

Curbing nocturnal binges in sleep-related eating disorder

Sleepwalking-like behavior is a frequently undiagnosed cause of patients' obesity

Ms. G, age 39, has a body mass index (BMI) >35 kg/m² and is pursuing bariatric surgery to treat obesity. She is frustrated with dieting and describes a decade of unconscious nocturnal eating, including peanut butter and uncooked spaghetti.

This behavior began after her divorce 10 years ago. Initially she had partial recall of the nocturnal binges, but now describes full amnesia. Treatment for a depressive episode did not control her nocturnal eating.

Sleep-related eating disorder (SRED) can be associated with disrupted sleep, weight gain, and major chronic morbidity. In SRED—involuntary eating while asleep, with partial or complete amnesia—the normal suppression of eating during the sleep period is disinhibited. The disorder can be idiopathic, associated with medication use, or linked to other sleep disorders such as somnambulism (sleepwalking), restless legs syndrome (RLS), periodic limb movement disorder (PLMD), or obstructive sleep apnea (OSA).

SRED is more common in women than men; it usually begins in the third decade of life but can begin in childhood or middle age. About one-half of SRED patients also have a psychiatric illness, usually a mood disorder. Unremitting SRED may lead to psychopathology, as the onset of sleep-related eating usually precedes the onset of a psychiatric disorder by years.

SRED often is unrecognized, but it can be effectively identified and treated. This article examines how to:



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Sleep-related eating

Clinical Point

SRED patients with partial awareness often describe the experience as being involuntary, dream-like, and 'out-of-control'

Box

Sleeping and eating: Closely linked activities

Because hormones that regulate appetite, food intake, and body weight also play a role in sleep regulation, patients with eating disorders often have associated sleep disorders. For example, obesity is related to obstructive sleep apnea (OSA)—weight gain is a risk factor for OSA, and weight loss often is an effective treatment.¹ Moreover, patients with anorexia nervosa frequently demonstrate sleep initiation and maintenance insomnia.²

Conversely, epidemiologic studies have demonstrated that sleep duration is inversely correlated with body mass index. In particular, individuals with shorter sleep times are more likely to be overweight.³ The nature of this association is unclear; however, hormones that normally regulate appetite are disrupted in patients with sleep deprivation. For instance, leptin is an appetite suppressant that is normally released from adipocytes during sleep, so sleep deprivation may promote hunger by restricting its secretion.⁴

- distinguish SRED from nocturnal eating syndrome (NES) and other disorders
- identify precipitating causes
- select effective pharmacologic therapy.

Differentiating SRED from NES

Eating and sleeping—and disorders of each—are closely linked (*Box*).¹⁻⁴ SRED and night eating syndrome (NES) are 2 principal night eating disorders. SRED is characterized by inappropriately consuming food after falling asleep,⁵ whereas NES is characterized by hyperphagia after the evening meal, either before bedtime or after fully awakening during the night.⁶

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To meet diagnostic criteria for SRED, patients must experience involuntary nocturnal eating and demonstrate at least 1 other symptom, such as:

- eating peculiar, inedible, or toxic substances
- engaging in dangerous behavior while preparing food (*Table 1*).

Level of consciousness. In both SRED and NES, patients demonstrate morning anorexia. However, patients with NES report being awake and alert during their nocturnal eating, whereas patients with SRED describe partial or complete amnesia. SRED patients with partial awareness often describe the experience as being involuntary, dream-like, and “out-of-control.” Interestingly, hunger is notably absent during most episodes in which patients have at least partial awareness.

Typically, patients cannot be awakened easily from a sleep-eating episode. In this regard, SRED resembles sleepwalking. Sleepwalking without eating often precedes SRED, but once eating develops it often becomes the predominant or exclusive sleepwalking behavior. This pattern has led many researchers to consider SRED a “sleepwalking variant disorder.”

Eating episodes in SRED are often characterized by binge eating, and many patients describe at least one episode per night.⁵ They usually eat high-calorie foods. The spectrum of cuisine is broad, ranging from dry cereal to hot meals that require more than 30 minutes to prepare. Patients treated at our sleep center report eating foods that are high in simple carbohydrates, fats, and—to a lesser extent—protein. Peanut butter—a preferred item—can lead to near-choking episodes when patients fall asleep with peanut butter in their mouths and wake up gasping for air. Alcohol consumption is rare.

SRED episodes can be hazardous, with risks of drinking or eating excessively hot liquids or solids, choking on thick foods, or receiving lacerations while using knives to prepare food. Patients may consume foods to which they are allergic or eat inedible or even toxic substances (*Table 2, page 22*).^{5,7-9}

Table 1

Diagnostic criteria for sleep-related eating disorder

- A. Recurrent episodes of involuntary eating and drinking during the main sleep period
- B. One or more of the following must be present with these recurrent episodes:
1. Consumption of peculiar, inedible, or toxic substances
 2. Insomnia related to repeated episodes of eating, with a complaint of nonrestorative sleep, daytime fatigue, or somnolence
 3. Sleep-related injury
 4. Dangerous behavior while preparing food
 5. Morning anorexia
 6. Adverse health consequences from recurrent binge eating
- C. The disturbance is not better explained by another sleep, medical, or neuropsychiatric disorder

Source: *International classification of sleep disorders: diagnostic and coding manual, 2nd ed.* Westchester, IL: American Academy of Sleep Medicine; 2005:174-5.

Chain of consequences

Repeated nocturnal binge eating episodes can have multiple adverse health effects.^{5,7} Patients often wake up with painful abdominal distention. Weight gain and subsequent increased BMI may compromise the control of medical complications such as diabetes mellitus, hyperlipidemia, hypertriglyceridemia, hypertension, OSA, and cardiovascular disease. Patients with SRED also report dental problems such as tooth chipping and increased incidence of caries.

Failure to control nocturnal eating can lead to secondary depressive disorders related to excessive weight gain. Moreover, SRED patients' nighttime behaviors may disrupt their bed partners' sleep and cause interpersonal and marital problems.

Untreated SRED is usually unremitting. In our experience, most patients describe suffering for years before seeking treatment. Many report that their symptoms have been dismissed by other physicians or wrongly attributed to a mood disorder. Not surprisingly, patients in obesity clinics and eating disorder groups regularly report SRED.

Multiple causes

Medication-induced. The commonly prescribed hypnotic zolpidem can induce SRED.^{10,11} Sporadic cases of SRED have been reported with other psychotropics, such as tricyclic antidepressants,

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*Data from a study comparing driving in 105 young adults with ADHD to 64 community control adults without the disorder.

Reference: 1. Barkley RA, Murphy KR, DuPaul GJ, Bush T. Driving in young adults with attention deficit hyperactivity disorder: knowledge, performance, adverse outcomes, and the role of executive functioning. *J Int Neuropsychol Soc.* 2002;8:655-672.

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At our sleep center, we ask patients and their families to track the patient's sleep and nocturnal eating behavior 2 weeks before a clinic visit

Table 2
Typical foods consumed while sleep-eating

Simple	Peanut butter, dry cereal, candy, bread/toast
Peculiar	Uncooked spaghetti, sugar/salt sandwiches, cat/dog food, frozen food
Inedible/toxic	Egg shells, coffee beans, sunflower shells, buttered cigarettes, glue/cleaning solutions

anticholinergics, lithium, triazolam, olanzapine, and risperidone.¹²

Life stressors. For a subgroup of patients, such as Ms. G, a life stressor such as a death or divorce precipitates the disorder. Others report SRED onset with cessation of cigarette smoking, ethanol abuse, or amphetamine/cocaine abuse.^{5,7} Thus, SRED can be viewed as a “final common pathway disorder” that can be triggered by a variety of sleep disorders, medical-neurologic disorders, medications, and stress. It also can be idiopathic (*Table 3*).¹²

CASE CONTINUED

Reaching a diagnosis

Ms. G's psychiatrist refers her to an accredited sleep center, where she is instructed to keep a diary of her eating and sleeping behaviors for 2 weeks. She returns to the center and undergoes overnight video polysomnography (PSG). During this test, Ms. G demonstrates recurrent confusional arousals arising from non-rapid eye movement sleep (NREM) and eating binges while asleep with no subsequent recall.

Sleep studies aid diagnosis

Diagnosing a patient with SRED requires taking a diligent history to:

- characterize nocturnal eating
- identify predisposing or precipitating factors
- differentiate the behavior from other sleep-related or eating disorders.

At our sleep center, we frequently ask patients and their families to track the patient's

sleep and nocturnal eating behavior 2 weeks before a clinic visit. These diaries help document sleep and eating patterns and assess the patient's awareness and subsequent recall.

As described above, recurrent nighttime eating with full awareness and control would be best characterized as NES. However, there is some debate as to the extent that SRED can manifest with substantial or full alertness and subsequent recall.¹³ SRED and NES might be at opposite poles of a pathology continuum, in which a subgroup of patients falls into a “gray area” of mixed SRED/NES features.^{13,14}

Self-induced emesis or other purging behavior usually is not seen in SRED. If a patient presents with this symptom, consider an alternate diagnosis such as bulimia nervosa. A patient with SRED may be diagnosed with a coexisting eating disorder, however, as long as the diagnostic features of the eating disorder are not associated with the nocturnal episodes of SRED.

Finally, at least 2 reports exist of a nocturnal dissociative disorder, in which a recurrent nocturnal “eating personality” emerges.⁷

Sleep laboratory testing. Overnight video PSG—recording the biopsychologic changes that occur during sleep—often is valuable in characterizing SRED and identifying other sleep disorders. To facilitate the eating behavior, we ask patients to bring to the sleep laboratory commonly consumed food to be placed within reach of their bed.

If the patient does eat during the study, we identify the sleep state (non-REM sleep or REM sleep) that precipitates the behavior. Confusional arousals, both with and without eating, usually arise from non-REM sleep.

In patients with SRED, PSG often helps to identify other sleep abnormalities that trigger arousal. Reversible disorders such as RLS, PLMD, and OSA or more subtle sleep disordered breathing are especially important to identify so they can be properly treated. Recently, PSG found rhythmic masticatory muscle activity in stages 1 and 2 non-REM sleep in 29 of 35 patients diagnosed with SRED.¹⁵

Table 3

Sleep disorders and medications associated with SRED

Sleep disorders	Sleepwalking, obstructive sleep apnea, restless legs syndrome, circadian rhythm disorder, narcolepsy
Medications	Zolpidem, lithium, triazolam, olanzapine, risperidone, anticholinergics
Source: References 5,7-9	

CASE CONTINUED

Adding medication

After diagnosing SRED, Ms. G's psychiatrist initiates the anticonvulsant topiramate, 25 mg at bedtime. After the dose is gradually increased in 25-mg increments to 100 mg at bedtime, Ms. G achieves full control of recurrent nocturnal eating. She loses 40 pounds within the next 6 months.

Pharmacotherapy

SRED is treatable and a reversible cause of obesity. The choice of medication depends on:

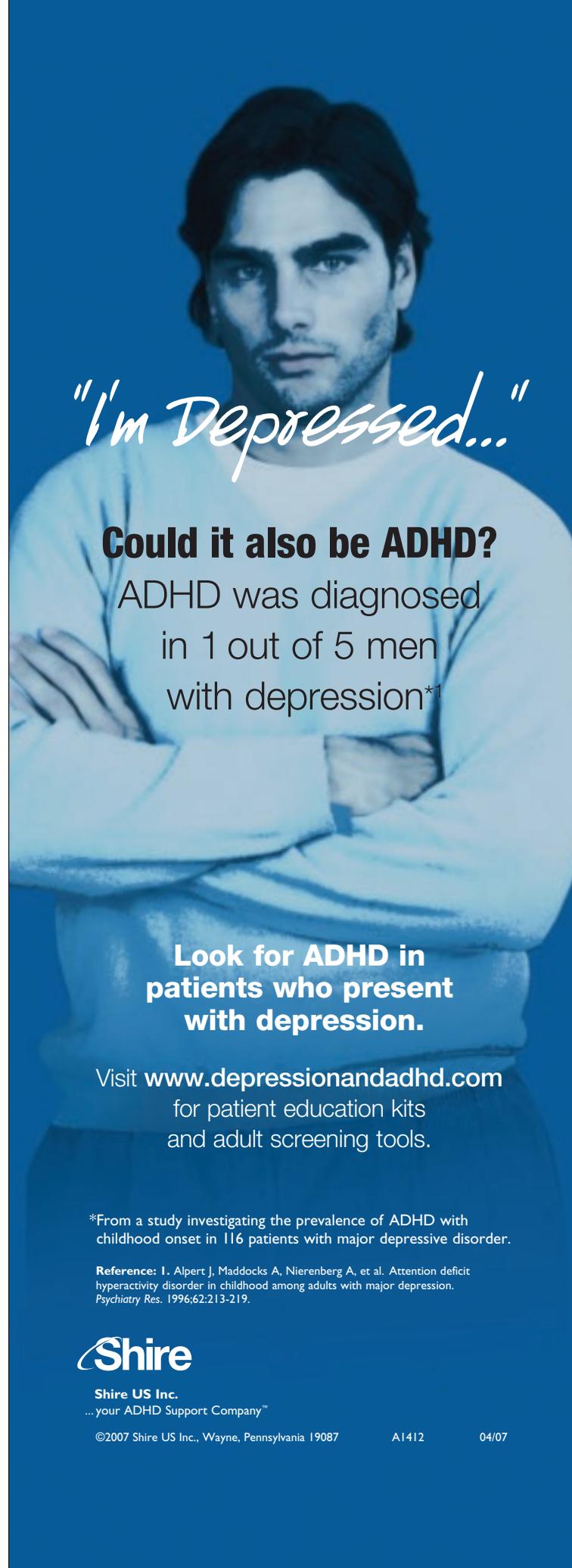
- which form of SRED the patient exhibits (drug-induced or idiopathic)
- whether the patient has treatable comorbid conditions.

Temazepam. Switch patients whose SRED is triggered by zolpidem or another hypnotic to a different agent. We have had excellent success with temazepam, 15 to 30 mg at bedtime.

Topiramate. For idiopathic SRED or the sleepwalking variant of SRED, trials from 2 academic institutions suggest that off-label use of topiramate, 25 to 150 mg at bedtime, may be the treatment of choice.¹⁶⁻¹⁸

Start topiramate at 25 mg, and increase in 25-mg increments every 5 to 7 days until the night eating episodes are eliminated. Paresthesias, visual symptoms, and (rarely) renal calculus are reported side effects.

Other medications. Other agents that have shown at least some benefit in patients with SRED include dopaminergic agonists, opiates, and clonazepam.¹⁴ Patients with SRED and a history of chemical dependency may respond to combined levodopa, trazodone, and bupropion (dopaminer-



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Reference: I. Alpert J, Maddocks A, Nierenberg A, et al. Attention deficit hyperactivity disorder in childhood among adults with major depression. *Psychiatry Res.* 1996;62:213-219.

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Self-induced emesis or other purging behavior usually is not seen in SRED

gic/noradrenergic antidepressant) therapy at bedtime.¹⁹ Also focus treatment on any coexisting sleep disorder, such as RLS or OSA.

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Related Resources

- American Obesity Association. www.obesity.org.
- American Insomnia Association. www.americaninsomniaassociation.org.
- Schenck CH. *Paradox lost: midnight in the battleground of sleep and dreams*. Minneapolis, MN: Extreme-Nights, LLC; 2006.

Drug Brand Names

Bupropion • Wellbutrin	Temazepam • Restoril
Clonazepam • Klonopin	Topiramate • Topamax
Levodopa/carbidopa • Sinemet	Trazodone • Desyrel
Lithium • Eskalith, Lithobid	Triazolam • Halcion
Olanzapine • Zyprexa	Zolpidem • Ambien
Risperidone • Risperdal	

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Bottom Line

Suspect sleep-related eating disorder (SRED) in patients who report nocturnal eating with little or no recall. Perform a careful history, focusing on sleep complaints, and a medication review. Refer patients to an accredited eating sleep center for overnight video polysomnography. Off-label topiramate may be the treatment of choice for idiopathic or the sleepwalking variant of SRED.