, in patients with left early brain lesion brain activation following motor imagery tasks was reduced, compared to patients with right brain lesions. We found also a weak influence of the side of imagined hand movement. Conclusion Decreased activations following motor imagery in patients with right unilateral cerebral palsy highlight the dominance of the left hemisphere during motor imagery tasks. This study gives neuronal substrate to propose motor imagery tasks in unilateral cerebral palsy rehabilitation at least for patients with right brain lesions.
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