Gillette Welcomes New Sleep Health Specialist

Laurel Wills, M.D.

Laurel Wills, M.D., is a specialist in pediatric and adolescent sleep medicine, with a particular focus on caring for children and youth who have developmental disabilities.

After receiving her medical degree from Boston University School of Medicine, Wills completed her pediatric residency at the University of Chicago Medical Center and La Rabida Children’s Hospital in Chicago. She went on to finish her fellowship in developmental and behavioral pediatrics, including training in pediatric sleep medicine, at Children’s Hospital in Boston. Wills is board-certified in general pediatrics, developmental-behavioral pediatrics, and sleep medicine. Her professional memberships include the American Academy of Pediatrics and the American Academy of Sleep Medicine.

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Sleep Terrors or Nocturnal Frontal Lobe Epilepsy?

by John Garcia, M.D., and Nicole Williams, M.D.

Introduction

Differentiating sleep terrors from nocturnal seizures can be challenging. In both instances, patients seem suddenly from non-REM sleep, may scream, appear agitated, and move their arms and legs. However, there are important differences to look for when making a diagnosis.

Sleep Terrors

Sleep terrors (also called “night terrors”) are one example of a disorder of arousal, a common type of parasomnia. Other examples include everything from calm sleepwalking to emotionally agitated or complex behaviors such as dressing or eating while asleep. Up to 17 percent of preschool-aged children experience disorders of arousal1.

As its name suggests, during a disorder of arousal the person is only partially awake. Classic sleep terrors occur in the first half of the night, usually in the first 60 to 90 minutes of sleep, and the child can return to deep non-REM sleep. Typically, the child has no memory of the sleep terror episode.

Children experiencing sleep terrors may display some or all of these symptoms: disorientation, emotional outbursts, such as screaming and the appearance of fear, motor activity, such as fast or slow movement and pubertal or autonomic discharges, such as flushing, sweating and tachycardia. Because of the intensity of activity during sleep terrors, patients can unintentionally hurt themselves or others during the episode. The duration of the episodes varies, and each episode usually ends abruptly, with the child returning to a deep sleep. Typically, sleep terrors decrease in frequency and dramatic nature as the child gets older and children usually outgrow them by the time they reach school age.2

Diagnosis

Clinical evaluation is sufficient; polysomnograms and video electroencephalograms (VEEGs) are typically not required. When evaluating a child for sleep terrors, it is important to ask if the episodes occur shortly after the onset of sleep or later in the night. Another consideration is the age of the child, because sleep terrors usually affect young children and would not be as common in a school-aged child. Additionally, ask parents if the child has a history of daytime sleep spells or seizures, unusual posturing, limb jerking, or a change in skin color during the episodes. If the parents observe any such daytime symptoms in addition to sleep terrors, consider a neurodevelopmental or mental disability, consider a video EEG to establish or rule out seizures.

Treatment Options

Be sure that parents who sleep terrors are common and that most children outgrow them by the time they are school-age. Recommended that parents intervene as gently as possible. For example, parents should try not to wake them. Instead, they should simply guide the child back to bed and help settle him or her. If the child sleepwalks, recommend safety precautions such as securing windows, putting a gate at the top of stairs, and adding a motion detector alarm in the child’s bedroom door to alert parents that the child is sleepwalking. If the sleep terrors are particularly dramatic and nocturnal seizures have been ruled out, consider prescribing a low dose of clonazepam at bedtime.

Nocturnal Frontal Lobe Epilepsy

Description

Nocturnal Frontal Lobe Epilepsy (NFE) is characterized by frontal lobe seizures that occur primarily during sleep and may mimic disorders of arousal previously the patient behavior is agitated. Both sporadic and familial forms of NFE exist. Although the syndrome’s typical onset occurs between 7 and 12 years, NFE has been documented in patients from infancy to adulthood.

During a NFE seizure, patients often exhibit behaviors that resemble sleep terrors:
• Sudden, explosive arousal from non-REM sleep, often within 30 minutes of falling asleep
• Vocalizations, including screaming or laughing
• Arm and leg movements, such as lunar posturing (one arm extended while the other flexes); kicking or bicycling pedaling motions of legs; rocking, pelvic thrusting; or tonic stiffening of the limbs
• Returning to sleep immediately after the seizure

1http://www.gillettechildrens.org/epilepsy
2http://www.gillettechildrens.org/epilepsy
3http://www.gillettechildrens.org/epilepsy

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Nocturnal Frontal Lobe Epilepsy

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2. A Pediatric Perspective

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By John Garcia, M.D., and Nicole Williams, M.D.
Conclusions

Epilepsy surgery or a vagus nerve stimulator may be considered in cases of epilepsy resistant to medication. Comprehensive multidisciplinary evaluation is necessary to properly diagnose and treat these children.

References


Case Study – Nocturnal Frontal Lobe Epilepsy

History

After an 11-year-old boy experienced a first generalized convulsive seizure, his parents brought him to a neurologist for evaluation. The seizure occurred at school and lasted five to 10 seconds. A routine EEG performed prior to the visit was normal.

Evaluation

When questioned further, the patient’s parents reported that he had had no further daytime seizures. However, his nocturnal seizures remained. Although they had decreased somewhat in frequency, the dose of clobazam was increased with no further improvement in nocturnal seizure control. Therefore, lamotrigine was added and his nocturnal seizures disappeared.

Treatment

Carbamazepine was started. At a two-month follow-up appointment, the patient’s parents reported that he had had no further nocturnal seizures. However, his nocturnal seizures remained.

Case Study – Sleep Troubles

History

The parents of a 3½-year-old boy brought their son to Gillette’s Sleep Health Clinic for an evaluation of his sleep difficulties. They described a history of nearly nightly episodes in which their son would seem to wake up screaming within 60 to 90 minutes of falling asleep. When they entered his room, they would find him sitting up in bed with his eyes open, yet he would not recognize his parents. He often would be screaming, breathing fast and looking panicked. The episodes usually lasted less than 15 minutes and ended as abruptly as they began. The following day, the patient would have no memory of the episode. The family learned that if they did not try to wake their child or comfort him, the episodes were shorter. The patient’s parents said they became so accustomed to the episodes that they could “set their watch” by them. Because of the frequency of the episodes, the parents learned to delay their own bedtime so they could resettle their son first.

Evaluation

When questioned further, the parents said the child’s bedtime ranged from 8:30 to 10:30 p.m., which indicated he was not getting enough sleep. The establishment of a more regular bedtime to decrease the son’s sleep deprivation and help prevent episodes. As a result of these steps, the frequency of the night terrors went from nearly nightly to a very tolerable once or twice a week. No medication was required. One year later, the patient’s son experienced a 14-night stretch of sleep terrors when school started because he was not getting enough sleep. The establishment of more regular bedtime to decrease the number of episodes.

Frontal Lobe Epilepsy Scale (FLEP)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sleep Troubles</th>
<th>Nocturnal Frontal Lobe Epilepsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of onset</td>
<td>&gt; 55 years</td>
<td>&gt; 55 years</td>
</tr>
<tr>
<td>Duration</td>
<td>&lt; 5 minutes</td>
<td>&lt; 5 minutes</td>
</tr>
<tr>
<td></td>
<td>5-10 minutes</td>
<td>5-10 minutes</td>
</tr>
<tr>
<td></td>
<td>&gt; 10 minutes</td>
<td>&gt; 10 minutes</td>
</tr>
<tr>
<td>Number of events in a night</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td>3-5</td>
<td>3-5</td>
</tr>
<tr>
<td></td>
<td>&gt; 5</td>
<td>&gt; 5</td>
</tr>
<tr>
<td>Time of night</td>
<td>30 minutes of sleep onset</td>
<td>Anytime</td>
</tr>
<tr>
<td></td>
<td>Awake associated</td>
<td>Anytime</td>
</tr>
<tr>
<td></td>
<td>Wander outside bedroom?</td>
<td>Anytime</td>
</tr>
<tr>
<td></td>
<td>Complex behaviors?</td>
<td>Anytime</td>
</tr>
<tr>
<td></td>
<td>Pick up objects? Dress?</td>
<td>Anytime</td>
</tr>
<tr>
<td></td>
<td>Olfactory, gustatory, sexual symptoms?</td>
<td>Anytime</td>
</tr>
<tr>
<td>Stereotypic movement</td>
<td>Highly</td>
<td>Variable</td>
</tr>
<tr>
<td></td>
<td>Unclear</td>
<td>Unclear</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td>Variable</td>
</tr>
<tr>
<td>Recal?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Scores &lt; 0</td>
<td>Likely to be sleep terrors</td>
<td>Likely to be NFLE</td>
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<tr>
<td>Scores &gt; 0</td>
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Sleep Terrors vs. Nocturnal Frontal Lobe Epilepsy

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sleep Troubles</th>
<th>Nocturnal Frontal Lobe Epilepsy</th>
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<tbody>
<tr>
<td>Typical age of onset</td>
<td>Preschool</td>
<td>7-12 years</td>
</tr>
<tr>
<td>Number of episodes/night</td>
<td>1-2</td>
<td>1-20 or more</td>
</tr>
<tr>
<td>Behaviors</td>
<td>Moving arms and legs</td>
<td>Moving arms and legs</td>
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<tr>
<td></td>
<td>Stereotypic movement</td>
<td>Stereotypic movement</td>
</tr>
<tr>
<td></td>
<td>Walking around in the room</td>
<td>Walking around in the room</td>
</tr>
<tr>
<td></td>
<td>Vocational, sexual symptoms</td>
<td>Vocational, sexual symptoms</td>
</tr>
<tr>
<td></td>
<td>Recal</td>
<td>Recal</td>
</tr>
<tr>
<td></td>
<td>May have aura</td>
<td>May have aura</td>
</tr>
<tr>
<td>Progression</td>
<td>Usually progress into adulthood</td>
<td>Usually progress into adulthood</td>
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</table>

Sleep health

The clinical events were consistent with frontal lobe seizures, and the patient’s video EEG showed bursts of frontal lobe epileptiform discharges during the episodes — confirming NFLE.

Treatment

Carbamazepine was started. At a two-month follow-up appointment, the patient’s parents reported that he had had no further nocturnal seizures. However, his nocturnal seizures remained. Although they had decreased somewhat in frequency, the dose of carbamazepine was increased with no further improvement in nocturnal seizure control. Therefore, lamotrigine was added and his nocturnal seizures disappeared.

Case Study – Sleep Terrors

History

The parents of a 3½-year-old boy brought their son to Gillette’s Sleep Health Clinic for an evaluation of his sleep difficulties. They described a history of nearly nightly episodes in which their son would seem to wake up screaming within 60 to 90 minutes of falling asleep. When they entered his room, they would find him sitting up in bed with his eyes open, yet he would not recognize his parents. He often would be screaming, breathing fast and looking panicked. The episodes usually lasted less than 15 minutes and ended as abruptly as they began. The following day, the patient would have no memory of the episode. The family learned that if they did not try to wake their child or comfort him, the episodes were shorter. The patient’s parents said they became so accustomed to the episodes that they could “set their watch” by them. Because of the frequency of the episodes, the parents learned to delay their own bedtime so they could resettle their son first.

Evaluation

When questioned further, the parents said the child’s bedtime ranged from 8:30 to 10:30 p.m., which indicated he was not getting enough sleep. The establishment of a more regular bedtime to decrease the number of episodes.

Introduction

Epilepsy surgery or a vagus nerve stimulator may be considered in cases of epilepsy resistant to medication. Comprehensive multidisciplinary evaluation is necessary to properly diagnose and treat these children.

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Introduction
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Sleep Terrors
Description
Sleep terrors (also called “night terrors”) are one example of a disorder of arousal, a common type of parasomnia. Other examples include everything from calm sleepwalking to emotionally agitated or complex behaviors such as dressing or eating while asleep. Up to 17 percent of preschool-aged children experience disorders of arousal.

As its name suggests, during a disorder of arousal the person is only partially awake. Classic sleep terrors occur in the first half of the night, usually in the first 60 to 90 minutes of sleep, and the child usually awakes rapidly from deep non-REM sleep. Typically, the child has no memory of the sleep terror episode.

Children experiencing sleep terrors may display some or all of these symptoms: disorientation; emotional outbursts, such as screaming and the appearance of fear; motor activity, such as flushing, sweating and tachycardia; and discharges, such as kicking or bicycle-pedaling motions of legs; rocking; pelvic thrusting; or tonic stiffening of the infant and toddler years.

Because of the intensity of activity during sleep terrors, patients can unintentionally hurt themselves or others during episodes. During the duration of the episodes, each patient usually sits upright, with the child returning to a deep sleep. Typically, sleep terrors decrease in frequency and dramatic quality as the child gets older, and children usually outgrow them by the time they reach school age.

Diagnosis
Clinical evaluation is sufficient; polysomnograms and video electroencephalographic (EEG) recordings are typically not required.

When evaluating a child for sleep terrors, it is important to ask if the episodes occur shortly after the onset of sleep or later in the night. Another consideration is the age of the child, because sleep terrors usually affect young children and would not be as common in a school-aged child. Additionally, ask parents if the child has a history of daytime sleep spells or seizures, unusual posturing, limb jerking, or a change in skin color during the episodes. If the parents observe any such daytime symptoms, a consultation with a neurodevelopmental or mental disability, consider a video EEG to establish or rule out seizures.

Treatment Options
Because patients that sleep terrors are common and that most children outgrow them by the time they are school-age. Recommend that parents intervene as gently as possible. For example, parents should not try to wake up the child. Instead, they should simply guide the child back to bed and help settle him or her. If the child is sleepwalking, recommend safety precautions such as securing windows, putting a gate at the top of stairs, and adding a motion detector alarm in the child’s bedroom that will alert parents that the child is sleepwalking. If the sleep terrors are particularly dramatic, and nocturnal seizures have been ruled out, consider prescribing a low dose of clonazepam at bedtime.

Nocturnal Frontal Lobe Epilepsy
Description
Nocturnal Frontal Lobe Epilepsy (NFLE) is characterized by frontal lobe seizures that occur primarily during sleep and may mimic disorders of arousal. The patient’s behavior is agitated. Both sporadic and familial forms of NFLE exist. Although the syndrome’s typical onset occurs between 7 and 12 years, NFLE has been documented in patients from infancy to adulthood.

During a NFLE seizure, patients often exhibit behaviors that resemble sleep terrors:

• Sudden, explosive arousal from non-REM sleep, often within 30 minutes of falling asleep
• Vocalizations, including screaming or laughing
• Arm and leg movements, such as fencer posturing (one arm extended while the other flexes); kicking or bicycle-pedaling motions of legs; rocking; pelvic thrusting; or tonic stiffening of the limbs
• Returning to sleep immediately after the seizure

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Pediatric Speech and Language Conferences:
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Sleep Terrors or Nocturnal Frontal Lobe Epilepsy?

Garcia is a graduate of the University of Iowa School of Medicine. He completed a residency in pediatrics and one year of fellowship training in behavioral/developmental pediatrics at Riley Hospital for Children in Indianapolis. He then completed a sleep fellowship equivalent at the Minnesota Regional Sleep Disorders Center in Minneapolis. His professional associations include the American Board of Sleep Medicine and the American Board of Pediatrics.

Nicole Williams, M.D.
Pediatric Neurologist

Nicole Williams, M.D., is a board-certified pediatric neurologist who specializes in the care of children who have epilepsy, cerebral palsy, and developmental delays, particularly neurologic conditions that appear during the infant and toddler years.

Williams graduated from the University of Minnesota Medical School and completed a pediatric residency and a child neurology residency at Stanford University/Lucile Packard Children’s Hospital in Palo Alto, Calif. In addition, she completed elective clinical rotations in neonatal neurology at the University of California, San Francisco School of Medicine and pediatrics at LAMBS Hospital in Bangladesh. Her studies also included a course in designing clinical research at the University of California, San Francisco School of Medicine.

Nicole Williams, M.D.

Garcia is a board-certified sleep specialist, John Garcia, M.D., works with patients who have insomnia or other sleep disorders. Such disorders should be evaluated by a sleep specialist.

John Garcia, M.D.

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Pediatrics specialist

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Pediatrics specialist
Sleep terrors and NFLE seizures have some similarities. During clinical evaluation, several factors point to NFLE rather than sleep terrors: During motor seizures can obscure the EEG recording. EEGs by routine scalp electrodes, and frequent muscle artifacts because a large portion of the frontal lobe cortex is undetected. Experiencing NFLE are often inconclusive and uninformative, have normal CT scans and MRIs. Additionally, EEGs of patients because NFLE do not have an aura and parasomnias do not signal emotional distress. Additionally, they were instructed to establish an earlier and more regular bedtime to decrease their son’s sleep deprivation and help prevent episodes. As a result of those steps, the frequency of the night terrors went from nearly nightly to a very tolerable once or twice a week. No medication was required. One year later, their son experienced a 14-night stretch of sleep terrors when school started because he was not getting enough sleep. Establishing a stable sleep hygiene was sufficient to reduce the number of episodes.

To help pinpoint a diagnosis, the patient had an overnight video EEG that captured several potential seizures during sleep. The seizure occurred at school and lasted five to 10 seconds. A routine EEG performed prior to the episode. The family learned that if they did not try to wake their child or console him, the episodes were shorter. The patient’s parents said they became so accustomed to the episodes that they could “set their watch” by them. Because of the frequency of the episodes, the parents learned to delay their own bedtime so they could resettle their son first.

When some of these factors are present, using the Frontal Lobe Epilepsy Parameter and scoring system can be helpful (see box at right) for typical parasomnias such as sleep terrors, the FLEP score will be less than zero. For NFLE, the score will be greater than zero.

If the patient history in FLEP score indicates potential NFLE, an overnight video EEG is required to establish the diagnosis.

### Treatment Options

Antiseizure medications, including carbamazepine, esr

The dose of oxcarbazepine was increased with no remaining, although they had decreased somewhat in frequency. The dose of esr was increased with no further improvement in nocturnal seizure control. Therefore, lamotrigine was added and his nocturnal seizures disappeared.

### Sleep Terrors vs. Nocturnal Frontal Lobe Epilepsy

When closer clinical evaluation and proper diagnostic testing, health medicine specialists and pediatric neurologists at Gillette’s Center for Pediatric Neurosciences can be a resource for suspected cases of NFLE or sleep terrors.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sleep Terrrors</th>
<th>NFLE</th>
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<tbody>
<tr>
<td>Typical age of onset</td>
<td>Preschool</td>
<td>7-13 years</td>
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<tr>
<td>No. of episodes/night</td>
<td>1-2</td>
<td>1-20 or more</td>
</tr>
<tr>
<td>Behaviors</td>
<td>Moving arms and legs</td>
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</tr>
<tr>
<td></td>
<td>Steatorrinic movements</td>
<td>Possibly vocalizing or screaming</td>
</tr>
<tr>
<td>No. recall of episode</td>
<td>In none</td>
<td>In none</td>
</tr>
<tr>
<td>Prognosis</td>
<td>Other mental age or school age</td>
<td>Usually progress into adulthood</td>
</tr>
</tbody>
</table>

### Case Study – NFLE

History

After an 11-year-old boy experienced a first generalized convulsive seizure, his parents brought him to a Gillette neurologist for evaluation. The seizure occurred at school and lasted five to 10 seconds. A routine EEG performed prior to the visit was normal.

Evaluation

When questioned further, the patient’s parents reported that he was having two to four per month, the boy also had several episodes during sleep — raising suspicions that he might have NFLE. They characterized the episodes as follows: the boy would wake up one to two hours after falling asleep, sit up, scream and then speak. Afterward, he would fall back asleep, and he had no memory of the episodes in the morning. To help pinpoint a diagnosis, the patient had an overnight video EEG that captured several potential seizures during sleep. The episodes were highly stereotypic and the patient started to adjust his position in bed, and then made kicking movements, sat up and let out a scream. He fell back to sleep immediately afterward.

The clinical events were consistent with frontal lobe seizures, and the patient’s video EEG showed bursts of frontal epileptiform discharges during the episodes — confirming NFLE.

Treatment

Oxcarbazepine was started. At a two-month follow-up appointment, the patient’s parents reported that he had had no further daytime seizures. However, his nocturnal seizures remained, although they had decreased somewhat in frequency. The dose of oxcarbazepine was increased with no further improvement in nocturnal seizure control. Therefore, lamotrigine was added and his nocturnal seizures disappeared.

### Case Study – Sleep Terrors

History

The parents of a 3½-year-old boy brought their son to Gillette’s Sleep Health Clinic for an evaluation of his sleep difficulties. They described a history of nearly nightly episodes in which their son would seem to wake up screaming within 60 to 90 minutes of falling asleep. When they entered his room, they would find him aching upright in bed with his eyes open, yet he would not recognize his parents. He often would be sweating, breathing fast and looking panicked. The episodes usually lasted less than 15 minutes and ended as abruptly as they began. The following day, the patient would have no memory of the episode. The family learned that if they did not try to wake their child or console him, the episodes were shorter. The patient’s parents said they became so accustomed to the episodes that they could “set their watch” by them. Because of the frequency of the episodes, the parents learned to delay their own bedtime so they could resettle their son first.

When some of these factors are present, using the Frontal Lobe Epilepsy Parameter and scoring system can be helpful (see box at right) for typical parasomnias such as sleep terrors, the FLEP score will be less than zero. For NFLE, the score will be greater than zero.

If the patient history in FLEP score indicates potential NFLE, an overnight video EEG is required to establish the diagnosis.

### Treatment Options

Antiseizure medications, including carbamazepine, esr, lamotrigine, levetiracetam, and pyridoxine, are used to treat NFLE. A third of a half of patients with NFLE have seizures during medical treatment. In refractory patients, epilepsy surgery or a vagus nerve stimulator may be considered.

Conclusion

Sleep terrors and NFLE seizures have some similarities. With closer clinical evaluation and proper diagnostic testing, however, the two conditions can be distinguished. The sleep health medicine specialists and pediatric neurologists at Gillette Children’s Specialty Healthcare’s Center for Pediatric Neurosciences can be a resource for suspected cases of NFLE or sleep terrors.

Sleep Terrors vs. Nocturnal Frontal Lobe Epilepsy

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### References


Visit www.gillettelepon.org/SpoolMedicine/video to view a video about the Sleep Health Clinic.
disabilities and associated sleep disorders. Such disorders include obstructive sleep apnea, sleepwalking, circadian rhythm disorders, and restless leg syndrome. He uses a combination of behavior management, medications and other therapies in his practice.

Garcia is a graduate of the University of Iowa School of Medicine. He completed a residency in pediatrics and one year of fellowship training in behavioral/developmental pediatrics at Riley Hospital for Children in Indianapolis. He then completed a sleep fellowship equivalent at the Minnesota Regional Sleep Disorders Center in Minneapolis. His professional associations include the American Board of Sleep Medicine and the American Board of Pediatrics.

Nicole Williams, M.D.

Pediatric Neurologist

Nicole Williams, M.D., is a board-certified pediatric neurologist who specializes in the care of children who have epilepsy, cerebral palsy, and developmental delays, particularly neurologic conditions that appear in the infant and toddler years.

Williams graduated from the University of Minnesota Medical School and completed a pediatric residency and a child neurology residency at the University of Chicago Medical Center and La Rabida Children’s Hospital in Chicago. She went on to finish her fellowship in adolescent sleep medicine, with a particular focus on caring for children and youth who have developmental disabilities.

After receiving her medical degree from Boston University School of Medicine, Williams completed her pediatric residency at the University of Chicago Medical Center and La Rabida Children’s Hospital in Chicago. She went on to finish her fellowship in developmental and behavioral pediatrics, including training in pediatric sleep medicine, at Children’s Hospital in Boston. Williams is board-certified in general pediatrics, developmental-behavioral pediatrics, and sleep medicine. Her professional memberships include the American Academy of Pediatrics and the American Academy of Sleep Medicine.

Gildee Children’s Hospital in Palo Alto, Calif. In addition, she completed elective clinical rotations in neonatal monitoring at the University of California, San Francisco School of Medicine and pediatrics at LAIMB Hospital in Bangkok. Her studies also included a course in designing clinical research at the University of California, San Francisco School of Medicine.

Sleep Terrors or Nocturnal Frontal Lobe Epilepsy?

by John Garcia, M.D., and Nicole Williams, M.D.

Introduction

Differentiating sleep terrors from nocturnal seizures can be challenging. In both instances, patients seem suddenly non-REM sleep, they may scream, appear agitated, and move their arms and legs. However, there are important differences to look for when making a diagnosis.

Sleep Terrors

Description

Sleep terrors (also called “night terrors”) are one example of a disorder of arousal, a common type of parasomnia. Other examples include everything from calm sleepwalking to emotionally agitated or complex behaviors such as dressing or eating while asleep. Up to 17 percent of preschool-aged children experience disorders of arousal.

As its name suggests, during a disorder of arousal the person is only partially awake. Classic sleep terrors occur in the first half of the night, usually in the first 60 to 90 minutes of sleep, and the child awakens completely from deep non-REM sleep. Typically, the child has no memory of the sleep terror episode.

Children experiencing sleep terrors may display some or all of these symptoms: disorientation, emotional outbursts, such as screaming and the appearance of fear; motor activity, such as kicking or other violent behaviors; and autonomic discharges, such as flushing, sweating and tachycardia. Because of the intensity of activity during sleep terrors, patients can unintentionally hurt themselves or others during an episode. During the duration of the episodes varies, and each episode usually ends abruptly, with the child returning to a deep sleep. Typically, sleep terrors decrease in frequency and dramatic quality as the child gets older. Children usually outgrow them by the time they reach school age.

Diagnosis

Clinical evaluation is sufficient; polysomnograms and video electroencephalography (VEG) are typically not required. When evaluating a child for sleep terrors, it is important to ask if the episodes occur shortly after the onset of sleep or later in the night. Another consideration is the age of the child, because sleep terrors usually affect young children and would not be as common in a school-aged child. Additionally, ask parents if the child has a history of daytime spells or seizures, unusual posturing, limb jerking, or a change in skin color during the episodes. If the parents observe any such daytime symptoms, consider a neurological evaluation or mental disability, consider a video EEG to establish or rule out seizures.

Treatment Options

Be aware that sleep terrors are common and that most children outgrow them by the time they are school-age. Recommend that parents intervene as gently as possible. For example, parents should not try to wake the child. Instead, they should simply guide the child back to bed and help settle him or her. If the child sleepwalks, recommend safety precautions such as securing windows, putting a gate at the top of stairs, and adding a motion detector alarm in the child’s bedroom. Parents may want to stay with the child during the episode. If the sleep terrors are particularly frequent or nocturnal seizures have been ruled out, consider prescribing a low dose of clonazepam at bedtime.

Nocturnal Frontal Lobe Epilepsy

Description

Nocturnal Frontal Lobe Epilepsy (NFLE) is characterized by frontal lobe seizures that occur primarily during sleep and may mimic disorders of arousal. The perimeter behavior is agitation: Both sporadic and familial forms of NFLE exist. Although the syndrome’s typical onset occurs between 7 and 12 years, NFLE has been documented in patients from infancy to adulthood.

During a NFLE seizure, patients often exhibit behaviors that resemble sleep terrors:

Sudden, explosive arousal from non-REM sleep, often within 30 minutes of falling asleep

Vocalizations, including screaming or laughing

Arm and leg movements, such as staring posturing (one arm extended while the other flexes), kicking or bicycling pedaling motions of legs, rocking, pelvic thrusting, or tonic stiffening of the limbs

Returning to sleep immediately after the seizure

continued on Page 2
Conclusion

bazepine, lamotrigine, topiramate, and levetiracetam, are used

Treatment Options

During clinical evaluation, several factors point to NFLE rather

Diagnosis

with sleep terrors.

characteristics typically associated with NFLE are not seen

suffer from chronically disrupted sleep, and parasomnias and

mistake NFLE for sleep terrors. Children with both disorders

Given the similarities in symptoms, it would be possible to

recorded during the ictal period might not capture seizure

have normal CT scans and MRIs. Additionally, EEGs of patients

Because a large portion of the frontal lobe cortex is undetected

When some of these factors are present, using the Frontal Lobe

• Patient has a history of daytime sleepiness, daytime seizures,

• Episodes typically include stereotypic movement.

• Some patients experience a nonspecific aura of some sort, such as auditory or visual hallucinations.

• Patient may recall episodes.

• Patient has a history of daytime sleepiness, daytime seizures or neurodevelopmental disabilities or has a family history of epilepsy.

When some of these factors are present, using the Frontal Lobe Epilepsy Scale (FLEP) score4 can be helpful (see box at right). For typical parasomnias such as sleep terrors, the FLEP score will be less than zero. For NFLE, the score will be greater than zero.

If the patient history or FLEP score indicates potential NFLE, an overnight video EEG is required to establish the diagnosis.

Treatment Options

Assurance medications, including carbamazepine, oxcar- baizepine, levetiracetam, topiramate, and levetiracetam, are used

A third of a half of patients with NFLE have seizures despite medical treatment. In refractory patients, epilepsy surgery or a vagus nerve stimulator may be considered.

Conclusion

Sleep disorders in NFLE have similarities. With closer clinical evaluation and proper diagnostic testing, however, the two conditions can be distinguished. The sleep health medicine specialists and pediatric neurologists at Gillette Children’s Specialty Healthcare’s Center for Pediatric Neurosciences can be a resource for suspected cases of NFLE or sleep terrors.

Case Study – Sleep Terrors

The parents of a 7-year-old boy brought their son to Gillette’s Sleep Health Clinic for an evaluation of his sleep difficulties. They described a history of nearly nightly episodes in which their son would seem to wake up screaming within 60 to 90 minutes of falling asleep. When they entered his room, they would find him sitting upright in bed with his eyes open, yet he would not recognize his parents. He often would be sweating, breathing fast and looking panicked. The episodes usually lasted less than 15 minutes and ended as abruptly as they began. The following day, the patient would have no memory of the episode. The family learned that if they did not try to wake their child or consoling him, the episodes were shorter. The patient’s parents said they became so accustomed to the episodes that they could “set their watch” by them. Because of the frequency of the episodes, the parents learned to delay their own bedtimes so they could rest with their son first. Evaluation

When questioned further, the parents said the patient’s bedtime ranged from 8:30 to 10:30 p.m., which indicated he was a school age child. He got one to two naps during the day. In his sleep, he would not move his limbs. He would have problems with his breathing. After questioning the parents further, the patient’s parents said they became so accustomed to the episodes that they could “set their watch” by them. Because of the frequency of the episodes, the parents learned to delay their own bedtimes so they could rest with their son first.

The clinical events were consistent with frontal lobe seizures, and the patient’s video EEG showed bursts of frontal epileptiform discharges during the episodes — confirming NFLE.

Treatment

Oxcarbazepine was started. At a two-month follow-up appointment, the patient’s parents reported that he had no further daytime seizures. However, his nocturnal seizures remained, although they had decreased somewhat in frequency. The dose of oxcarbazepine was increased with no further improvement in nocturnal seizure control. Therefore, lamotrigine was added and his nocturnal seizures disappeared.

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