



the occurrence of episodic spontaneous stereotyped movements and the prolonged maintenance of posture (catalepsy). Previous functional cerebral imaging studies have reported the implication of the vermis in the maintenance of standing postures.<sup>2</sup> The high metabolic activity observed in the motor cortex could be related to reduced neuronal inhibition. Indeed, reduced density of inhibitory GABA receptors in this area has been reported in catatonia.<sup>3</sup> Previous imaging studies found dysfunctional posterior lateral parietal cortex in the catatonic state.<sup>4</sup> PET1 analysis showed hypofunction of this left region which persisted after clinical remission. So, this regional dysfunction is not sufficient to lead to akinetic catatonia but it might have participated in the disturbance of executive tasks planning.

Patients with akinetic catatonia are classically unresponsive to their environment.<sup>1</sup> This symptom characterises the stuporous state encountered in this syndrome. The exclusive masking analysis demonstrated reduced activity in the medial prefrontal cortex during akinetic catatonia. Previous functional imaging studies showed that the ventral medial prefrontal cortex is implicated in the integration of the visceromotor aspects of emotional processing with information gathered from the internal and external environments.<sup>5</sup> The dorsal medial prefrontal cortex has been involved in explicit representations of states of the "self".<sup>5</sup> Dysfunction of these brain areas might therefore explain the stuporous state observed in akinetic catatonia. Activity within

the precuneus has been implicated in the representation of the world around us and the lateral parietal cortex is known to participate in conscious awareness.<sup>5</sup> PET1 analysis showed that these two regions presented a decrease of metabolism that persisted on PET2. This persistence could be related to the hypomaniac state presented at the time of PET2, a state, which differs from the resting state of the control subjects. Indeed, high level of glucose metabolism in the precuneus and lateral parietal cortex is the metabolic hallmark of the normal resting state.<sup>5</sup> Despite its persistence after catatonia remission, dysfunction of these regions during the akinetic catatonic state may be a prerequisite for the establishment of its stuporous aspect, as supported by studies on patients with reduced level of consciousness.<sup>5</sup>

In conclusion, some motor symptoms usually encountered in akinetic catatonia may be related to dysfunction of prefrontal cortical areas but also primary motor cortex, striatum, and vermis. This case of akinetic catatonia also brings new clues for the involvement of the medial prefrontal cortex in conscious awareness.

**X De Tiège, S Laureys, S Goldman**

PET/Biomedical Cyclotron Unit, Erasme Hospital,  
Free University of Brussels, Brussels, Belgium

**X De Tiège, I Massat, F Lotstra, J Mendlewicz**

Department of Psychiatry, Erasme Hospital, Free  
University of Brussels

**J-C Bier**

Department of Neurology, Erasme Hospital, Free  
University of Brussels

**J Berré**

Intensive Care Unit, Erasme Hospital, Free  
University of Brussels

Correspondence to: Dr X De Tiège, PET/Biomedical  
Cyclotron Unit and Department of Psychiatry,  
Erasme Hospital, Free University of Brussels,  
Brussels, Belgium; xdetiege@hotmail.com

## References

- 1 **Northoff G**, Koch A, Wenke J, *et al*. Catatonia as a psychomotor syndrome: a rating scale and extrapyramidal motor symptoms. *Mov Disord* 1999;**14**:404–16.
- 2 **Ouchi Y**, Okada H, Yoshikawa E, *et al*. Absolute changes in regional cerebral blood flow in association with upright posture in humans: an orthostatic PET study. *J Nucl Med* 2001;**42**:707–12.
- 3 **Northoff G**, Steinke R, Czervinka C, *et al*. Decreased density of GABA-A receptors in the left sensorimotor cortex in akinetic catatonia: investigation of in vivo benzodiazepine receptor binding. *J Neural Neurosurg Psychiatry* 1999;**67**:445–50.
- 4 **Northoff G**, Steinke R, Nagel DC, *et al*. Right lower prefronto-parietal cortical dysfunction in akinetic catatonia: a combined study of neuropsychology and regional cerebral blood flow. *Psychol Med* 2000;**30**:583–96.
- 5 **Gusnard DA**, Raichle ME. Searching for a baseline: functional imaging and the resting human brain. *Nat Rev Neurosci* 2001;**2**:685–94.