

therefore believe it is important to highlight the following: even though it would be quite rare, a case of GBS that cannot be clearly linked to any of the processes or entities with which it is usually associated, which appears with abnormal laboratory results that are not typically seen in classic GBS, or which evolves at an alarming rate and responds poorly to conventional treatment should lead the doctor to consider the possibility of an underlying case of lymphoma.

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## Emotional memory: Synthesis of a study proposal<sup>☆</sup>

### La memoria emocional: síntesis de una propuesta de estudio

Dear Editor:

Affective responses are evolutionarily prior to or more primitive than cognitive ones. For example, basic responses (pleasure, aversion) may be experienced before the individual is aware of the object provoking the reaction, that is, before classifying and recognising that object.<sup>1</sup> This means

that emotion plays an unmistakable role in the adaptation process by allowing us to attach importance to stimuli or events that could either jeopardise or favour survival.<sup>2</sup> We attach importance to such stimuli based on the way that emotion evokes memory.

The amygdala and the hippocampus are the brain structures responsible for facilitating memory. Both structures are located in the medial temporal lobe, and they are related to independent memory systems that interact with each other in emotionally charged situations. In this sense, the amygdala is able to modify the way memories dependent on the hippocampus are encoded and stored. Likewise, the hippocampus can influence the amygdala's response by creating episodic representations of the emotional meaning and interpretation of events.<sup>3</sup> Different neuroimaging studies have found correlations between the activity registered in the amygdala and the hippocampus while emotional information is being encoded.<sup>4–6</sup> At the same time, patients with atrophy of the amygdala exhibit an inverse correlation

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between the degree of atrophy and the level of activity in the hippocampus while emotions are being processed.<sup>7</sup>

This interaction is reflected by the way that emotion facilitates memory. This phenomenon has been demonstrated in animal experiments<sup>8</sup> demonstrating that chimpanzees were better able to recognise negative (aggressive) photographed images than those that would be neutral in that animal's social context. It has also been observed in humans<sup>9</sup> through incidental recognition tasks with short retention intervals in which negative information was recognised more accurately than positive information. The authors explain why it is that negative emotional content of the photographs is more relevant to survival, and state that this tendency is also reflected in tasks in which the subject does not deliberately encode the information (incidental recognition).

This brief summary of the theoretical background and the experimental data mentioned above allow us to speculate on the possibility of drawing on the most basic emotional levels (pleasure, aversion) in order to understand how those levels facilitate the evoking of memory in its most primitive and survival-promoting form. This may be done using the multi-level method for inducing emotions developed by Lang et al.,<sup>10</sup> the *International Affective Picture System* (IAPS), which induces emotions according to the levels of valence and arousal associated with an array of visual stimuli (photographs). This standardised system of emotion induction has been widely used in a number of different research projects. Most of these projects are oriented towards the study of basic psychological processes – learning, emotion, motivation, and attention – by measuring electrodermal response,<sup>11</sup> evoked potentials,<sup>12</sup> and heart rate.<sup>13</sup> The emotion induction system has also been used to study different research topics related to illnesses such as Alzheimer,<sup>14</sup> anxiety,<sup>15</sup> depression,<sup>16</sup> and schizophrenia,<sup>17</sup> and in these studies, it was shown to mark specific patterns of emotional response to stimuli for different mental disorders, including mood disorders.<sup>18</sup>

Data obtained for Alzheimer disease (AD) are especially relevant. Damage caused by this disease to the independent memory systems constituted by the amygdala and hippocampus give rise to symptoms that describe both the functional delimitations of each structure and the way the 2 structures interact in emotionally charged situations. To date, various studies have addressed this topic. Some authors have reported absence of the memory-facilitating effect in forms of AD,<sup>19</sup> or facilitation of positive emotions but not of negative ones.<sup>20</sup> The latter phenomenon was recently linked to spatial memory.<sup>21</sup> These discrepancies arise from the different numbers and types of stimuli employed, stimulus exposure time, and means of information recovery (recognition vs free memory).

In order to shed light on such findings, Gordillo et al.<sup>22</sup> provided a series of recommendations that may be useful in detecting impaired interaction between the amygdala and the hippocampus, that is, between emotion and memory. We propose using a multi-level induction method such as IAPS, incidental recognition memory tasks, and use of analytical measurements based on signal detection theory (SDT). These suggestions will allow us to exert better control over the stimuli that are used, and will also result in a less demanding experience for participants, during both

encoding and retrieval (recognition), due to the task being incidental. Lastly, using a method for measuring stimulus detectability will be much more precise than recurring to the percentage of correct responses as is typically done.

These methodological suggestions should be applied in the preclinical phase of Alzheimer disease since the sensitivity of a study of this type plus data from other longitudinal studies will allow us to verify its predictive value. Using this method on patients diagnosed with AD reveals impairment, as has been demonstrated by certain studies.<sup>19,20</sup> An alternative explanation may reside in the deficits that these patients display in multiple cognitive processes. Lastly, we should mention that variables such as the number of stimuli employed, the valence and arousal levels associated with them, and exposure time are all very relevant and must be determined in pilot studies that match the study group's abilities to the purposes of the research.

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## Interhemispheric lipoma associated with agenesis of the corpus callosum<sup>☆</sup>

### Lipoma interhemisférico asociado a agenesia del cuerpo calloso

Dear Editor:

Intracranial lipomas are uncommon and benign congenital malformations that account for only 0.03% to 0.08% of all types of intracranial masses.<sup>1</sup> They are usually located in the interhemispheric fissure, especially in the corpus callosum. Lipomas of the corpus callosum are frequently associated with other congenital malformations of that structure, such as agenesis, hypoplasia, or hypertrophy. Since half of all cases are asymptomatic, they are only diagnosed based on incidental findings in neuroimaging studies. In the remainder of the cases, they are associated with neurological symptoms such as psychomotor retardation, headache, epilepsy, and cerebral palsy.

Our patient was a 23-year-old woman with a history of migraine without aura. Her gestation and birth were uneventful and psychomotor development was normal. She did not suffer from any febrile seizures, cranial trauma, or central nervous system infections during childhood. She had no family history of epilepsy or any other neurological disorders.

The patient visited the emergency department with symptoms of disorientation and buccofacial movements suggesting complex partial epileptic seizure. Neurological

examination was normal. The cranial CT scan carried out in the emergency department (Fig. 1) showed absence of the corpus callosum and a hypodense homogeneous lesion in its location. We observed curvilinear calcifications on both sides of the lesion. Findings suggested agenesis of the



**Figure 1** Cranial CT scan: hypodense image measuring 5 cm × 3 cm in the area of the corpus callosum (arrow). It is surrounded by mural calcifications on both sides. Its density is indicative of fat content. Agnesis of the corpus callosum.

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