
Alteration of executive control is associated with greater mirror movements in healthy and brain-injured adults.

Résumé

Introduction : Mirror movements (MM) refer to the involuntary contractions occurring in homologous muscles contralateral to the voluntary movements, particularly in the distal upper limb muscles. It has been found that brain-injured patients present exacerbated MM. Attentional and inhibitory processes have been proposed as a key factor to explain the level of MM. However, the link between MM and attentional / inhibitory processes has never been formally tested. The present study aims to test this link in 24 right-handed healthy adults and 8 chronic brain-injured patients.

Method : We investigated the link between the amount / intensity of MM and attentional / inhibitory functions. For each participant, MM produced on each limb were assessed during two tasks (Maximal Voluntary Contraction and switching motor task) and the attentional and inhibitory functions were assessed with six neuropsychological tests.

Results : Our results showed that, (1) in all participants, whatever the nature of the task evaluating MM, the amount and intensity of MM was predicted by the level of executive control, assessed by the Trail Making Test. High executive control abilities was associated with less MM. Moreover, we found (2) a greater amount and intensity of MM and (3) a selective deficit in sustained attention in brain-injured patients compared to healthy adults.

Discussion : The present study is the first to highlight the link between the production of MM and executive functioning, leading to possible implications in terms of rehabilitation in brain-injured patients.

Mots-Clés: divided attention, stroke, neuropsychological assessment, switching, MVC, EMG