NEURODEGENERATIVE DISEASE

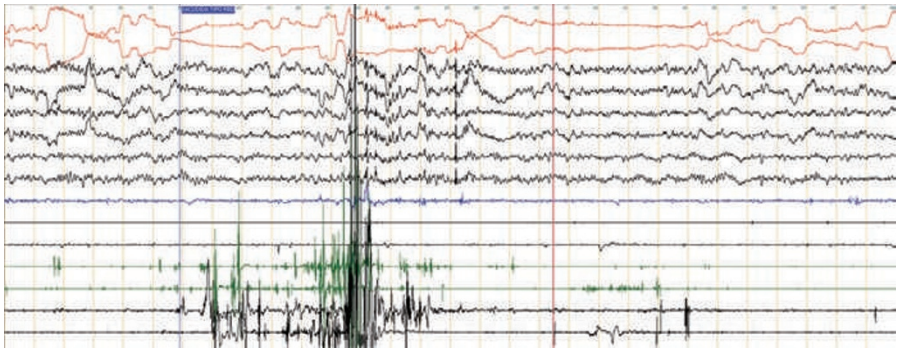
Sleep disorder provides a clue to early disease detection

Patients with idiopathic rapid eye movement sleep behavior disorder (IRBD)—a condition characterized by dream-enacting behavior—often develop neurodegenerative diseases such as Parkinson disease (PD). A new study has shown that neuroimaging can detect early changes in the brains of patients with IRBD who later develop neurodegenerative diseases.

"In 2006, we described that after a mean follow-up of 5 years, ≈50% of patients with IRBD developed a neurodegenerative disease," says lead investigator Alex Iranzo. Patients with IRBD were, therefore, identified as having an increased risk of developing neurodegenerative disorders, but the researchers had no way of identifying which patients would develop these diseases.

Many neurodegenerative disorders have latent periods, during which neuropathological characteristics of the disease develop in the absence of clinical symptoms, and neuroprotective therapies could potentially be most effective at these time points. However, identifying patients at early stages of disease development is difficult.

Two neuroimaging techniques—dopamine transporter (DAT) imaging and transcranial sonography (TCS)—can identify early PD-associated changes in the substantia nigra. The researchers suggested that such changes might occur in patients with IRBD who would later develop neurodegenerative disorders. Therefore, these two techniques could be used to identify patients with IRBD at early stages of the disease process.



30 s epoch of polysomnogram showing the classic features of idiopathic rapid eye movement (REM) behavior disorder: REM sleep with increased phasic electromyographic activity in the lower limbs (channels 10–14 in black and green) as the patient was kicking. Image provided by Dr Alex Iranzo.

43 patients with IRBD and a control group were analyzed at baseline with DAT imaging and TCS for abnormalities in the substantia nigra. 2.5 years later, the patients were clinically assessed for neurological disorders. In the IRBD group, 20% of patients, all of whom had shown abnormal imaging results at baseline, had developed a neurodegenerative disease at follow-up. Conversely, all patients with normal neuroimaging results at baseline remained disease free at follow-up.

These results show that early striatal changes occur in otherwise healthy patients with IRBD who go on to develop neurodegenerative disorders. The identification of these individuals "would be of great importance when neuroprotective strategies become available," says Iranzo. His team is continuing to monitor the patients who participated in this study.

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Original article Iranzo, A. *et al.* Decreased striatal dopamine transporters uptake and substantia nigra hyperechogenicity as risk markers of synucleinopathy in patients with idiopathic rapid-eye-movement sleep behaviour disorder: a prospective study. *Lancet Neurol.* doi:10.1016/S1474-4422(10)70216-7