

## **Brain Connectivity in Hyperkinetic Movement Disorders**

### **Abstract**

Hyperkinetic movement disorders (HMDs) are characterized by an excessive degree of involuntary motor activity and are classified by their clinical phenomenology. The five major categories include tremor, dystonia, chorea, tics, and myoclonus. The presence of an HMD suggests dysfunction in the motor control regions of the brain, including the basal ganglia, cerebellum, thalamus, supplementary motor cortex, premotor cortex, and their pathways. Connections between these different brain areas can be revealed through the use of some neurophysiological techniques, such as transcranial magnetic stimulation. In addition, in recent years, several neuroimaging techniques have been exploited with the objective of defining a comprehensive map of the neural connections, both in terms of anatomical and functional connectivity. These observations have changed the historical concept of functional alteration limited to basal ganglia, evolving the idea of HMDs as structural/functional network disorder.

Our deepened understanding of HMDs pathophysiology through the use of new MRI techniques, alone or together with neurophysiological methods, may potentially improve diagnostic accuracy, define new possible targets for neuromodulation and predict surgical/medical treatment outcome.

### **References**

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