

(VAP-S) and to catch eight objects located on the right or left sides. For this task, two parameters were measured: a lateralization index (LI) of the objects taking, and the drawing from memory of the supermarket plan. For each patient, experimental procedure included two pre-tests, ten PA sessions during 2 weeks, and four post-tests immediately, 3, 7 and 30 days after PA.

The results show a significant 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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Immediate effects of mirror therapy on spatial neglect

A. Moustapha^{a,*}, M. Rousseaux^b

^aService de rééducation fonctionnelle, clinique Saint-Roch, 56, rue de Lille, 59223 Roncq, France

^bService de rééducation neurologique, hôpital Swynghedaw, CHU de Lille, Lille, France

*Corresponding author.

E-mail address: moustapha3ali@yahoo.fr.

Keywords: Mirror therapy; Spatial neglect; Stroke

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 test ($p = 0.025$) but not in cancellation test. Control therapy had no effect on performance in any test. However, no significant difference was observed between the effects of two therapies.

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

[1] Altschuler EL, et al. Rehabilitation of hemiparesis after stroke with a mirror. *Lancet* 1999.

[2] Dohle C, et al. Mirror therapy promotes recovery from severe hemiparesis: a randomized controlled trial. *Neurorehabil Neural Repair* 2009.

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Hemineglect evaluation using a spatial visuo-auditory task

S. Scannella^{a,*}, J. Pariente^b, J.A. Lotteric^c, X. De Boissezon^c, P. Marque^c, M. Simonetta-Moreau^b, E. Castel-Lacanal^c, J. Pastor^a

^aInserm UMRS 825, université de Toulouse UPS, CHU Purpan, pavillon Baudot, 31024 Toulouse, France

^bInserm UMRS 825, CHU Purpan, France

^cInserm UMRS 825, CHU Rangueil, France

*Corresponding author.

E-mail address: sebastien.scannella@gmail.com.

Keywords: Hemineglect; Attention; Spatial visuo-auditory conflict

Objective.— Evaluate new robust clinical tests to detect visual and auditory spatial neglect in hemineglect patients who succeed in clinical visuo-motor exploratory tasks but fail in daily habits.

Material/Participants and methods.— Behavioral and fMRI data were collected during a visuo-auditory conflict task in 19 healthy adults and one hemineglect patient with right parietal lesion. An earplug system was used for auditory stimuli (1000 Hz pure tones). Adjustable coil-mounted goggles displayed the visual stimuli (filled white circles on a black background). In congruent trials, stimuli were presented simultaneously on the same side (left or right); they were presented on opposite sides in incongruent trials. Participants had to respond with their right hand by pressing a response-pad button corresponding to the auditory or visual target's side according to the instruction.

Results.— For the left target the patient needed more time than the control group to respond, regardless of the modality or the congruency. Nevertheless, the conflict cost was similar to the control group. For the right target, the patient presented an extensive conflict effect for auditory target and a paradoxical (reversed) conflict effect for visual target. fMRI data showed that, for the auditory target, incongruent compared to congruent trials elicited activations over a bilateral fronto-parietal network in the control group. A comparable result was obtained for the patient except for the right inferior parietal activation (BA40). Instead, we observed a right superior parietal activation (BA7). No activation was found for incongruent trials compared to congruent for the visual target whatever the group.

Discussion.— Unlike clinical visuo-motor tests, our spatial visuo-auditory conflict task revealed a left visual and auditory attentional deficit in the patient. fMRI activations suggest that he may have partially recovered from his hemineglect due to cortical plasticity after his stroke; this matched with the occurrence of a right conflict cost for auditory but not visual target.

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Study of pop-out effect in neglect patients

C. Terracol^{a,*}, C. Montaut^b, E. Castel-Lacanal^b, X. De Boissezon^b, C. Jouffrais^c, P. Marque^b

^aService de MPR, CHU Toulouse Rangueil, 1, avenue Jean-Poulhès, 31059 Toulouse, France

^bService de MPR, CHU Rangueil, France

^cIRIT, université Paul-Sabatier, Toulouse 3, France

*Corresponding author.

E-mail address: terracol.c@chu-toulouse.fr.

Keywords: Hemineglect; Computer test; Cancellation test; Saliency; Parietal lesion

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).

Objective.— 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 heminegligence, 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