Keywords: Spatial neglect; White matter damage analysis

Unilateral spatial neglect frequently occurs after right-hemisphere stroke. It represents a major problem in the domain of public health, since it prevents patients from orienting or responding to left-sided stimuli. The exact anatomical location of lesions underlying the manifestation of this syndrome is currently debated (Bartolomeo, 2012). In the present study, we used a longitudinal approach in order to identify the lesional predictors of chronic neglect in long-range white matter bundles.

We present a longitudinal study of 37 patients with right-hemisphere damage, tested at the acute/subacute phase and at more than 1 year after the stroke. 27 patients presented signs of spatial neglect in the acute/subacute phase. Each patient underwent a radiological assessment including a DTI sequence, (50 directions; b-value of 1000 mm²/s). Voxelwise statistical analysis of the fractional anisotropy (FA) data was carried out using TBSS (Tract-Based Spatial Statistics, Smith, 2006).

The longitudinal follow-up revealed that only 10 patients (27%) recovered from neglect at restet. In acute/subacute neglect, a lower FA was found in the way of the right Superior Longitudinal fasciculus (SLF II and III) and of the corpus callosum. In the chronic phase, TBSS analysis showed the implication of the posterior portion of the corpus callosum (splenium) and of SLF II & III. The voxelwise correlation between a cancellation task (Bells test) and FA maps found a lower FA in the way of the anterior corpus callosum, local frontal and fronto-parietal white matter (SLF II and III), and in the thalamus.

Our results confirm a key role of fronto-parietal disconnection in the emergence and chronic persistence of neglect (Theibaud de Schotten et al., 2012). Moreover, we demonstrated an implication of interhemispheric disconnection (splenium and forceps major) in chronic neglect. These findings support the hypothesis that interhemispheric disconnection may deprive the right fronto-parietal pathway of visual inputs, amputing the brain reconstruction of the left hemi-space (Tomaiuolo et al., 2010), and that chronic neglect at least in part results from the activity of an isolated left hemisphere (Bartolomeo et al., 2007).

Results and conclusion—Consistent with the literature, the results showed a deficit in understanding figurative language in TBI. Correlations indicated that the understanding of the three types of figurative expressions were positively and significantly correlated with semantic and linguistic abilities (metaphors and idioms), and to determine the origin of these deficits (working memory, inhibition, semantic and linguistic abilities).

References

Keywords: Traumatic Brain Injury; Figurative Language; Metaphor; Idiom

Introduction.– Language deficits reported in patients with traumatic brain injury (TBI) mainly concern the understanding of figurative language [1]. The aim of our study was to demonstrate the difficulties of understanding in figurative language of patients with TBI, to specify them with various figures of speech (metaphors and idioms), and to determine the origin of these deficits (working memory, inhibition, semantic and linguistic abilities).

Patients and methods.– A group of 41 TBI patients was matched for sex, age and the educational level with a group of 41 respective controls (11 women, 30 men, mean age 32 years ±13, average educational level: 11 years of study ±3).

Participants filled a questionnaire composed of 48 comprehension expressions put into context: 16 verbal metaphors such as “Installed on the sunbed, Paul nibbled existence.”, 16 idioms such as ambiguous semantically transparent “Given the situation, Aline was forced to lay down their weapons.”, 16 not semantically transparent such as “Until the ship arrives, Elodie touched wood.” and 16 literal sentences (control items); and the verbal subtests of the WAIS-III for assessing semantic and language abilities, the Stroop test, the Hayling and Brixton tests for assessing executive functions.

Results and conclusion.– Consistent with the literature, the results showed a deficit in understanding figurative language in TBI. Correlations indicated that the understanding of the three types of figurative expressions were positively and significantly correlated with semantic and language abilities (VIC), with the working memory index (IMT) and with performances at executive functions' tests. Specifically in TBI patients, VIC was the significant predictor of metaphors and nondecomposable idioms understanding, while verbal inhibition abilities measured by the Hayling test, was the significant predictor of decomposable idiom understanding.

Reference

Keywords: Bilingualism and executive functions

Introduction.– Functional and structural aspects of language processing are also regulated by executive functions (EF), which are involved in the coordination of cognitive processes and the selection of the most effective response to a task, in order to achieve a goal. In TBI patients, EF are impaired and are often constant in multiple domains, such as working memory, inhibition, attention and motor sequences (Lasalmonie & Chein, 2001). EF also play a key role in the understanding of figurative language (Argyropoulos, 2007).

Patients and methods.– In this study, we compared the performance of TBI patients with those of healthy children and adults on several EF tasks. The performances were assessed using three tasks: a) verbal fluency, b) working memory, and c) shifting mental sets.

Results and conclusion.– The results showed that TBI patients performed worse than healthy children and adults on all EF tasks. The most impaired EF tasks were verbal fluency and working memory.

References

Keywords: Language; Perceptual system; Motor system; TMS

Introduction.– Recent studies have shown that speech perception involves the motor system of the lips and tongue [1], integrating the idea developed by Rizzolatti et al. [2] about the existence of mirror neurons in humans. This study aims to investigate the influence of the integration of the perceptual system on the motor system in integrating visual-auditory perception and speech.

References

Keywords: Language 2008;107:229–33.

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