TRANSCRANIAL SONOGRAPHY IN ESSENTIAL TREMOR AND IN RESTLESS LEGS SYNDROME

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Tremor is the key symptom of essential tremor, the most common movement disorder, but also occurs frequently in PD. Clinically, it may be sometimes difficult to distinguish between essential tremor and tremor-dominant PD, particularly in early stages of the disease.

Hyperechogenicity of the SN is a typical finding in about 90% of patients with PD, but not in patients with essential tremor (ET). In ET patients, the prevalence of hyperechogenicity is in the range of healthy control subjects or slightly above, which may indicate an increased risk for PD in the subgroup of ET patients with SN hyperechogenicity. Other TCS findings did not discriminate between these entities. These findings suggest that assessment of SN echogenicity could be useful to support differential diagnosis of essential tremor vs. PD.

Restless legs syndrome (RLS) is one of the most common neurological disorders, with an age-dependent prevalence of 5–15%. It is largely underdiagnosed and often insufficiently treated. The four key symptoms include: irresistable urge to move the legs, sensory leg discomfort, occurrence at rest and relief with moving around, and circadian rhythm with most pronounced symptoms at night. Many patients suffer additional symptoms such as sleep disturbances, involuntary periodic leg movements (PLM), depression, anxiety, polyneuropathy, or chronic pain. Most of these disorders are difficult to distinguish from RLS and may occur secondary to RLS symptoms, may mimic RLS, may be mistaken for RLS, and may even cause symptomatic forms of the disorder.

Very recently, using transcranial B-mode sonography (TCS), a morphological abnormality, hypoechogenicity of the substantia nigra (SN), which accurately differentiates idiopathic RLS patients and controls. SN hypoechogenicity has good sensitivity and specificity for RLS. The positive predictive value for RLS is very high. Furthermore, raphe hypoechogenicity (70%) and RN hyperechogenicity (60%) are more commonly found in RLS patients than in controls.

There are no specific abnormalities of the basal ganglia, ventricular system, or cerebral lobes in RLS patients. The three sonographic abnormalities typical for RLS patients were also frequently found in the control subjects: SN hypoechogenicity (17%), raphe hypoechogenicity (26%), and RN hyperechogenicity (26%). However, in the control population, they were independent features, as most controls showed only one abnormality or none. In contrast, in RLS patients the three sonographic features typically co-occurred as the majority of patients exhibited two or three of these sonographic features. Assessment of all sonographic features, therefore, increases the diagnostic accuracy and specificity of TCS for RLS compared to the assessment of SN echogenicity alone. The correlation of raphe hypoechogenicity and depression had been demonstrated previously for primary depressive disorders such as major depression and depression in Parkinson's disease suggesting that RLS-associated depression may also be a primary depressive disorder rather than a secondary condition resulting from RLS-related severe sleep deprivation. The origin of RN hyperechogenicity is, to date, unknown and needs to be addressed in further studies. Although there are significant differences of SN echogenicity and the combination of sonographic features between idiopathic and secondary RLS patients, still the majority of sRLS patients (60%) show the same morphological abnormalities as iRLS patients.