Discussion and conclusion.– In view of the first results, the properties of the French version of the RASB appear promising in terms of easiness to handle, sensitivity, reproducibility and internal consistency. Further research is necessary on the concurrent validity in order to obtain a complete validation of the tool.


CO02-006-EN
Calculation and number processing troubles in patients with traumatic brain injury
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Keywords: Traumatic Brain Injury; Ecological assessment; Calculation; Number processing

Cognitive impairment is a common and prominent sequela of traumatic brain injury (TBI). Number processing and mental arithmetic require the intervention of multiple cognitive functions. These abilities may be altered, thereby compromising patient autonomy. However, these disorders are rarely evaluated. Validated tests often lack sensitivity unsuited for these patients.

Aim.– The aim of our study is to assess number processing and calculation in patients with TBI and their impact on daily activities.

Materials and methods.– Using a numerical processing battery (BENQ), we assessed the long-term effects of severe or moderate TBI in patients who returned home. BENQ is a standardized ecological scale, which includes 11 tasks corresponding to manipulation of numbers in situations similar to those of everyday life: telling time, estimating prices and making change. The results are compared with an analytic battery: EC301 and an estimation task extracted from TLC2.

Results.– We included 8 patients aged from 29 to 57 years old (mean 44 years old). The average total score on the BENQ is 35.87 on 41 (SD = 2.85). Three subjects obtained a pathological score in both the BENQ and the estimation task of TLC2. The patient who had the lowest score at the BENQ also obtained the lowest score in the EC301. Specific difficulties in estimation and problem resolving emerged from the evaluation.

Discussion.– We have highlighted in ecological situations calculation and number processing deficits in patients with traumatic brain injury. The BENQ is therefore a good assessment tool in patients with TBI. Thus, deficits can be objectively and appropriately rehabilitated. Based on our study, this test is currently being revised in order to improve its psychometric qualities.


CO02-007-EN
Neuropsychological evaluation of the abilities necessary to return to drive after a brain damage
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Keywords: Ability to drive; Brain damage; Neuropsychological evaluation

Objective.– The purpose of this work was to pre-test a neuropsychological assessment, evaluating the abilities necessary to return to driving after brain damage. Physical medicine and rehabilitation teams are regularly confronted with this problematic. We know that a pluridisciplinary assessment (physician, neuropsychologist, work therapy specialist, driving school teacher) is necessary. However, an important amount of research remains to be done in order to establish a harmonious set of tests and to help make changes to current regulations.

Material/Patients and method.– Based on the cognitive model of driving of Michon and on the works of C. Fattal since 1994, we elaborated a neuropsychological series of tests assessing various cognitive functions necessary to drive: attention, executive and visuospatial disorders. This protocol was conducted with a group of 89 patients with brain damage (brain injury, stroke, tumor...). Then, subjects were assessed by an approved driving school teacher during five sessions, especially trained for this type of pathology and after that the patients were divided into two groups: “able to resume driving” or “unable to resume driving”.

Results.– On the whole, all the participants were under the normative average for most of tests. But the differences in performance between the two groups were statistically significant. Moreover, from the 70th patient included and onward, and although the pre-necessary statistical requisites were not entirely respected (effective of the “inapt” group too small) we used the double-blind method and predicted the aptitude or the inaptitude of each patient: this prediction appeared in conformity with the conclusion of the driving teacher for the last 20 patients.

Discussion.– Our results authorize us to think that it is possible to predict the capacity or incapacity of resuming driving after brain damage and thus by using specifically selected tests associated with an ecological assessment.


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Conscious behavior after traumatic brain injury: Anatomo-functional support and therapeutic prospects
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Keywords: Coma; Consciousness; Tegmentum; Thalamus; Basal ganglia; Default-mode network; Precuneus

Objective.– Most brain-injured patients with severe and chronic consciousness disorders are in a therapeutic deadlock. This concerns mainly vegetative or neurovegetative patients, and patients in minimally conscious state. Chronic coma is an exceptional condition; certain conditions of akinetic mutism, which are more frequent, can be included in severe and chronic consciousness disorders. The goal is to review the functional connectivity of conscious behaviours and relational arousal, in particular since the introduction of modern clinical imagery.

Description.– The connectivity described in this work relies mainly on two magnetic resonance imaging structural studies of the deep brain: a high-resolution atlas (voxel = 250 μm side; 4.7–Tesla) of an human anatomic piece; an extensive study of deep fascicles (diffusion tensor imaging and tractography; voxel = 1.25 × 1.25 × 1.5 mm3; 3–Tesla) on 6 healthy subjects. The results show the support of the functional connectivity of consciousness that involves the mesencephalo-pontine tegmentum, the basal ganglia, the hypothalamus and the thalamus. These deep located regions are connected with the cortex through three main paths: thalamic, ganglonic and rostroventral. The thalamic path rises from the tegmentum, uses the central tegmental tract, and reaches the reticular and dorsomedial thalamus; from the thalamus it spreads to the cortex, the limbic system, the striatum and the pallidum. The ganglonic path uses the lenticular