Article Feature:

Movement Disorders in Sleep

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MOVEMENT DISORDERS IN SLEEP

Movements in sleep may occur in wake-sleep transition, non-rapid eye movement (NREM) and rapid eye movement (REM) or dream sleep. These movements may be simple or part of a complex combination of actions or behavioural activities (parasomnias) accompanied by emotional outbursts. They may be noticed by the sleeper but more often than not, brought to the sleeper's attention by concerned bed partners or relatives. Benign (no/minimal effect on sleep & general health) movements encountered in sleep include hypnic jerks (sleep starts), rhythmic movement disorders, sleep walking and sleep terrors.

Hypnic jerks

These are simple, quick jerks (myoclonus) of the arms, legs or trunk often associated with a sense of falling through space or into a deep hole terminating in an arousal occurring at the transition from wake to sleep. These jerks are not associated with any underlying illness and often do not require any treatment. They may, however, warrant further evaluation and treatment should they be exaggerated in some instances causing frequent arousals at sleep onset and impairing sleep initiation.

Rhythmic Movement "Disorder"

These are usually seen in young children and may consist of rhythmic head banging, shaking or body rocking movements at wake-sleep transition or sleep onset. They usually last seconds to minutes and are generally benign, remitting with age but may be persistent in children with underlying cognitive impairment.

Sleep walking

This is, as with most NREM parasomnias, more prevalent in children and may consist of simple activities such as sitting up in bed, walking or more complex ones like dressing/undressing, cleaning, grabbing at objects or sms-ing. Like most NREM parasomnias, sleep walking may be triggered by sleep deprivation, tiredness, fever or illness. While it is prudent to make the home environment safe to prevent injuries, sleep walkers may often also be gently guided back to bed safely.

Sleep terrors

This is characterized by an arousal, usually in the first hours of sleep, associated with an inconsolable terror. The sufferer awakes (partial regaining of consciousness), screams, appears confused, disoriented with semi-purposeful/purposeless movements and is unresponsive to attempts at soothing him/her. The episode usually lasts minutes and the subject is usually amnestic of the event the next morning.

Treatment of the above more benign conditions often revolve around avoiding or managing trigger factors like sleep deprivation, tiredness, intercurrent illness, offending medications and proper sleep hygiene.

Other movement disorders noted in sleep may be more disruptive, injurious or indicate concomitant sleep-related disorders. These include periodic limb movement disorder, sleep paralysis, REM behaviour disorder and sleep-related epilepsy syndromes.

Periodic Limb Movements in Sleep

These are quick jerks (myoclonus) usually of the legs (triple flexion of hips, knees and ankles) recurring at intervals of 5-90 seconds lasting 0.5-5 seconds in duration. If these are associated with frequent nocturnal arousals and symptoms of excessive daytime sleepiness, the condition is then termed Periodic Limb Movement Disorder.

The latter may be associated with use of hypnotics, benzodiazepine withdrawal, Parkinson's disease, Restless Legs Syndrome and sleep-related breathing disorders. Treatment involves treating underlying causes for the condition; medications effective for these movements and the arousals associated with them include anti-Parkinson's drugs, benzodiazepines, anti-convulsants and narcotics.

Sleep Paralysis

This is the inability of the limbs and trunk to move upon sleep onset or arousal.

Episodes usually last minutes and may be terminated by external stimuli. Eye movements and respiration are intact and the experience may be very frightening for the sufferer. Sleep paralysis may be familial or isolated from other symptoms associated with concurrent sleep disorders like narcolepsy.

REM Behaviour Disorder (RBD)

Dreams occur during REM sleep and generalized muscle atonia (loss of muscle tone) prevents one from re-enacting dream content. Patients with RBD lose this muscle atonia and are able to re-enact their dreams. The latter are usually violent, action-filled or unpleasant. The movements, actions and behaviours exhibited during these episodes are consistent with the reported dreams (patients remember their dreams but not re-enacting them). These episodes may often cause injury to the patient or, not infrequently, their bed partners. Unlike NREM parasomnias, RBD occurs mainly in elderly adults. 60% of cases are idiopathic while the others are associated with neurologic disorders such as dementia, subarachnoid hemorrhage, ischaemic cerebrovascular disease, multiple system atrophy, multiple sclerosis and brainstem tumors. Alcohol, medications (tricyclic antidepressants, hypnotic withdrawal,…) and sleep-related breathing disorders are also known triggers.

Treatment involves making safe the sleep environment to prevent potential injuries and practicising proper sleep hygiene; clonazepam has been reported to be 80-90% effective in preventing episodes.

Sleep-related Epilepsy Syndromes

Epilepsy is an organic brain disorder characterized by recurrent unprovoked epileptic seizures. The latter are involuntary, often stereotypic, symptoms or signs produced as a result of abnormal paroxysmal cortical

discharge. The sequence of symptoms and signs of these seizures depend on the symptomatogenic cortical zone(s) involved. Consciousness may or may not be impaired.

Sleep affects epilepsy in several aspects. Early observations that seizures in some individuals tended to occur in the night (and at particular times in the night) have been supported by the advent of the

electroencephalogram's (EEG) finding of increased epileptiform activity during NREM sleep with the reverse occurring in REM sleep.

Primary generalized grand mal seizures that occur in sleep invariably occur from NREM sleep. Individuals with juvenile myoclonic epilepsy have increased myoclonic seizures upon awakening (longer duration seizures from NREM sleep). Spasms in West's syndrome also tend to cluster around sleep-wake transition. Interictal discharges are abundant throughout sleep (in some cases exclusively in sleep) in children with benign Rolandic epilepsy; these also have nocturnal focal clonic or tonic seizures with rare secondary generalization. Electrical status epilepticus during sleep (ESES) is a childhood condition characterized by generalized continuous spike and wave EEG discharges during slow wave sleep.

Sleep deprivation has been shown to trigger epileptic seizures though the mechanism of activation remains unclear.

Epilepsy itself can impact sleep. Wake after sleep onset time (WASO), sleep stage shifts and sleep fragmentation occur in individuals with epilepsy. Type and severity of seizures in individuals with epilepsy also affect subjective disordered sleep complaints and findings on the polysomnogram.

With the myriad of movement disorders seen in sleep, the differentiation between more benign ones and those associated with more sinister conditions remains a challenging yet rewarding exercise. The following table summarizes the main diagnostic caveats between NREM parasomnias, RBD and sleep-related seizures.

	Seizure	NREM Parasomnia	RBD
Eyes	Open	Half-open/Closed	Closed
Movements	Stereotypic; Anatomical progression	Inappropriate, semi-purposeful	Concordant with dream content
Speech	Simple Vocalization	Inappropriate	Concordant with dream content
Duration	<1 – 2 min	Several mins	Several mins
Heart rate	Increased	May be increased	Usually normal
Event recall	Possible	No	Yes
Dream recall	No dreams	No dreams	Vivid