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Neural mechanism of the spatial orienting in the posterior parietal cortex in live mouse: Two-photon brain imaging study

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Keywords: Two-photon microscope; Lesion; Posterior parietal cortex; Spatial orienting; Morris water maze

Objective.– The aim of this study was to demonstrate the crucial role of right posterior parietal cortex in spatial orienting using two-photon microscope detecting cortical neuronal activity and Morris water maze testing visuospatial function.

Methods.– Eighteen C57BL/6 J mice were randomly divided into two groups as damaged group that received electrolytic lesion of right posterior parietal cortex and normal control group that received no operation. Morris water maze was performed to test visuospatial orienting function. And then, depose the mouse under two-photon to observe and record.

Results.– Under the two-photon calcium imaging, damaged mice in the posterior parietal cortex showed significant deficits on the recorded neurons compared with normal control group. Moreover, the lesion in the posterior parietal cortex resulted in significant decrease in the number of both the neuron cell and the neurogliocytes. During the Morris water maze test, damaged mice showed significant deficits in the spatial orienting compared with normal control group.

Conclusions.– Two-photon microscope can detect online neuronal activity, with high temporal and spatial resolution. Posterior parietal cortex plays a crucial role in spatial cognition.

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Changes of cerebral glucose metabolism in patients with minimally conscious state after hypoxic-ischemic brain injury

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Keywords: Cerebral glucose metabolism; Minimally conscious state; Hypoxic-ischemic brain injury

Background.– Hypoxic-ischemic brain injury (HIBI) is one of the most devastating adult neurological diseases causing the disorder of consciousness (DOC). In clinics, most patients suffered from the vegetative state (VS) or minimally conscious state (MCS).

Objective.– To assess the altered brain metabolism in DOC after HIBI, which can predict the neurological recovery.

Methods.– Thirty patients with VS, 20 patients with MCS after HIBI were recruited. In VS and MCS patients, mean age was 43.5 and 44.1 years, mean JFK-CRS score was 5.4 and 11.7, respectively. We measured the brain glucose metabolism in both groups and compared the brain metabolism using SPM2.

Results.– The brain metabolism in right superior occipital gyrus, both superior parietal gyrus, both precentral gyrus, both postcentral gyrus was significantly increased in the MCS compared to the VS patients. However, there was no brain area that was decreased of brain metabolism in MCS compared to VS patients.

Discussion.– Our findings suggested that spared brain metabolism in the primary motor-sensory and visual cortices is relevant for meaningful response to environmental stimulation in MCS patients. A better understanding of the altered brain metabolism will contribute to optimizing therapeutic intervention for the recovery of DOC after HIBI.

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Driving and cognitive disorders

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Keywords: Cognitive disorders; Driving simulator; Comète-France; Neuropsychological; Driving licence

Objective.– Acquired and stabilized brain injuries are responsible for difficult to diagnose cognitive impairment and may compromise the resumption of driving.

Methods.– Their detection requires a careful medical evaluation completed by a robust neuropsychological assessment. As part of a multi disciplinary care of stroke patients in specialized rehabilitation, facility dedicated team, built around “Comète France” implements a specific support to enable them to resume driving in an appropriate way.

A protocol is established: medical assessment, physiotherapy and occupational therapy assessment, psychological and neuropsychological assessment, testing and rehabilitation and re-entrainment on driving simulator with the type “VTS Vienna Test System and Cogniplus”, finally test station auto driving school software adapted road. Accompanying administrative steps to regularize the Licence and if possible to obtain spatial vehicle subsidies.

Results.– Many brain injury patients were able to restart driving and thus regain their independence.

Discussion.– These findings underline the difficulty of establishing sufficient security level for each patient.

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Repetitive transcranial magnetic stimulation in the left hemisphere on a patient aphasic

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Keywords: rTMS; Aphasia; Stroke

Objective.– The rTMS, in addition to aphasia rehabilitation, is usually suggested at a 1 Hz rate (inhibitor stimulation) on the right side, to enable ipsilesional recovery. This location of stimulation could be discussed for some patients having developed language skills in contralesional.

Methods.– Mr S., 45 years old, victim of a cerebrovascular accident of the left hemisphere in 2009, suffered from mixed aphasia predominating on the expressive side. The language assessment based on oral expression is divided in 4 equal parts, as to define the best stimulation zone: each one is submitted on 4 different days, before and after a rTMS session. The stimulation locations are the following: left and right pars triangularis and left and right pars opercularis.

Results.– Improvement being more important after stimulation of the left pars opercularis, 10 rTMS sessions of 20 minutes were done on that zone, followed by 30 minutes of speech therapy.

In total, improvement in denotation: 2/20 versus 7/20 in the final test.

Discussion.– These findings support the interest of clinical or functional imaging analysis to determine the best stimulation location for rTMS for each patient.

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Visual agnosia related to hypoxic ischemic encephalopathy: A case report

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Keywords: Visual agnosia; Hypoxic-ischemic encephalopathy; Case report

Objective.– The aim of the case report is to present a patient with visual agnosia related to hypoxic-ischemic encephalopathy.

Methods.– A 1-month-old baby girl born 35 weeks gestation by cesarean section for breech presentation, and with meconium aspiration syndrome was transferred to our hospital on postnatal day 3, suffering from severe hypoxic ischemic encephalopathy.

Results.– A 1-month-old baby girl with visual agnosia related to hypoxic ischemic encephalopathy was admitted to our hospital. Visual agnosia was defined as the patient’s failure to recognize objects she could not visually inspect.

Discussion.– The case report demonstrates that visual agnosia can be a complication of hypoxic ischemic encephalopathy.

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Implicit recovery of autobiographical memory in patients with neurological global amnesia: A study with the autobiographical Implicit Association Test

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Keywords: Amnesia; Autobiographical memory; Implicit memory; Neuropsychological assessment; Traumatic brain injury

Background.– Several studies have shown that patients suffering from global amnesia are able to learn new information through mechanisms of implicit learning, and to recall them implicitly (e.g. through procedural memory; Squire and Shragon, 2008).

Objective.– The purpose of this study was to verify, using the autobiographical Implicit Association Test (aIAT, Sartori et al., 2008), whether these patients have maintained an implicit memory trace of the erased autobiographical events, even though they could not remember them at conscious level.

Methods.– Six patients suffering from global amnesia after brain damage were tested. Each patient was administered four aIATs on four different life events that were not remembered at the explicit level.

Results.– Results showed that the aIAT could, in some cases, identify the real event, indicating that the patients’ memory traces of events were not completely destroyed. We have shown that aIAT can be used as a method of memory-detection to identify whether the patients have or have not retained an implicit memory trace.

Discussion.– To date no study in literature showed the possibility of detecting the presence of implicit autobiographical memories in this patients. The implicit traces preserved could potentially become a starting point to work in memory rehabilitation.

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Contribution of constraint in communication therapy for persons with non-fluent chronic aphasia

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Keywords: Aphasia; Communication; Therapy; Constraint

Objective.– To assess the contribution of “constraint” in the communication therapy in persons with non-fluent chronic aphasia.

Methods.– We propose a comparative study of seven patients, divided into two groups according to the same protocol of intensive rehabilitation. The control group may use any means of communication, the other is “forced” to use only the verbal channel. We used both analytical and functional strategies to maximize linguistic and communicative aspects.

Results.– We do not find significant differences in post-therapy: although both groups improve their linguistic abilities. The evolution of communication scores is rather better to the “unconstrained” group.

Conclusion.– A more specific recruitment of patients would better target the constraint factor.

Further reading


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What is the impact of addictive behaviours and psychiatric disorders on treatment of burn care and rehabilitation following?

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Keywords: Addictive behaviour; Burn patients

Objective.– In clinical practice, the incidence of psychiatric disorders in burn patients admitted in rehabilitation unit seems far from negligible, sometimes impacting heavily rehabilitation.

Methods.– Retrospective from data coding epidemiological survey on the incidence of psychiatric disorders and addictive behaviours in a population of