

Sleep-Related Eating Disorder and Night Eating Syndrome: Sleep Disorders, Eating Disorders, or Both?

Comment on Vetrugno R; Manconi M; Ferini-Strambi L et al. Nocturnal eating: sleep-related eating disorder or night eating syndrome? A videopolysomnographic study. *SLEEP* 2006;29(7):949-954.

John W. Winkelman, MD, PhD

Sleep Health Center, Brigham & Women's Hospital, Newton Center, MA

HUNGER AND SLEEP ARE FUNDAMENTAL BIOLOGIC DRIVES UNDER THE CONTROL OF BOTH HOMEOSTATIC AND CIRCADIAN INFLUENCES. NOCTURNAL EATING disorders occur when the coordination of these 2 drives is dysregulated, resulting in the disordered eating of a daytime eating disorder combined with the disordered sleep of a sleep disorder. Investigations into nocturnal eating have proceeded along 2 parallel tracks. Eating disorders specialists use the term night eating syndrome (NES), coined by Stunkard et al in 1955,¹ for patients with nighttime eating. Criteria for NES include the consumption of 50% or more of daily calories after the evening meal, eating after waking from sleep, and morning anorexia.² Concurrently, clinical sleep researchers have described sleep-related eating disorder (SRED), with a focus on its relationship to parasomnias and other primary sleep disorders.^{3,4}

Whether NES and SRED are the same or distinct disorders is unclear. Both involve nearly nightly bingeing at multiple nocturnal awakenings, defined as excess calorie intake or loss of control over consumption. Both have a prevalence of about 1% to 5% of adults^{5,6}; are predominantly found in women, with a young adult onset; and have a chronic course.⁷ Both have a primary morbidity of weight gain, sleep disruption, and shame over loss of control over food intake.^{8,9} Purging, as seen in bulimia nervosa, is rarely present. Both have familial bases.^{4,10} Comorbid depression^{6,11} and daytime eating disorders^{4,11} are often observed in both NES and SRED. Both may respond to similar pharmacologic treatments.^{2,12} Unfortunately, an assessment of the relationship between NES and SRED is hampered by the lack of standardized assessments for nocturnal eating and variations in the diagnostic criteria for the disorders, as well as a lack of coordinated research between the 2 specialist fields.

The most prominent cited distinction between NES and SRED is the level of consciousness during nighttime eating episodes. Whereas those with NES eat after attaining full awareness, those with SRED often report that they are "half asleep, half awake"

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Address correspondence to: John W. Winkelman, MD PhD, Sleep Health Center, Brigham & Women's Hospital, 1400 Center Street, Suite 109, Newton Center, Massachusetts 02459; Tel: (617) 527-2227; Fax: (617) 527-2098; E-mail: jwinkelman@sleephealth.com

or even fully asleep during nocturnal episodes and may have impaired recollection for the event the following morning.^{2,4} Some of the variance between these 2 sets of patients may relate to the referral patterns and biases of the researchers: sleep disorders specialists see those with parasomnias and are more concerned with the fine points of level of consciousness during nocturnal behaviors, whereas those with an eating disorders background are more focused on the timing, type, and number of calories consumed.

To characterize night eating from the 2 specialists' perspectives in brief: patients with SRED are sleepwalkers who happen to eat, whereas patients with NES are those with binge eating disorder who happen to eat at night. Both of these explanations are probably too simple. Recent data suggest that the previously observed endocrine abnormalities in NES demonstrating a delay in the phase relationship of eating to sleep¹³ are probably the result, rather than the cause, of night eating.^{14,15} From the opposite perspective, many of the patients with SRED may not have primary sleep disorders.¹² To further confound matters, many of those with alterations in level of consciousness during nocturnal eating (and thus diagnosed with SRED) may also have night eating with full alertness, either at other episodes in the same night or at other periods during the course of the nocturnal eating disorder.¹⁶ In this way, rather than being two distinct disorders, pure SRED and NES may reflect opposite ends of a continuum of impairment of consciousness during nocturnal eating.

Although these diagnostic issues remain unresolved on clinical and scientific bases, the recent revision of the International Classification of Sleep Disorders (ICSD) has effectively eliminated the distinction between the 2 disorders¹³ (Table 1). The diagnostic criteria for SRED in the revised ICSD do not specify a level of consciousness during episodes of nocturnal eating and, thus, incorporates NES into SRED. Whether this "lumping" will advance our understanding of the biology of nocturnal eating disorders is yet to be seen. However, the new nosology provides a uniform diagnostic code for all such disorders, facilitating better identification across specialty clinics.

The paper by Vetrugno and associates¹⁷ from a sleep disorders clinic in Italy describes 35 patients who in many respects confirm the previous SRED phenotype: young overweight women with a chronic course of multiple awakenings from sleep per night with nocturnal eating. However, only 1 patient had a history of sleepwalking. Polysomnography demonstrated reduced sleep efficiency, and two-thirds had a periodic limb movement index greater than 5. In the laboratory, more than 70% ate at nocturnal awakenings, all with full consciousness during electroencephalogram-defined wakefulness, consistent with previous reports.⁴ No patients had amnesia for the episodes the following morning. In these latter respects, the patients more closely approximated those

Table 1—Definition and Diagnostic Criteria for Sleep-Related Eating Disorder^a

- A. Recurrent episodes of involuntary eating and drinking occur during the main sleep period.
- B. One or more of the following must be present with the recurrent episodes of involuntary eating and drinking:
1. Consumption of peculiar forms or combinations of food or inedible or toxic substances.
 2. Insomnia related to sleep disruption from repeated episodes of eating, with a complaint non restorative sleep, daytime fatigue, or somnolence.
 3. Sleep-related injury.
 4. Dangerous behaviors performed while in pursuit of food or while cooking food
 5. Morning anorexia.
 6. Adverse health consequences from recurrent binge eating of high caloric food.
- C. The disturbance is not better explained by another sleep disorder, medical or neurologic disorder, mental disorder, medication use or substance use disorder (hypoglycemic states, peptic ulcer disease, reflux esophagitis, Kleine-Levin syndrome, Kluver-Bucy syndrome, and nighttime extension of daytime Anorexia Nervosa (binge/purge subtype), bulimia nervosa, and binge eating disorder).

^aFrom The International Classification of Sleep Disorders: Diagnostic and Coding Manual, 2nd ed. Westchester, IL: American Academy of Sleep Medicine; 2005:174-5.

usually characterized as having NES rather than SRED, even in sleep laboratory settings.¹⁸ Unfortunately, the authors do not specify whether their patients reported altered levels of consciousness during their episodes of nocturnal eating outside the sleep laboratory. The presence of full alertness during such episodes on polysomnography is not a legitimate test of their standard behavior (as is clear with parasomnias). Thus, it is unclear whether this is another common example in medicine of “didn’t ask, so don’t know.”

The Vetrugno report includes the first documentation of recurrent sleep-related masseter and orbicularis oris electromyographic activity in SRED, confirmed by video polysomnography to be masticatory and swallowing behavior. This periodic activity was present in most (29/35) of the patients at high rates (mean of 116 movements per patient per night), occurred during stages 1 and 2 sleep (and not during wake), and was associated with electroencephalogram arousal and tachycardia. Such electromyographic activity has previously been named rhythmic masticatory-muscle activity and is seen in bruxism.¹⁹ The co-occurrence of periodic limb movements of sleep and this masticatory behavior suggested to the authors that SRED and restless legs syndrome/periodic limb movements of sleep may have a common dopaminergic mechanism.

The inclusion of a definition of SRED in the revised ICSD that consolidates all nocturnal eating disorders presents multiple opportunities for advancement in this area. With consistently defined patient populations, questions of prevalence, clinical heterogeneity, course, familial prevalence, and therapy can be addressed more definitively. SRED may eventually be split into subtypes in the future based upon clinical features (e.g., amnesia), polysomnographic characteristics, or associated sleep or daytime eating disorders. Coordination between specialists in sleep disorders with those researching energy regulation and cognition has already provided new insights,^{20,21} which can now hopefully be applied to patients with night eating. Finally, recognition of SRED by the

revised ICSD may ultimately provide legitimacy to this highly impairing disorder in an era suspicious of “new” diagnoses.

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