Sleep Movement Disorders and Neurologic Movement Disorders

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KEYWORDS

• Movement disorders • Neurologic injury • Epilepsy • Rhythmic movement body disorder
• Somnambulism • Somniloquy

KEY POINTS

- This article will discuss common sleep movement disorders and neurologic movement disorders.
- Neurologic injury, such as stroke or traumatic brain injury, often markedly alters sleep.
- Sleep movement disorders, including frontal lobe epilepsy, somnambulism, somniloquy, rhythmic movement body disorder, REM behavior disorder, and restless leg syndrome, are discussed.

INTRODUCTION

In this article we discuss 2 types of movement disorders. First, we briefly discuss common sleep movement disorders and, second, we discuss neurologic movement disorders. Neurologic injury, such as stroke or traumatic brain injury, often markedly alters sleep, and we cover much of that in detail as well.

There are a variety of "things that go bump in the night." These could be roughly lumped into the category of sleep movement disorders. To begin with, epilepsy often arises from sleep and is more common in sleep than in wake. Frontal lobe epilepsy can be difficult to diagnose because stereotypic behaviors can be seen, and, thus, the epilepsy can be mistaken for a parasomnia or even conversion disorder.

Somnambulism, or sleep walking, and somniloquy, or sleep talking, are common events. These are the most common parasomnias. They arise primarily out of stage 3 or slow-wave sleep (SWS). This is extremely common in childhood but still may occur in adulthood.

Rhythmic movement body disorder or bed rocking is an idiopathic disorder that is common in childhood but does occasionally persist in adulthood. A persistent rocking motion or head hitting pillow motion may occur at the beginning of sleep or even throughout the night. Multiple medication attempts have generally been unsuccessful. The use of a water bed may actually be the most effective therapy. Hypnosis has also been tried. Rhythmic movement disorder can be a frontal lobe seizure, so investigation is indicated before assigning this diagnosis.

Restless legs syndrome (RLS) is a common disorder. There are 2 groups of patients. One is an autosomal dominant inherited group, usually with onset early in life such as teenage years. These patients have a creepy, crawly feeling, usually on the legs or sometimes on arms. All 4 extremities can be involved. There is an urge to move, and it is actually quite difficult for these patients to hold still for an entire hour. The second form is associated with iron deficiency. It can also be known to occur after beginning certain medications such as

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tricyclic antidepressants. Parkinson's medications are used to treat this disorder but paradoxically can sometimes make it worse. There is a clinical correlate during sleep that is called periodic limb movement disorder. Periodic limb movement disorder can be associated with a number of other sleep disorders, in particular obstructive sleep apnea (OSA). The association with sleep apnea is not well understood. The periodic limb movement disorder is typically in the first third of the night with muscle contractions lasting 0.5 to 5.0 seconds at regular intervals of 40 to 90 seconds. Periodic limb movements are not generally seen during rapid eye movement (REM) sleep. Most experts think that periodic limb movements need to show evidence of an accompanying arousal to be considered clinically significant. In fact, periodic limb movements cannot be staged or counted if they occur within an OSA because there is an association with OSA (which is poorly misunderstood, yet real).

Finally, REM behavior disorder is a fascinating disorder that, again, is closely tied to parkinsonism and is discussed in detail within this article. In brief, REM sleep behavior disorder represents loss of skeletal muscle paralysis such that active movement occurs during REM sleep. Thus, there is a loss of inhibition for this activity. The minimum criteria for diagnosis are the following:

1. Suggestive history with polysomnographic abnormality during REM sleep showing elevated electromyographic (EMG) tone;
2. Documentation of abnormal REM sleep behavior during the polysomnogram (PSG), such as prominent limb or truncal jerking, or vigorous, complex or even violent behavior; and
3. Absence of electroencephalogram (EEG) epileptic form activity.

SPECIFIC DISORDERS AND THE ASSOCIATED SLEEP MOVEMENT RESPONSE THAT MAY OCCUR

Stroke

Strokes may occur in a number of discrete loci within the brain and, thus, sequelae vary depending on the lesion. Unfortunately, strokes remain common. Hypersomnia occurs in 22% of patients after an ischemia stroke. Sleep apnea is also common after stroke, occurring in up to 71% of patients after cortical stroke.[1] Insomnia, likewise, is common after stroke.

RLS and increased periodic limb movements of sleep (PLMS) have been reported by numerous investigators to follow stroke. REM sleep behavior disorder, likewise, has been seen to arise after stroke. And, finally, seizures are well known to occur as a new entity in patients following stroke.

In particular, nocturnal frontal lobe epilepsy (NFLE) may occur as a form fruste movement disorder following stroke.[2] NFLE arises from sleep 90% of the time. It now encompasses what had previously been called paroxysmal nocturnal dystonia (PND). PND is now known to be a form of frontal lobe seizure. NFLE can be very difficult to distinguish from parasomnia.

Some useful differentiations include the following:

1. Parasomnia onset is almost always in those younger 10 years and NFLE can begin at any age.
2. There are typically only 1 or 2 parasomnias per night, whereas NFLEs are commonly 3 or 4 per night. This equates to 20 to 40 NFLE episodes per month; whereas parasomnias tend to be less than four per month.
3. Parasomnias usually disappear in adolescence, although they can persistent into adulthood.
4. Episodes are seconds to 3 minutes for NFLE, whereas they are seconds to 30 minutes for parasomnias.
5. NFLEs are highly stereotyped, frequently vigorous. Parasomnias are rarely stereotyped but can be violent.
6. There are no known triggers for NFLE except perhaps for sleep deprivation. Triggers for parasomnias are thought to be stress or emotional trauma.
7. Frankly epileptiform ictal movements are only in 10% of NFLEs, so EEG is not a perfect "gold standard." EEG shows activity plus SWS in parasomnia.
8. Parasomnias are almost always out of stage 3, whereas NFLEs primarily occur in stage 2.

Medications

Obviously, it will be important to realize that the therapies that we initiate in any setting (outpatient, hospital, or skilled nursing facility/rehabilitation center) may have unexpected consequences. It is extremely common for certain medications to worsen or induce new sleep disorders. RLS can be induced by escitalopram, fluoxetine, L-dopa/carbidopa and pergolide, L-thyroxine, mianserin, mirtazapine, olanzapine, and tramadol. Periodic limb movements of sleep are worsened by this list but may also particularly be worsened by bupropion, citalopram, fluoxetine, paroxetine, sertraline, and venlafaxine.[3]

Of course, it should be remembered that many medications have predictable side effects, that