How to approach Parasomnia in adult

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Introduction: Normal sleep cycle

• Sleep consists of two strikingly different states:
  • Rapid eye movement sleep (REM)
  • Non-rapid eye movement sleep (NREM), alternate in cyclical fashion

• Sleep begins with a “shallow” Stage 1 of NREM and “deepens” to NREM Stages 2, 3, and 4, followed by first brief episode of REM ~ 90 minutes

• After the first sleep cycle, NREM and REM sleep continue alternating in cyclical fashion, duration of each cycle ~ 90 minutes

• Stages 3 and 4 of NREM sleep predominate during first third of the night.
  • REM sleep episodes become longer,
  • Longest REM periods found in last third of the night
Introduction: Parasomnia

• Parasomnias, defined undesirable behavioral, physiological, or experiential events that accompany sleep

• Common in general population

• Occur more frequently in children than in adults with exception of REM sleep behavior disorder (RBD), more common in men over 50

Introduction: Parasomnia

• Parasomnias can arise from any state of sleep (REM and NREM) as well as sleep-wake transitions

• Classified into distinct syndromes on this basis

• Disorders of arousal, for example, most prevalent of the NREM parasomnias
  • Typically, disorders of arousal occur during first third of the night, during deep sleep is most abundant

• REM sleep parasomnias more likely to emerge during later portion of sleep period, when REM sleep abundant
Parasomnia

- NREM – related
  - Sleep walking/talking
  - Sleep terrors
  - Rhythmic movement disorder

- REM
  - REM behavior disorder
  - Nightmare disorder

- Other
  - Sleep-related dissociative disorders e.g. Sleep binge eating, Sleep enuresis, sexomnia
  - Head banging
  - Sleep Groaning

NREM Parasomnias

- Young adults
  - +ve history of childhood sleep walking
  - Re-emergence in adulthood

- Psychological or physical trauma
- Sleep restriction
- Sleep history
  - First 1 – 1.5 hours
  - Difficult to arouse
  - Poor, or no dream recall

- Special cases
- Complex dissociative behaviors
  - Sleep sex, sleep eating
Differential Diagnosis of Parasomnias

- Nocturnal epilepsy
  - Nocturnal Frontal Lobe Epilepsy
  - Temporal Lobe Epilepsy/Complex Partial

- Seizures
  - Severe sleep apnea
  - Malingering

Parasomnias and sleep stages

<table>
<thead>
<tr>
<th></th>
<th>Sleep terrors</th>
<th>Sleepwalking</th>
<th>Nightmares</th>
<th>REM-Sleep Behavior Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Stage</td>
<td>Usually III, IV</td>
<td>III, IV</td>
<td>REM</td>
<td>REM</td>
</tr>
<tr>
<td>Most likely time of night</td>
<td>First third of sleep period</td>
<td>First third of sleep period</td>
<td>Final third of sleep period</td>
<td>Final third of sleep period</td>
</tr>
<tr>
<td>Age group</td>
<td>Children</td>
<td>Children</td>
<td>20-40% of children</td>
<td>Older men</td>
</tr>
<tr>
<td>Family history</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Violence</td>
<td>If attempt to arouse sleeper</td>
<td>Possible, e.g. homicidal somnambulism</td>
<td>Possible</td>
<td></td>
</tr>
<tr>
<td>Amnesia for event</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Confusion</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>May progress to sleepwalking</td>
<td>Yes</td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Terminated by</td>
<td>Returning to sleep</td>
<td>Returning to bed/sleep</td>
<td>Usually awaken the sleeper</td>
<td></td>
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</tbody>
</table>
Confusional arousal

• Subject awaken partially exhibiting marked confusion, slow mentation, disorientation and perceptual impairment, error of logic

• Common in children < 5 yrs

• Prevalence in the 15 to 24-year-old population 6%, age of 65 is 1%

• Result from partial or incomplete arousal from deep sleep, typically during first third of the night

• Typically last from 1 - 10 minutes, and are followed by retrograde amnesia for the event

• Precipitating factors i.e. fever, CNS depressants, recovery from sleep deprivation

Confusional arousal

• Pathophysiology
  • Incomplete awakening from sleep, leading to prolongation of normal period of sleep inertia

• DDx
  • Sleep walking
  • Sleep terrors
  • RBD
  • Nocturnal seizures

• Treatment:
  • Benign and require no treatment
  • Interruption may lead to increased agitation and possible injury
Sleep walking (somnambulism)

- Series of complex behaviors that are initiated during slow-wave sleep and results in walking during sleep
- Arousal from deep sleep (1st third)
- Without awakening: exhibition of wide range, complex autonomic behaviors
- Typically, sits up in bed during first third of the night, looks around with a blank stare, and exhibits some repetitive motor automatisms, such as picking at clothes or linens, gets up and walks around the bedroom, enters other rooms, and may even leave the house
- May cause injury
- Duration 1-5 minutes, > 1 hr when behaviors are more complex

Sleep walking (somnambulism)

- Sleepwalking episodes typically last less than 15 minutes;
  - Episodes lasting more than one hour have been reported
- Attempts to awaken a sleepwalker usually fail to produce arousal and may lead to aggressive and violent responses
  - Cases of sleepwalking violence, including homicidal somnambulism, have been described
- 40 percent of children experience at least one sleepwalking episode during childhood
  - 2 - 3 percent of children sleepwalk more than once per month.
  - 2 - 3 percent of adults in general population sleepwalk
Sleep walking

• Hybrid attack: sleep terror precedes and evolves into sleep walking

• Upon awakening patient may exhibit mental confusion and amnesia

• Most common in children 4-5 yrs, associated with strong family history

Sleep walking

• Precipitating factors
  • Sleep deprivation, stress, pain, OSA, distended bladder
  • Alcohol – SWS inc --- Inc sleep walking

• DDX
  • RBD
  • Confusional arousal
  • Sleep related seizures with ambulatory automatisms
Sleep walking

- Treatment
  - Safety
  - Avoid precipitating factors
- Medication
  - Benzodiazepines

Sleep terror (Parvor nocturnus, incubus attacks)

- Sudden arousals from deep sleep
- Scream / terror / confusion
- Extreme autonomic arousal
- Variable motor activity
  - Include extreme agitation / escape behavior
  - May result in injury during the episode
- Clinical
  - Patient wakes up, sits, emits, scream in a state of terror, difficulties breathing, palpitations and amnesia
Sleep terror (Parvor nocturnus, incubus attacks)

- Prevalence 3% of children, 1% of adults, Male > Female

- DDX
  - Nightmare (REM sleep)
  - Nocturnal seizures (frontal lobe epilepsy)

- Treatment
  - Often unnecessary if episodes are rare
  - DZP, Clonazepam, TCA
  - Psychotherapy, stress reduction, hypnosis

Sleep-related eating disorder (SRED)

- Features of parasomnia (sleepwalking, partial arousals) combined with characteristics of binge eating disorder

- During these episodes, individuals confused, not fully awake, and display variability in degree of awareness of their behavior

- Accurate recollection of event is absent, and individuals report “half-asleep.”
Sleep-related eating disorder (SRED)

• SRED frequently have prior histories of sleepwalking with later onset of eating at night

• Sleep-related eating disorder differentiated from condition night eating syndrome
  • Individuals with night eating syndrome consume meals during night hours while being fully awake

• Prevalence of SRED estimated 1-5% in adult population, women affected 2 to 4 times more frequently than men

Sleep-related eating disorder (SRED)

• Treatment of sleep-related eating disorder

• Mitigating precipitating sleep disorders, such as
  • Obstructive sleep apnea syndrome, periodic limb movement disorder, or restless legs syndrome

• Combinations of dopaminergic agents, opiates, and trazodone, as well as topiramate have been used with some success
**Sexsomnia**

- Patients exhibiting complex sexual behaviors during sleep
- It is unclear whether sexsomnia is distinct parasomnia or a variant of sleepwalking
- Some features of this parasomnia distinct from sleepwalking:
  - Behaviors involve sexual partners, individuals exhibit sexual arousal, and more prominent autonomic activation, and some form of dream mentation is present

**REM Sleep Parasomnia**

- REM-_SLEEP BEHAVIOR DISORDER
- NIGHTMARES
- HYPNOLOGIC/ HYPNOPOMPIC HALLUCINATIONS
REM Behavior Disorder

- REM-sleep behavior disorder (RBD) is best studied REM sleep parasomnia

- Prevalence of violent behavior associated with RBD is 0.5 percent in the general population.

- REM sleep behavior disorder more common in elderly
  - Age of onset is typically between 50 - 60 years old
  - Men affected more frequently than women, many individuals there may be a subclinical prodromal state.

- Mechanism responsible for normal skeletal muscle atonia is not functioning properly and individuals act out their dreams
  - Lesions and malfunctions in brain stem are believed to be responsible for the lack of skeletal muscle atonia during REM sleep.

REM Behavior Disorder

- Injurious or disruptive behaviour during sleep

- Easily aroused; Dream recall prominent

- Two-thirds of patients develop Parkinson's disease
  - Mean latency of 13 years; associated with synucleinopathies (PD, LBD, MSA)

- Polysomnography diagnostically helpful

- Highly responsive to Clonazepam
RBD in Parkinson’s disease

- RBD may be heralding manifestation of PD by many years
- RBD occur 15-50% of patient with PD

REM Sleep behavior disorder

- Characterized by complex vigorous motor activities and injurious behaviors representing attempts of vivid, action filled violent dreams
- Occur at least 90 minutes after sleep onset and predominantly in the 2nd half of the night
- Risk for injury-self and bed partner
REM Sleep behavior disorder

- Wide range of behaviors
  - Verbalizations
  - Singing
  - Yelling, shouting, screaming
  - Walking, running
  - Punching, kicking, jumping
  - Violent / agitated behaviors

REM Sleep behavior disorder

- Clinical feature (Olson EJ et al Brain 2000)
  - 93 cases, M 87%; F 13%
  - Mean age of onset 61 yrs
  - Mean age of diagnosis 64 yrs
  - Injuries to self/bed partner 32%/16%

- Diagnosis:
  - suspected clinically, confirmed by PSG
Acute reversible RBD

- Acute RBD most commonly associated with
  - Withdrawal from alcohol, benzodiazepines, and barbiturates,

- Administration of some psychiatric medications
  - Tricyclic antidepressants
  - Selective serotonin reuptake inhibitors
  - Cholinergic agents
  - Monoamine oxidase inhibitors

- Behaviors in individuals with acute RBD include limb and body jerking, kicking the bed, shouting, and striking bed partners
REM Behavior Disorder

REM Sleep behavior disorder

- DDX
  - Sleep walking
  - Sleep terrors
  - Nocturnal seizures
  - Sleep talking
  - PLM
REM Sleep behavior disorder

- Treatment
  - Avoid potential aggravated Rx
    - SSRI, Selegiline, Clomipramine, Anticholinergic, TCA, MAOIs
  - Prescribed Clonazepam 0.25-1 mg hs (90% effective)
  - Bupropion should be the antidepressant of choice in patients with RBD,
  - Melatonin
  - Levodopa, dopamine agonists
  - AEDs

Nightmares

- Frightening dreams or disturbing mental experiences, usually awaken sleeper from REM sleep

- Dream content most frequently involves imminent danger; attacks or pursuit are common themes

- Fear and/or anxiety most frequent emotions associated with nightmares; sadness, anger, and dysphoria also frequently reported

- Nightmares not associated with confusion or disorientation
Nightmares

• More prevalent in childhood;
  • Prevalence in children is 20 to 40 percent
  • 5 to 30 percent of children report having often nightmares “often or always.”
  • In adults, prevalence having one or more nightmares per month ranges from 8 to 30 percent

• Multiple classes of drugs may trigger nightmares

• Withdrawal from REM-suppressing medications, such as
  • Selective serotonin reuptake inhibitors, tricyclic antidepressants, hypnotics, and alcohol, beta blockers and dopaminergic agonists may precipitate nightmares or increase the severity of nightmares

Nightmares

• Treatment includes
  • Psychotherapy,
  • Minimizing or avoiding stress,
  • Minimizing the use of drugs that may precipitate nightmares

  • In individuals with poor sleep hygiene, instituting a regular sleep-wake pattern

  • Pharmacotherapy
    • Cyproheptadine 4 to 16mg
    • Prazosin 5 to 10mg helpful in Rx nightmares
Hypnogogic and hypnopompic hallucinations

- Hypnogogic and hypnopompic hallucinations are vivid perceptual experiences
- Occurring at the onset (hypnogogic) of sleep or upon awakening (hypnopompic)
- Thought to result from intrusion of REM sleep process into the waking state.
- Hallucinations most frequently visual, but can be auditory, tactile, or cenesthotaptic (abnormal sensations)

Hypnogogic and hypnopompic hallucinations

- Visual hallucinations range from poorly formed shadows, shapes, or colors to well formed complex images
- Individuals report seeing circles, shadows, faces, persons, and animals in the room
- Images may be constant or changing in size, black and white, or in color
Hypnogogic and hypnopompic hallucinations

- **Auditory hallucinations** may include indistinct sounds, threatening sentences, or complex melodies.

- **Cenesthopathic hallucinations** include changes in body part location and extracorporeal experiences.

- Hallucinations can be pleasing or frightening; eventually individuals learn that images are not real and disappear after a few minutes.

- Occasionally, individuals with hypnagogic or hypnopompic hallucinations are misdiagnosed as having psychotic disorders.

Somniliquy

- Speech during sleep

- Not complex

- Not associated with subjective awareness of talking

- Not sleep stage specific
Hypnic jerks

- Brief body jerks in isolation / succession
  - Exclusively during sleep onset
  - Leg > arm & head
  - Sensory symptoms: flashing lights, feeling of falling, hypnagogic hallucinations

- Etiology
  - Nicotine, caffeine, stress, exercise

Bruxism

- Prevalence 5-10%

- Uncertain relationship to stress

- Associated with any sleep stage

- Consequence primary dental pathology

- PSG
  - Phasic increase in masseter muscle tone, rythmic EMG artifacts in the EEG, freq 0.5-1.5 Hz occurring in bursts at stage I, II, REM

- Treatment
  - Stress reduction, mouth guard, BZD
Periodic Limb Movements of Sleep

In summary: Approach to patients with Parasomnia

- It is essential to interview both the patient and patient’s bed partner
  - Because often patients with NREM parasomnia may be unaware of their activities at night
  - Ask about childhood and family history of parasomnias
  - Ask about time of night when symptoms occur and whether the patient recalls associated dreams
  - Neurologic exam is advisable
In summary: Approach to patients with Parasomnia

- All patients with adult onset parasomnias (NREM and REM) need to be referred to sleep specialist for an evaluation

- The evaluation include **nocturnal polysomnographic study**, and sleep specialist will determine whether patient needs MRI brain or neurologic work up

- When parasomnias lead to injury or psychological distress to patient or bed partner, result in law breaking, impair functioning due to excessive daytime sleepiness, cause weight gain, referral to sleep specialist for evaluation and treatment

In summary: Parasomnia

- Parasomnias common in general population

- Clinical phenomena arise as brain transitions between REM sleep, NREM sleep, and wakefulness

- Parasomnias can be accurately diagnosed and effectively treated
In summary: Parasomnia

• Certain parasomnias may signal onset of serious medical disorders

• In most cases, adhering to good sleep hygiene measures,
  • Avoiding sleep deprivation, treating primary sleep disorders, reducing stress, and ensuring patient safety

  • When episodes frequent, cause distress, and/or impose danger to patient or their bed partner
    • Effective pharmacotherapeutic measures