The Interesting Story of Parasomnias

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Disclosures

• I have no relevant personal financial relationships with any commercial interests

• If at any time during this talk I discuss an off-label/investigative use of a commercial product/pharmaceutical/device, I understand that I will provide disclosure either verbally or in writing
Objectives

• Review the “story” of parasomnias
• Define different parasomnias in children and teens in both REM and NREM sleep
• Understand the relationship of specific parasomnias to other pediatric sleep disorders such as OSA and periodic limb movements
Parasomnias - definition

• Undesirable physical events that occur during entry into sleep, within sleep, or during arousals from sleep
  • Can include:
    – movement
    – behaviors
    – emotions
    – perceptions
    – dreaming
    – autonomic nervous system functioning

• Reference: The International Classification of Sleep Disorders, 3rd edition
PARASOMNIAS

NREM sleep RELATED

• Confusional Arousals
• Night Terrors / Sleep Terrors
• Sleepwalking
• Sleep Related Eating Disorder

REM sleep RELATED

• Nightmare Disorder
• REM Sleep Behavior Disorder
• Recurrent Isolated Sleep Paralysis

OTHER

• Sleep Enuresis
• Exploding Head Syndrome
• Sleep Related Hallucinations
• Sleep Talking
Parasomnias

• State dissociation
• Certain areas of the brain are deactivated (Sleep) and others remain activated (Wake)
• NREM parasomnias are usually not associated with identifiable “neuropathology” compared to REM related behaviors
  • REM related pathology can be associated with other neurologic concerns, ie Parkinson’s disease
• Also contrasts with the “rhythmic movement disorders” like body rocking, head banging, bruxism which are usually single simple motor driven behaviors
So what is “the story”

• HISTORY is a key element for evaluation of parasomnias
• Timing and description of the events – video is very helpful
• Does child leave the bed or room?
• Recall or amnesia of the event
• Occurrence during daytime naps
• Presence of daytime sleepiness and sleep routine
• Stereotypic movements or rhythmic behaviors
• Evidence for sleep-disordered breathing
• Sleep environment
Typical Sleep Pattern

Disorders of Arousal / NREM

- Recurrent episodes of *incomplete awakenings* from sleep
- **Inappropriate or absent responsiveness** to efforts of others to intervene or redirect the person
- Limited or no associated cognition or dream imagery
- Partial or complete *amnesia* for the episode
- The disturbance is not better explained by another sleep disorder, mental disorder, medical condition, medication, or substance use
- **First third of the sleep period**
- **Individuals appear confused and disoriented for several minutes or longer**
Confusional Arousals

• Occur at any age but more prominent in infants, toddlers, and preschoolers
• Transition from stage 4 to REM sleep
• Gradually begin with thrashing but then may have periods of crying out
• Can last from 5-40 minutes
• Prevalence in children (3-13 yo) in one study was 17%
• Can often progress to sleepwalking
Sleep Terrors / *Pavor Nocturnus*

- Disordered arousal from stage 3 or 4
- Usually age 4-12 yo
- Pallor, sweating, pupil dilation, piloerection, tachycardia, screaming
- Not responsive and amnestic to the event
- 3% of children, 1% of adults (in children <5yo, 25% is reported)
- Often with family history
Findings on PSG

• High amplitude Hypersynchronous delta waves
• Frequent arousals from slow wave sleep
• Often do not get much extended video information, ie rare to get out of bed
• To be used to rule out other pathology – ie OSA, PLMD, epilepsy, RBD
A 30-second polysomnographic tracing showing an arousal arising from sleep stage N3 (slow-wave sleep) (red arrow), showing hypersynchronous slow-wave activity and increase in muscle tone followed by normal wakefulness.

Irfan M, Schenck C, Howell MJ. Non-rapid eye movement sleep and overlap parasomnias, Continuum(Minneap Minn) 2017;23(4):1035-1050
Sleep Terrors vs. Nightmares

• **Sleep Terrors**
  • Occur in first 1/3 of night
  • Resists intervention / appears confused
  • Rapid return to sleep for child
  • Amnestic to event
  • NREM, slow wave sleep
  • High autonomic nervous system discharges

• **Nightmares**
  • Occur in last 1/2 of night
  • Interactive / able to be comforted
  • Difficult for child to return to sleep
  • Memory of event
  • REM sleep
  • Mild autonomic nervous system activity
"The golden arches! The golden arches got me!"
Sleepwalking / Somnambulism

• Occurs during stage 3 / 4 of NREM sleep
• In preschool or school age children, rare to start as teen/adult
• Show no agitation
• Difficult to arouse, uncoordinated, wander in illogical places
• Amnestic to event in AM
• Lifetime prevalence of sleepwalking is 18%, up to 4% of adults sleepwalk
• Genetics: 22% rate in child if no parents with sleepwalking, 45% with one parent, 60% if both parents
Nocturnal seizures

• Timing of events is variable / often at sleep onset or sleep-wake transition
• Variable autonomic arousal
• Stereotypic or repetitive behavior is common
• Usually awake and confused after event
• Often daytime sleepiness
• No recall
• Rare
Sleep related epilepsies

- Benign rolandic epilepsy / BECTS
- Electrical status epilepticus of sleep
- Juvenile myoclonic epilepsy
- Landau-Kleffner syndrome
- Nocturnal frontal lobe epilepsy
BECTS – Benign epilepsy with centro-temporal spikes (BECTS)
Nocturnal Frontal Lobe Epilepsy

• Abrupt often explosive onset awakening patient from NREM 2 sleep
• Sustained asymmetric dystonic or tonic posturing, violent hypermotor behaviors, thrashing, pedaling, and/or kicking of the lower extremities
• Often accompanied by loud vocalizations and look of fear

Grigg-Damberger, MD Pediatric Annals, 2008, 37:7
Frontal lobe epilepsy

Triggers for NREM partial arousals

- Stress
- Fever and illness
- Sleep deprivation
- Irregular sleep schedule
- Medications (antihistamines, stimulants, etc)
- Physical activity
- Alcohol
- Bladder distension
- Other sleep disorders ("a sleep disorder within a sleep disorder")
Treatment

• Reassurance / education
• Safety
• Sleep hygiene
• Behavioral management
• Screen for other sleep disorders
• Pharmacologic treatment
• Scheduled awakenings
Sleep Hygiene Principles

• Relatively dark quiet sleep environment
• Soothing bedtime routine
• Teach the child the skill of falling asleep on his or her own
• Avoid changing the routine
• NO TV in room
• Avoid stimulation before bedtime
• Adequate amount of sleep
• Avoid caffeine
Pharmacologic interventions

• Short acting benzodiazepines (diazepam) for 3-6 months
  • Suppresses slow wave sleep in first third of night
  • May experience rebound when stopping meds
• Tricyclic antidepressants have also been used
Scheduled awakenings

• Awake the child 15-30 minutes prior to the time of the night that the episode is to occur
• Need to do this for up to 2-4 weeks
• Can use an extinction method if withdrawal is not successful
HOW IT WORKS.

The Sleep Guardian 2 takes a time-tested approach to night terror prevention and fits seamlessly into your life.
Differential diagnosis

• Seizures
• Cluster headaches
• Conditioned arousals
• Post-traumatic stress disorder
• Nocturnal panic attacks
• Nightmares
• Rhythmic movements of sleep
• REM sleep behavior disorder
When to have further evaluation

• Injurious or violent behavior
• Events are extremely disruptive to other household members
• Excessive daytime sleepiness
• Unusual clinical presentation not characteristic of parasomnias
• Association with medical, psychiatric or neurologic symptoms or findings
• Nightly events may also trigger eval
One story

• 3 year old girl with recurrent night terrors that parents discussed at routine check up
• Night terrors happen about an hour after she falls asleep
• Going on for the last year
• Happening almost nightly
• Medical history significant for recurrent ear infections s/p PE tubes
• Parents brought up that she is also snoring
Another story

• 8 yo boy with history of asthma that is well controlled
• Mother concerned because of sleepwalking
• Rare night terrors as toddler
• Beginning around kindergarten had a couple episodes of sleepwalking but over the summer, started to have episodes a couple times a week
• Wanders into closet or out into living room
• Hasn’t been hurt
• Rare snoring
One final story

• 8 yo boy presenting with recurrent severe “night terrors” for the last 2 years
• Nightly bedwetting
• Diagnosed with ADHD last year but “no response” to medications
• Parents report that his night terrors happen at “any time of the night” and often occur multiple times during the night.
  • The first night terror can occur as soon as 30 minutes after going to sleep.
  • They often hear him “kicking the wall” even in the early morning around 3-4 am.
  • Patient does not recall any of the events in the morning.
  • The parents usually don’t observe the events at night because he just calls out or screams.
• Very difficult to wake up during the morning
• No snoring
• Some mornings they actually find him sleeping on the floor of his bedroom so they wonder if he has fallen out of bed
Nightmare disorder

• Vivid dreams with intense feelings of terror or dread
• Nightmares can occur in any stage of sleep but typically the more complex storylines and frightening content is associated with REM sleep
• In childhood, boys and girls are equally affected; in adulthood, more common in women
  • Very common in childhood but not “frequent”
• To meet criteria for “disorder” causes distress or an impairment in functioning
Nightmares

• Treatment
  • Reassurance / education
  • Sleep hygiene
  • Reduce stressors
  • Security object, nightlight
  • Relaxation techniques
  • Exposure and desensitization
  • Rescripting and imagery rehearsal
“What to Do When You Dread Your Bed”

• A Kid’s Guide to Overcoming Problems with Sleep
• By Dawn Huebner, PhD
• Chapters on:
  • Recommended sleep amount
  • Bedtime routine
  • Bedtime passes
  • Relaxation
  • Bad dreams
  • Busy brains / relaxing your body
Sleep Paralysis

• Inability to move the trunk and all limbs at sleep onset or on waking from sleep, spares diaphragm and extraocular muscles
• Conscious and awake during event but feels paralyzed
• Lasts seconds to minutes
• Can be normal but also associated with narcolepsy
• Provoked by sleep deprivation or change in sleep routine
• Prevalence range is wide – 15-40% of at least one episode
• Age of onset is often teenagers
REM Sleep Behavior Disorder

• Usually occurs in adults but cases have been seen in childhood
• Elaborate purposeful movements during REM sleep – “acting out dreams”
• Paradoxical increase in muscle tone in REM- REM sleep without atonia
  • Often can have PLM’s during NREM sleep
• Injury to patient or others is common (but not as common for pediatric patients)
• Usually idiopathic but in adults 40% are associated with a neurologic disorder
• Walking is uncommon and eyes are usually closed
Parasomnia overlap disorder

• Patients have BOTH RBD and another sleep disorder
  • Disorder of arousal (NREM), rhythmic movement disorder, sleep related eating disorder

• Can be idiopathic or associated with narcolepsy-cataplexy (narcolepsy type 1), brainstem tumor, brain trauma, antidepressants
Other Parasomnias

- Sleep enuresis
- Sleep talking
Nocturnal Enuresis / Bedwetting

• Definition: involuntary voiding during sleep at least 2 times/week for at least 3 months past the age of 5 years

• Primary vs. Secondary

• Monosymptomatic vs. Polysymptomatic

• Major factors
  • Volume or diuresis-dependent patients
  • Involuntary detrusor contractions with small bladder capacity
  • Decreased arousability

• Multiple other factors – genetics, infection, anatomical variants, constipation, stress, abuse, caffeine, OSA
Sleep Talking

• “Talking” during sleep
• REM or NREM
• Lifetime prevalence across ages of 66%
• In the last 3 months, 17%
• Can be associated with RBD

• Need to differentiate between catathrenia / nocturnal groaning, nocturnal seizures, sleep apnea
Primary parasomnias related to phase of sleep

• **When going to sleep**
  • Sleep starts
  • Hypnagogic hallucinations
  • Sleep paralysis

• **Early in the night in deep NREM sleep**
  • Confusional arousals
  • Sleepwalking
  • Sleep terrors
Primary parasomnias related to phase of sleep

• Later in the night in REM sleep
  • Nightmares
  • Idiopathic REM sleep behavior disorder

• When waking up
  • Hypnopompic hallucinations
  • Sleep paralysis

• Various times of the night
  • Sleeptalking
  • Nocturnal enuresis
Red Flags of “Atypical Parasomnias”

• >2-3 attacks per week
• Spells are relatively stereotyped
• Spells occur just after sleep onset or frequently occur in 2nd half of night
• Multiple episodes per night, not just within 3 hours of sleep onset
• Later childhood or adult onset
• Potentially injurious or caused injury to themselves or others
• Failure of conventional therapy
• Excessive daytime sleepiness
• Impaired daytime functioning

Grigg-Damberger, MD Pediatric Annals, 2008, 37:7
Conclusions

• Parasomnias as a whole are extremely common in pediatrics
• Most are benign but some deserve further evaluation especially for other co morbid sleep disorders
• A complete history and physical can be very helpful in determining which cases need further evaluation
The monster snorkel: allows your child to breathe comfortably without exposing vulnerable parts to an attack.
References

• International Classification of Sleep Disorders, 3rd edition, American Academy of Sleep Medicine, 2014

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