

## PARKINSON DISEASE

### Visual hallucinations in Parkinson disease are associated with cholinergic dysfunction

Italian researchers have employed a simple, noninvasive, technique to determine the functionality of an inhibitory cholinergic circuit within the brain. The results provide further evidence that visual hallucinations in patients with Parkinson disease (PD) are highly likely to be the result of central cholinergic system dysfunction. This technique might also be able to identify which patients with PD are expected to develop dementia with PD progression.

“...a strong association between SAI abnormalities and visual hallucinations in patients with PD [exists]”

Patients with PD can experience visual hallucinations, which seem not to result from the dysfunction in the dopaminergic system that is responsible

for the characteristic motor symptoms of the disease. These visual hallucinations are often disturbing and are a risk factor for dementia and increased mortality. At present, no method exists to predict which individuals with PD are likely to develop visual hallucinations or dementia.

Transcranial magnetic stimulation (TMS) of the motor cortex can produce motor-evoked potentials (MEPs) in muscles of the hand. Peripheral nerve afferent input into the somatosensory cortex, applied before TMS, inhibits these MEPs through an inhibitory cholinergic pathway. “This inhibition is lost in patients with cholinergic dementias and preserved in non-cholinergic dementias,” notes senior researcher Lucio Santoro (University of Naples, Italy). Santoro and colleagues used this technique, called short-latency afferent inhibition (SAI), to investigate whether dysfunction in the cholinergic pathway is evident in patients

with PD with visual hallucinations, and they report a strong association between SAI abnormalities and visual hallucinations in patients with PD. Furthermore, visuospatial and attentional/frontal lobe functions were markedly impaired in PD patients with visual hallucinations compared with patients without hallucinations.

“These results are consistent with the already known observation that visual hallucinations in PD are predictive of cognitive decline,” comments Santoro. He concludes that “the next step will be to verify if SAI abnormalities can really predict cognitive decline in a PD population.”

Nick Jones

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