

뇌신경재활

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

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Rehabilitation of Hemispatial Neglect with Field-of-Regard-focused Visual Exploration Therapy

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Background and aims

Although many patients experience significant recovery in the early phase after injury, hemispatial neglect (HSN) can persist for many years, and there is insufficient evidence to support the efficacy of available rehabilitation strategies. We previously proposed concept of field-of-view (FoV) and field-of-regard (FoR). In this study, we examined the efficacy of field-of-regard-focused visual exploration therapy (FORVT) implemented using a head-mounted display (HMD) virtual reality system for HSN rehabilitation following stroke.

Methods and materials

Five and six right handed patients with left HSN were randomly assigned to the training first (TF) or waiting first (WF) groups, respectively. During FORVT, the head-tracking feature of the HMD was activated. Participants were asked to detect a target over a spherical coordinate system as quickly as possible. The TF group completed 20 sessions of a FORVT program using an HMD followed by four weeks of waiting, while the WF group completed the opposite regimen. Participants underwent assessment at baseline, 4 weeks, and 8 weeks with HMD assessments (FoR and FoV measures) and clinical HSN assessments (LBT, SCT, and CBS). Dependent variables for the HMD assessment included response time (RT), success rate (SR), and head movement (HM) in FoR and FoV conditions. We conducted repeated measures analyses of variance (ANOVA) for FoR measures (FoR-RT, FoR-SR, and FoR-HM) with Type (FORVT vs. waiting) as a between-subjects factor and Time (pre vs. post) as a within-subject factor. Because all participants exhibited left HSN and underwent identical training for both space, responses from the right hemisphere were regarded as control values. We conducted a 2 × 2 ANOVA (pre/post-FORVT and left/right hemisphere) on FoR-RT, FoR-SR, and FoR-HM. Paired Samples t-tests and ANOVA were used to evaluate FoV measures (FoV-RT, FoV-SR) and the results of clinical HSN tests (LBT, SCT, and CBS) compared between the pre- and post-training periods to evaluate the efficacy of FORVT.

Results

There were no significant difference between-group differences in demographic features, clinical HSN assessments at baseline and effect of training order. ANOVA and post hoc

analyses revealed significant differences between the pre- and post-FORVT conditions in FoR-RT and FoR-SR (Table 1). In comparisons between left and right hemispheres, while there were significant differences between two FoR-SRs of both hemispheres in the pre-FORVT conditions but not in the post-FORVT conditions. The same results were observed in the FoR-HM, but not in the FoR-RT (Figure 1). Improvements in FoV speed and accuracy and classical assessment scores were also observed. Significant effects of FORVT were observed on FoV-RT, FoV-SR and CBS score while marginal effects were observed on LBT score and SCT score (Table 2)

Conclusion

The present study revealed the efficacy of FORVT for the rehabilitation of HSN following stroke.

Table 1. Effects of each intervention arm

		FoR-RT (s)	FoR-SR (%)	FoR-HM (°)
FORVT	Pre	4.99 ± 1.45	69.09 ± 16.09	8280.48 ± 2551.45
	Post	3.02 ± 1.09	91.31 ± 10.10	7050.96 ± 3154.98
Waiting	Pre	4.19 ± 1.56	78.28 ± 18.60	11550.78 ± 10500.48
	Post	4.16 ± 1.40	79.70 ± 16.60	9649.31 ± 6276.50

Table 2. Effects of FORVT on non-FoR measures

Measure	Before FORVT	After FORVT
FoV-RT (s)	2.04 ± 0.71	1.52 ± 0.69
FoV-SR (%)	73.03 ± 16.96	85.45 ± 14.53
LBT score	4.44 ± 2.82	6.26 ± 1.97
SCT score	47.36 ± 6.00	49.82 ± 5.38
CBS score	6.46 ± 4.82	4.82 ± 3.84

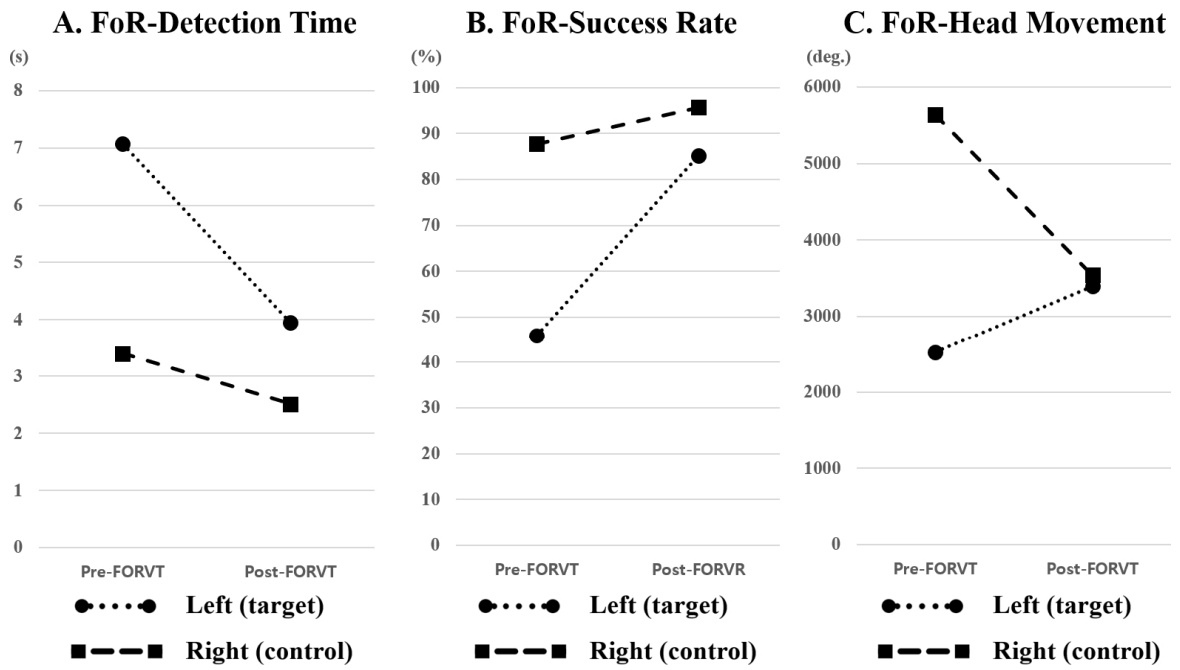


Figure 1. Training effects in each hemisphere. FoR, field-of-regard.