Working memory (WM) and executive functions (EF) in aphasic patients

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Keywords: Aphasia; Working memory; Executive functions; Communication

Objective. – To assess WM and EF in aphasic patients with original non-verbal tasks, suitable for their expression and comprehension deficits. We explored the relationship between their WM/EF abilities and communication disorders.

Methods. – The scores of 33 aphasic patients in forward, backward digit span, forward visuospatial span, inhibition, flexibility, updating and fluency tasks were compared with those of 43 controls (Student’s t-tests). In patients, using Bravais–Pearson R, we assessed the relationship between the cognitive scores and the scores on questionnaires measuring the WM complaints [1], on the one hand and the communication disorders [2], on the other hand.

Results. – Analyses revealed lower scores for patients for all the WM and EF tasks (P from 0.014 to < 0.001). Patients had also significantly more complaints and communication disorders than controls. Scores on the communication disorder scale were correlated to those on the WM/EF tasks.

Discussion. – This study showed genuine deficits in aphasic patients in all the WM/EF domains. These deficits were observed beyond their language disorders and could contribute to their communication difficulties.

References
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Interactions between language and executive functions: Elaboration of new tests to assess the impact of executive functions on language comprehension

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Keywords: Executive functions; Brain damage; Comprehension.

Background. – Brain damaged patients may suffer language troubles attributable to cognitive functions different from aphasia. The aphasic tests don’t bring out these specific troubles.

Objective. – The aim of this study is to evaluate the sensibility in assessing the troubles in verbal comprehension for the proposed tests (Token Test and three new tests to assess Working Memory, Flexibility, Updating).

Methods. – We start a normalization of the tests on control population, and a validation on brain damaged patients, without aphasia. Each verbal task has a matched non-verbal test. For patients, we submit complementary tests: Sentence Comprehension (MT86) and DEX survey (therapist).

Results. – We submitted the tests to brain damaged patients. Results show the higher sensibility of the new tests (compared to the standard aphasic tests) in the assessment of the “executive” comprehension troubles.

Discussion. – The proposed tests allow to refine the assessment of comprehension troubles in brain damaged patients targeting at the altered function: Working Memory, Flexibility, Updating. They bring sensibility and relevance where the standard aphasic tests have limits.

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Comparison of the sensibility of language tests assessed to an aphasic patient with good recovery

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Keywords: Aphasia; Executive function; Assessment

Objective. – Brain damaged patients may suffer language troubles attributable to cognitive functions different from aphasia. The aphasic tests do not bring out these specific troubles.

Methods. – Mrs L., 56-years-old, had a left ischemic cerebrovascular accident, on March 2013, with hematoma of the left internal capsule. Initially, she had a non-fluent aphasia, which clinically recovered well. The language assessment (MT86) submitted 8 months later does not bring out anymore any kind of trouble. We compared those results to executive language tasks: Dice Game, Hayling Tests, and fluencies “Animals” and “words in P”. We also submitted executive non-verbal tasks.

Results. – The results bring out a higher sensibility of the executive language tests, especially for the Dice Game.

Discussion. – Considering this case study, aphasic tests do not allow to bring out specific language difficulties which appear in executive language tasks. Thus they may be related by nature to executive and phasic functions. The executive non-verbal tests confirm this hypothesis.

Conclusion. – The limits of aphasic tests look evident in this case of good recovery after aphasia. Language difficulties related to executive troubles have to be assessed with specific tests.

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Multimodality and error reduction learning in anomia therapies

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Background. – Anomia therapies mainly use errorful learning whereas error reduction learning (ERL) is rarely described. We have created computer-assisted therapies to address anomia offering three distinct treatments for each lexical disorder using a multimodal procedure ERL.

Objective. – To determine efficacy of multimodal procedure ERL in anomia.

Methods. – A single-case design computer-assisted treatment was used in two aphasic subjects: a 63-year-old man (MF) with word-retrieval disorder and a 52-year-old woman (HA) with a lexico-phonological disorder. Each received appropriate therapy to their lexical disorder using a multimodal procedure ERL in three sessions, including intermediate assessments. The effects were tested for trained words, generalization to untrained words, maintenance and transfer of improvement to daily life.

Results. – Specific therapies of word retrieval (MF) and lexical-phonological disorder (HA) were significantly effective showing a generalization effect and maintenance of the improvement.

Conclusion. – This study demonstrates the effectiveness and the maintenance of improvements in both multimodal treatments using error reduction learning in anomia.

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Clinical course of cognitive disorders after cardiac arrest
Objective.– To describe the course of cognitive disorders after cerebral anoxia.

Methods.– Retrospective study of the neuropsychological assessments after cerebral anoxia; assessment were performed at the acute phase and several years afterwards; patients were included in the PMR department. Comprehensive neuropsychological assessment before and after cognitive rehabilitation.

Results.– Forty-nine patients had been assessed. Fifteen were seen several times, mean delay between the first and the last assessment was 2 years. The first assessment showed attentional, dysexecutive and memory disorders for more than 80% of patients. Memory disorders were due to a storage dysfunction in 40% of cases. Instrumental disorders were also present for 50% of patients. The second assessment indicated significant improvement in all cognitive functions for 87% patients, even if some deficits persisted.

Discussion.– Attentional and dysexecutive disorders were the most usual pattern of cognitive impairments. The second assessments pointed out important improvement. Spontaneous improvement could not explain on its own evolution after 2 years. In light of these developments, it seems important to include an MPR assessment in the medical follow up of these patients.

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Questionnaire survey of prolonged disorder of consciousness rehabilitation service provision

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Keywords: Consciousness; Assessment tools; Questionnaire; Stimulant medications

Objective.– To ascertain current service delivery for patients in a prolonged disorder of consciousness (PDOC) in the UK.

Methods.– A postal questionnaire was developed and piloted in Ireland. After revision for the UK, it was posted to 230 UK based consultant members of the British Society of Rehabilitation (BSRM).

Results.– Sixty responses (26%) were received: 36 units did not provide services for PDOC, but 28 did: 4 questionnaires excluded due to incomplete data, leaving n = 24. Thirteen (54%) had established admission criteria, but 20 (83%) had no formal care pathway. Thirteen (54%) units cared for 52 weeks. The most frequently used assessment tools were the WHIM 17 (71%); GCS 15 (62%); and SMART 11 (46%). Fourteen (58%) respondents routinely used medications to stimulate increased wakefulness, including Amantadine 10 (71%) and Zolpidem 9 (64%). Only 6 (26%) provided routine follow-up reviews for patients with PDOC.

Discussion.– This first large-scale UK survey of current practice for PDOC patients is thought likely to represent most units in the UK that deliver a PDOC service. Service consistency may be better achieved through the establishment of a network specialising in PDOC, with a uniform approach to assessment, management and follow-up care.

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Rehabilitation of hemispatial neglect. Utility to combine prism-adaptation and methylphenidate. RITAPRISM study

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Keywords: Stroke; Hemispatial neglect; Prism adaptation; Methylphenidate

Background.– Hemineglect can interfere with rehabilitation processes and lead to poor functional outcome in right-brain-damaged patients. Several studies have shown that prism adaptation (PA) to right lateral displacement of the visual field improves hemineglect but the optimal procedure of PA therapy remains to be validated.

Discussion.– A monocenter, double-blind, randomized, controlled trial was conducted to evaluate the effects of a once-weekly regime of PA on disability due to neglect, as evaluated with straight ahead pointing, neuropsychological tests and the Functional Independence Measure (main outcome measure).

Methods.– A total of 20 right-brain-damaged neglect patients were divided into prism (n = 10) and control (n = 10) groups. The prism group performed repetitive pointing with prism glasses twice daily, 1 day per week, for 4 weeks, whereas the control group performed similar pointing training with neutral glasses.

Results.– Results showed a significant reduction of the straight-ahead pointing bias in the prism group, and a significant reduction of neglect and disability in both groups, without difference between them.

Discussion.– These results suggest that the pointing training itself is efficient to create cognitive effects and disability reduction and that a once-weekly regime of PA does not provide an additional benefit.

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A once-weekly regime of prism adaptation reduces only sensori-motor biases of neglect.

A double-blind RCT essay

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Keywords: Hemineglect; Rehabilitation; Prism adaptation; RCT

Background.– Hemineglect can interfere with rehabilitation processes and lead to poor functional outcome in right-brain-damaged patients. Several studies have shown that prism adaptation (PA) to right lateral displacement of the visual field improves hemineglect but the optimal procedure of PA therapy remains to be validated.

Discussion.– Results suggest that there is an advantage to combine treatments directed to non-spatially lateralized attention and spatially lateralized cognitive functions in hemineglect patients.

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