Immediate effects of mirror therapy on spatial neglect

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Objectives.— A few studies have suggested an effect of mirror therapy on hemiparesis after stroke (CVA) [1]. Recent work has also suggested a long-term effect on spatial neglect [2]. Our objective was to evaluate the immediate effect of a single session of mirror therapy on manifestations of spatial neglect.

Patients and methods.— We included eight subjects (30-75 years) with spatial neglect (according to Negligence Evaluation Battery) secondary to a unilateral stroke of the right hemisphere. Mirror therapy sessions lasted for 30 minutes and used the classic mirror therapy device [1] with a cache on the right upper limb. Control therapy used the same device and reproduced the visual anchor to the left space for the same duration. However, the image of the right arm was replaced by landscape images. The effect of the two procedures was compared in a randomized cross-over protocol with a wash out period of one week. Patients were evaluated blindly, before and after each session, by a line bisection test and a cancellation test. Statistical analysis used the nonparametric Wilcoxon test with an alpha risk of p = 0.05.

Results.— Mirror therapy induced a significant improvement in line bisection and visual detection targets. No significant difference was observed between the effects of the two therapies. Behavioral and fMRI data were collected.

Discussion.— Mirror therapy is applicable to subjects with spatial neglect under certain conditions. Immediate efficiency seems to be present but only partially. This result supports the hypothesis of an effect of mirror therapy on spatial neglect [2]. The effect appears to be independent of the attentional component. The induced effect may result from right hemisphere activation in relation to the visual illusion of upper left limb movement.

References

Study of pop-out effect in neglect patients

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Background.— Hemineglect is a syndrome characterized by disturbances of space exploration to the left hemifield with behavior of deviation to the right. Due to the diversity of its manifestations and brain lesion responsible for symptoms, pathophysiology, diagnostic and therapeutic still remain problematic. We have implemented on a computer interface the bells cancellation test (Gauthier 1989).

Objectives.— Establish the effects of striking targets (global or predominantly on the left) with color and/or movement on visual exploration according to each hemifield. Three groups of patients with brain damage are evaluated: 24 patients with hemineglicence, 12 patients recovered completely from it and 12 patients who never presented hemineglect.

Results.— Computerization of the test could be considered valid as there was a significant difference between the three groups for the number of targets hits, the first column of the target and the execution speed (p < 0.001 for all three). Our study has highlighted that the execution speed of hemineglect patients is improved by the introduction of a global striking effects by color (1.8 seconds after effect directed toward the left side associated to significant improvement of neglect and significant modification of LI for objects in the virtual reality task after PA. Moreover, a significant improvement of the drawing from memory of virtual supermarket plan is observed, suggesting an enhancement of the visuo-graphic, topographic and semantic aspects of spatial representation after PA.

Further reading

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between two targets versus 3.8 seconds between two targets, \( P < 0.001 \) or by motion (3.2 seconds versus 3.9, \( P < 0.001 \)). Moreover, the introduction of a left lateralized pop-out effect improves speed of execution in left hemifield, and therefore surpasses the spatial bias law. The pop-out effect persists among hemineglect patients in the right as well in the left hemifield.

Since the pop-out effect allows hemineglect patients to surpass their spatial exploration bias, we suggest that rehabilitation exercises via this computerized form, could help patients to manage their disorder. 

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