Canine Paroxysmal Movement Disorders

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KEYWORDS

• Episodic movement disorders • Hypertonicity • Episodic falling
• Hyperkinetic episode • Paroxysmal dyskinesia • Scottie cramp

KEY POINTS

- Paroxysmal dyskinesias form a heterogeneous group of disorders recognized with increasing frequency in dogs and characterized by episodic, involuntary, abnormal movements.
- Classification of these disorders in veterinary medicine has not been attempted, but most seem to be comparable to paroxysmal nonkinesigenic dyskinesia in humans.
- Hypertonicity of limbs characterized by sustained flexion (dystonia) and brief flexion (chorea) of muscles are common clinical signs.
- During an episode, affected animals do not exhibit autonomic signs, electroencephalographic abnormalities, or change in consciousness.
- Clinical signs do not usually respond to antiepileptic drugs.

INTRODUCTION

Movement disorders are a heterogeneous group of diseases in humans and animals characterized by involuntary movements without changes in consciousness. Episodic or paroxysmal movement disorders can be broadly classified into paroxysmal dyskinesias and episodic ataxias; episodic ataxias are usually grouped with hereditary ataxias and will not be considered further in this review. The paroxysmal dyskinesias are a fascinating group of central nervous system diseases that produce dramatic and often puzzling clinical signs, canine examples of which have been described in veterinary medicine from as early as the 1940s.[1] However, it is only recently that these diseases have been grouped together under the label of paroxysmal dyskinesia and their genetic causes investigated in detail. They are characterized by episodic hyperkinesis

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impairing posture and locomotion without loss of consciousness.[2] Chorea, dystonia, ballism, and athetosis are all signs of hyperkinesis that are common to the phenomenology of this group of diseases (**Box 1**). They are differentiated from seizures because, during episodes, consciousness and electroencephalography (EEG) are normal and there is a lack of autonomic signs. However, differentiation from seizures can be difficult, and now that the underlying genetic mutations are described in humans, it is becoming clear that specific mutations in dyskinesia patients may also be associated with seizures (eg, familial infantile convulsions with paroxysmal choreoathetosis) or a high frequency of seizure disorders in their families.[3]

Paroxysmal dyskinesias (PDs) can be primary, secondary, or part of more complex neurologic syndromes.[3] This review focuses on the primary PDs, in which patients are normal between episodes; however, it is important to note that an example of a secondary dyskinesia has been described in veterinary patients.[4] In humans, classification of PDs has evolved over time. Initially, they were described by their clinical signs, leading to terms such as paroxysmal choreoathetosis. More recently, a clinically useful classification system has been developed in which patients are categorized by the precipitants, age of onset and duration of attacks.[5] There are 3 main forms: (1) Paroxysmal kinesigenic dyskinesia (PKD), in which episodes are precipitated by sudden movements; (2) paroxysmal nonkinesigenic dyskinesia (PNKD), in which episodes are not triggered by movements, but may be associated with stress, alcohol, or caffeine; and (3) paroxysmal exertion-induced dyskinesia, in which heavy exercise produces signs.[5] A fourth form known as paroxysmal hypnogenic dyskinesia in which episodes occur during sleep has been reclassified as a frontal lobe epilepsy and removed from the classification system. Key features of each type of dyskinesia are listed in **Table 1**. Note also that the genetic causes described to date are listed and show that, although the clinical categorization is useful, genetic definition of the disorders shows crossover between types, and new classification systems in which the disease is first assigned to a category as described, and then assigned to a genetic category, are emerging.[3]

In veterinary medicine, paroxysmal dyskinesia has been used as a broad term to describe an abnormal, sudden, involuntary contraction of a group of skeletal muscles that recurs episodically.[6] This group of diseases is not well categorized and names

Box 1
Terms used to describe involuntary movements in human medicine

- Hyperkinesis: General term for increased muscle activity.
- Dyskinesia: Impairment of voluntary movements
- Chorea: Brief muscle contractions producing rapid movements similar to those seen during dancing. Frequently accompanied by athetosis giving rise to the term choreoathetosis.
- Dystonia: Sustained muscle contractions producing abnormal movements and postures
- Ballism: Flailing limb movements
- Athetosis: Writhing movements produced by sustained contraction of the trunk muscles. This is frequently accompanied by chorea.
- Movements affecting 1 side of the body are identified by the prefix "hemi"

Although the term dystonia is commonly used in canine reports, and ballism is occasionally reported, the terms chorea and athetosis are rarely used. This may reflect species differences or a failure to recognize these signs in dogs.

Data from Bhatia KP. Paroxysmal dyskinesias. Mov Disord 2011;26(6):1157–65.