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Movement disorders

Paroxysmal movement disorders: An update

A. Méneret [a,b], E. Roze [a,b,*]

[a] Inserm U 1127, CNRS UMR 7225, Sorbonne University Group, UPMC University Paris 06 UMR S 1127, Brain and Spine Institute, ICM, 75013 Paris, France
[b] AP–HP, Pitié-Salpêtrière Hospital, Department of Neurology, 75013 Paris, France

INFO ARTICLE

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ABSTRACT

Paroxysmal movement disorders comprise both paroxysmal dyskinesia, characterized by attacks of dystonic and/or choreic movements, and episodic ataxia, defined by attacks of cerebellar ataxia. They may be primary (familial or sporadic) or secondary to an underlying cause. They can be classified according to their phenomenology (kinesigenic, non-kinesigenic or exercise-induced) or their genetic cause. The main genes involved in primary paroxysmal movement disorders include *PRRT2*, *PNKD*, *SLC2A1*, *ATP1A3*, *GCH1*, *PARK2*, *ADCY5*, *CACNA1A* and *KCNA1*. Many cases remain genetically undiagnosed, thereby suggesting that additional culprit genes remain to be discovered. The present report is a general overview that aims to help clinicians diagnose and treat patients with paroxysmal movement disorders.

Paroxysmal neurological disorders are characterized by episodes of neurological dysfunction that are either isolated or part of a more complex disorder with interictal manifestations. They encompass apparently heterogeneous disorders such as migraine, epilepsy, periodic paralysis and paroxysmal movement disorders. They are, however, all linked by a common pathophysiological feature, namely neuronal hyperexcitability, and by overlapping genetic causes.

Paroxysmal movement disorders are rare disorders that can be divided into paroxysmal dyskinesias (PxDs) and episodic ataxias (EAs). PxDs are characterized by attacks of dystonic and/or choreic movements, whereas EAs are defined by attacks of cerebellar ataxia. They may be primary (mostly of genetic origin) or secondary to underlying causes, such as lesions of the central nervous system or metabolic disorders. Primary PxDs may be familial or sporadic, with onset in either childhood or adolescence.

A new classification is emerging, based on both clinical and genetic characteristics [1]. Indeed, recent genetic advances are rendering the historical, clinically based classification obsolete: a given paroxysmal movement disorder can be caused by mutations in various genes, while mutations in a given gene can give rise to various paroxysmal disorders. The present review provides an update on the clinical characteristics, genetic causes and pathophysiology of paroxysmal movement disorders.

* *Corresponding author*. Department of Neurology, Pitié-Salpêtrière Hospital, 47-83, boulevard de l'Hôpital, 75651 Paris cedex 13, France.
E-mail address: flamand.roze.75012@gmail.com (E. Roze).

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1. Clinical characteristics and phenomenological classification

The first step in the diagnostic process is to determine whether the disorder is likely to be primary or secondary. Signs of an underlying cause include onset in adulthood, the absence of a family history, variable duration of attacks and triggering factors, abnormal interictal clinical status, and abnormal laboratory or magnetic resonance imaging (MRI) findings. Clinical classification is based on the phenomenology, triggering factors and duration of attacks; a diagnostic algorithm can provide some guidance (Fig. 1). However, some patients may have paroxysmal movement disorders that do not fall into any of the proposed categories, and paroxysmal events corresponding to more than one category may be present in a given case.

1.1. *Paroxysmal kinesigenic dyskinesia*

Paroxysmal kinesigenic dyskinesia (PKD) is characterized by attacks of dystonia and/or chorea triggered by sudden voluntary movement and lasting from a few seconds to a minute (see Box 1) [2]. PKD is the most frequent form of PxD, albeit with an estimated prevalence of only 1:150,000 [3]. Onset is usually in childhood or adolescence, with a reported range

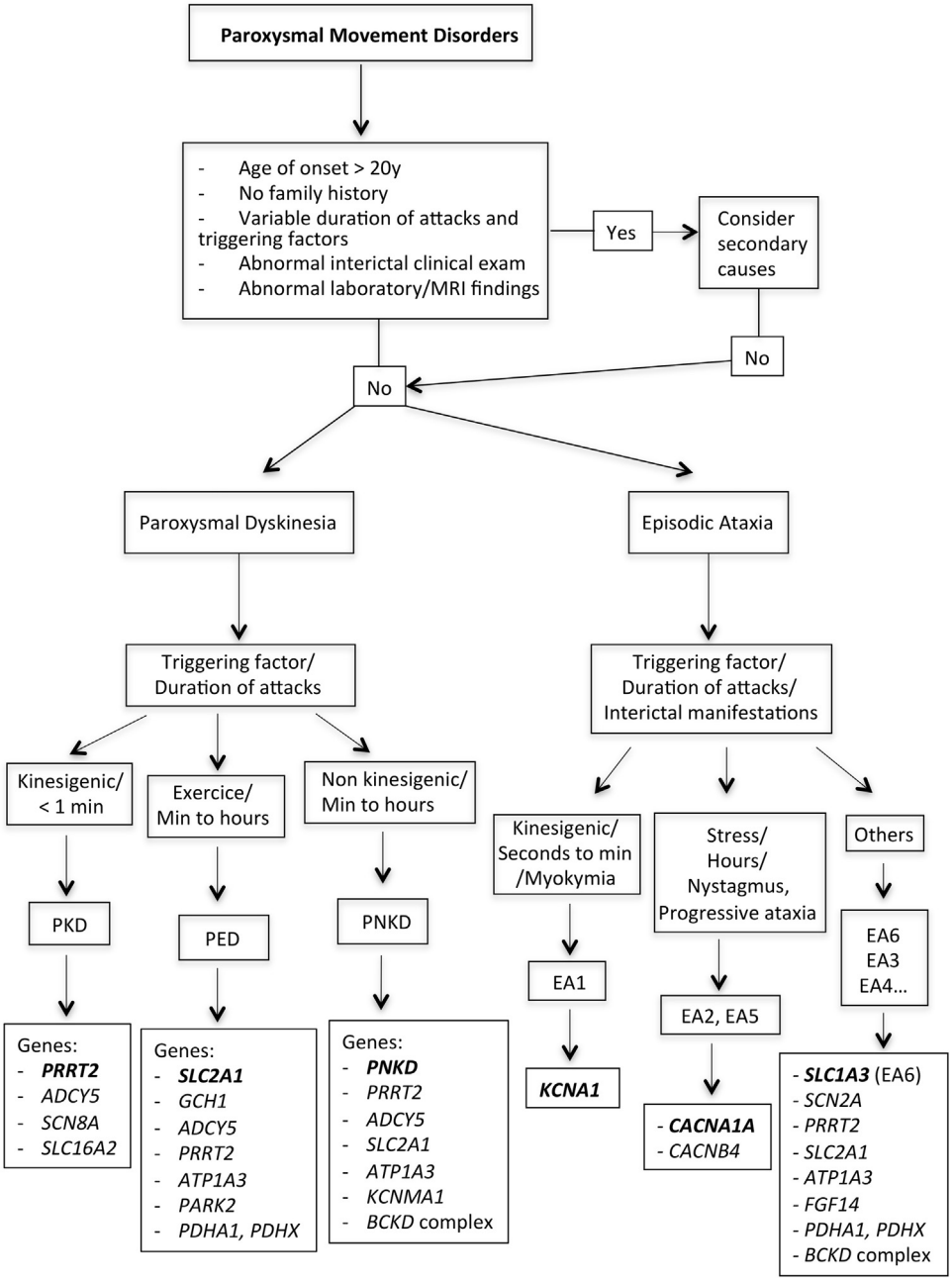

Fig. 1 – Diagnostic algorithm for paroxysmal movement disorders. MD: movement disorders; PKD: paroxysmal kinesigenic dyskinesia; PNKD: paroxysmal non-kinesigenic dyskinesia; PED: paroxysmal exercise-induced dyskinesia; EA: episodic ataxia.