

CASE REPORTS

Integrative behavioral treatment for NREM parasomnias: a case series

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A variety of behavioral interventions have been shown to improve symptoms of non-rapid eye movement parasomnias. Prior reports have typically examined outcomes of a single behavioral intervention. However, non-rapid eye movement parasomnias may benefit from a multipronged treatment approach similar to that used in the behavioral treatment of other sleep disorders. Through a series of 3 case reports, we demonstrate the utility of a case-conceptualization based, integrative approach to behavioral treatment of adult non-rapid eye movement parasomnias. For all patients (2 with disorders of arousal and 1 with sleep-related eating disorder), symptoms were satisfactorily reduced after 3–6 sessions. Treatment was tailored to each individual, but common elements included education, hypnosis, and identifying and reducing priming factors (eg, stress, insufficient sleep) and precipitating factors (eg, noise or touch from bed partners).

Keywords: parasomnias, sleep arousal disorders, sleepwalking, sleep terrors, confusional arousals, sleep-related eating, hypnosis

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INTRODUCTION

Clinical management of nonrapid eye movement (NREM) parasomnias in adults typically begins with nonpharmacological strategies of ensuring safety, providing reassurance and education, and advising patients to avoid triggers (priming and precipitating factors) such as sleep deprivation.^{1–3} When the negative consequences of parasomnias (eg, safety risk, poor sleep quality) warrant further treatment, medications—particularly clonazepam—are the typical next step.^{4,5} However, nonpharmacological treatments have a more favorable safety profile⁴ and are more acceptable to some patients. Numerous behavioral interventions have been shown to improve NREM parasomnia symptoms, including scheduled awakenings (although most studies have been in pediatric populations),² hypnosis,^{6–9} mindfulness-based stress reduction,⁵ cognitive behavioral therapy for insomnia (CBT-I),⁵ CBT for stress and anxiety,⁵ and CBT focused on relaxation training and cognitive therapy.⁹ Both behavioral and pharmacological treatments have been examined primarily in case reports or small uncontrolled trials in which a single intervention was provided. Because of this, there is not yet a sufficient evidence base to support one intervention—or combination of interventions—over another.⁴ The case reports that follow illustrate a case conceptualization-based approach to the behavioral treatment of NREM parasomnias that incorporates multiple behavioral strategies tailored to the individual.

REPORT OF CASES

Case 1

Presenting problem

This 30-year-old man reported a history of sleep talking in childhood but was uncertain at what age this began or resolved.

He presented to the sleep clinic with current symptoms of sleepwalking and confusional arousals that had begun at age 25, precipitated by a series of several major life stressors, including a motor vehicle accident and career change. At the time he came to the sleep clinic his symptoms did not pose any safety risk and usually did not wake the patient or his wife, but the parasomnia episodes were captured by a camera he had set up in the bedroom. Based on his daily review of the video (which had the capability to automatically detect periods with movement), he knew that parasomnias were occurring on approximately 50% of the nights. The patient also kept written logs of possible triggers. He had identified stress as a factor that increased the frequency of parasomnias. Additionally, being touched while asleep had directly precipitated some of his parasomnias. He wished to reduce parasomnias because “bad” episodes left him feeling exhausted the following day. Additionally, he and his wife were planning to start a family and the patient worried about symptoms worsening and posing risk to his family. The patient reported sleeping 7–8 hours per night, which he felt was sufficient. Based on polysomnography and patient report, he had no symptoms of other sleep disorders such as sleep apnea or restless legs syndrome.

Intervention and treatment course

The patient completed an initial evaluation and 2 follow-up treatment sessions over the course of 6 weeks. At the initial evaluation, education was provided about parasomnias. Cognitive therapy strategies were also used to explore the patient’s anxiety about his parasomnias, which contrasted with the generally mild nature of his symptoms. Although the data gathered from his tracking of symptoms were useful, continued focus on this seemed it would have diminishing returns as well as the potential to exacerbate parasomnia-related anxiety. Thus, he was encouraged to minimize his time spent tracking

symptoms and triggers going forward. Symptoms were unchanged at the first follow-up session. Hypnosis was conducted during this session, and the patient was instructed to practice self-hypnosis daily at home with the 25-minute recording. He reported a “dramatic reduction” in symptoms at his next follow-up a month later. Based on his video, he displayed only 1 minor episode per week. He was no longer getting out of the bed but merely briefly sitting up, and the symptoms were not waking him or his wife. The patient also reported decreased anxiety about his symptoms. Given this satisfactory improvement, no other interventions were deemed necessary.

Case 2

Presenting problem

This patient was a 27-year-old woman seeking treatment for sleep-related eating disorder. She reported a history of sleepwalking in childhood. In college, her sleepwalking and sleep talking was a source of amusement to her roommates, but she did not find that the symptoms impacted her quality of life. For the past few years, her sleepwalking and talking had worsened and also included sleep eating. She would get out of bed and eat a few times per week. During these episodes, she ate whatever was available (leftovers, easily accessible snack foods). A few times, she ate uncooked foods. She often ate messily (eg, casserole with her hands). She woke in the morning with no memory of the eating episodes and often discovered the messy results of her sleep eating in the kitchen and on her hair and clothes. She reported feeling unrefreshed by her sleep and also embarrassed by these episodes. She reported having a consistent sleep schedule with adequate time in bed (10 PM to 7 AM) and she did not endorse symptoms of insomnia, sleep apnea, or restless legs syndrome. She believed that extra calories consumed at night contributed to difficulty losing weight and increased need for dental procedures. She identified stress as a contributing factor to the increased incidence of parasomnias.

Intervention and treatment course

She attended an evaluation and 2 follow-up treatment sessions over a 6-week period. At the first follow-up, we reviewed sleep logs and her notes about potential triggers. She reported that since the intake, she had more sleep eating than usual, which she attributed to having premenstrual symptoms, such as abdominal cramps, fatigue, and lower mood for the past week. She noted that having a more irregular sleep schedule and poorer diet and exercise habits appeared to increase her parasomnia. In fact, she had 1 of her worst episodes in a long time—she ate a pound of sliced cheese 1 night. Because she is lactose intolerant, this episode caused her to feel sick and need to miss 1 day of work. After the initial assessment, her husband identified that he was a possible contributor to her sleep eating when he went to bed at 12 AM, 2 hours after she fell asleep. Treatment included 1) education about parasomnias and triggers; 2) mitigation of environmental triggers (husband would go to bed at the same time); 3) stress management, including increasing exercise; and 4) hypnosis (30 min recording, goal of 5 days per week). At the second treatment session, the patient reported that these techniques eliminated her parasomnia. Her husband did not mind

adjusting to her bedtime. In addition, she felt the hypnosis and other stress management measures were beneficial to her sleep at night as well as daytime function.

Case 3

Presenting problem

This 30-year-old woman presented with worsening sleep terrors and confusional arousals following the recent birth of her first child. These symptoms were frightening to her and to her husband. She reported a history of sleep terrors, sleepwalking, and sleep talking in childhood. While in college, the patient sought treatment at a sleep clinic because the talking was bothering her roommate. She tried lorazepam but stopped due to adverse effects. As an adult, she continued to have brief confusional arousals 1–2 times per week, as well as sleep terrors every 2–3 months, which typically included frightening content such as thinking she was covered in insects. After the birth of her child, her sleep terrors increased in frequency to 3 times per week, then gradually decreased to once per week over the first few months postpartum. The sleep terrors became centered around thinking the baby had become lost in the bed. The patient would frantically search for her baby, even at times diving across the bed. For the first few months, the baby slept in a bassinet in the patient’s bedroom, then was transitioned to a crib in a separate room. At the time of the initial evaluation, the baby was sleeping well through the night. The patient reported being in bed from 10 PM to 6 AM and sleeping a total of 7–8 hours, which she felt was an adequate amount of sleep. The patient did not report any symptoms of other sleep disorders. Stress was identified as a priming factor.

Intervention and treatment course

She attended an evaluation session and 5 follow-up treatment sessions over the course of 22 weeks. At the first treatment session, sleep terrors had increased (1–2 times per week) because of work-related stress; the patient was worried not only about returning to work after maternity leave, but particularly about needing to work in a school setting in the midst of the COVID-19 pandemic. At this first treatment session, education about parasomnias was provided and hypnosis was initiated. The patient was provided a 25-minute recording with which to practice self-hypnosis daily at home. Parasomnias were eliminated for several weeks but resumed the week she returned to work (this coincided with increased stress and reduced sleep duration). During the second treatment session, stress management strategies were identified, including exercise and social support. By the third session, the severity and frequency of parasomnias had returned to her pre-baby baseline pattern of only 1–2 minor confusional arousals per week. Her husband noticed that these tended to happen when he came to bed 60–90 minutes after the patient had fallen asleep. Although she had previously expressed satisfaction with her sleep duration, she revealed that she had difficulty staying awake in the 2 hours before bedtime if sedentary (eg, watching television, reading), as well as a history of daytime sleepiness. When she fell asleep on the couch, she would sometimes experience parasomnias seemingly triggered by the noise of the television. The patient

Table 1—Patient characteristics and treatment summary.

| | Case 1 | Case 2 | Case 3 |
|-----------------------------------|--|---|--|
| Age and sex | 30-year-old male | 27-year-old female | 30-year-old female |
| Parasomnia symptoms | Sleepwalking, confusional arousals | Sleep eating | Sleep terrors, confusional arousals |
| Comorbid sleep disorders | None | None | None |
| Initial symptom frequency | 50% of nights | Several times per week | ST 1–2×/w, CA 1 2×/w |
| Treatment outcome | Elimination of SW, CA reduced to 1×/w | Elimination of sleep eating | Elimination of ST, CA reduced to 1×/w |
| Length of treatment | 3 sessions (6 weeks) | 3 sessions (6 weeks) | 6 sessions (22 weeks) |
| Priming and precipitating factors | Stress, touch | Stress, PMS, decreased exercise, husband coming to bed | Stress, insufficient sleep, noise, husband coming to bed |
| Treatment components | Education, cognitive therapy, hypnosis | Education, mitigate triggers, stress management, hypnosis | Education, mitigate triggers, stress management, hypnosis, sleep extension |

Summary of cases includes parasomnia symptoms, treatment course, and treatment outcomes. CA = confusional arousals, PMS = premenstrual syndrome, ST = sleep terrors, SW = sleepwalking.

completed the Epworth Sleepiness Scale,¹⁰ which demonstrated a high degree of daytime sleep propensity (total score of 12). After providing information about normal variability in sleep duration to correct her misconception that adults should not need more than 7–8 hours of sleep, a goal of extending nighttime sleep was established. At the fourth treatment session, the patient had not been able to extend nighttime sleep due to interim stressors. Sleep terrors were occurring every 2 weeks and continued to be fairly mild. However, confusional arousals had increased to nightly and were clearly triggered by her husband coming to bed. She was subsequently able to increase sleep duration by 30–60 min by going to bed when sleepy rather than dozing on the couch. This, along with coincidentally moving to a new home that was larger and therefore reduced household noise she heard from the bedroom, allowed her to achieve longer and better quality sleep. She reported feeling more rested, and her daytime sleepiness as measured by the Epworth Sleepiness Scale was no longer elevated (total score of 4). By the end of treatment, sleep terrors no longer occurred and mild confusional arousals occurred only once per week.

DISCUSSION

Prior research has provided support for a multitude of behavioral strategies that can be employed in the treatment of NREM parasomnias. The cases presented above demonstrate the usefulness of a flexible, case conceptualization-based approach to integrating these behavioral strategies. As summarized in **Table 1**, the type and number of interventions employed varied for each individual. Components that were implemented with all 3 of these cases included education, hypnosis, and mitigating any identified priming or precipitating factors. Stress was identified as a priming factor for all of these patients, and stress management was a component of treatment for cases 2 and 3. For case 1, stress and anxiety related to the parasomnia symptoms were addressed with cognitive therapy techniques. Sleep extension was important for 1 patient (case 3). All 3 of these patients were married, and spouses played a role in providing

information about the parasomnias and triggers (and were sometimes themselves a precipitant for parasomnias). In each of these cases, symptoms resolved or were satisfactorily attenuated through a combination of behavioral interventions.

Clinical implications

These case reports illustrate an approach to integrating disparate behavioral strategies that have been previously reported in the literature. This approach bears semblance to other behavioral sleep interventions such as CBT-I and Exposure, Relaxation, and Rescripting Therapy, which integrate multiple components to address factors contributing to sleep disturbance. In the absence of sufficient evidence to favor certain strategies over others,⁴ this approach to the treatment of NREM parasomnias allows for flexibility based on patient preference, clinical judgment, and clinician skill set.

In keeping with standard clinical practice, we recommend that issues of safety be addressed first in NREM parasomnia treatment. If safety cannot be ensured with environmental modifications, pharmacotherapy should be considered. For patients taking medication, behavioral treatment can proceed as needed for residual symptoms or to work toward a goal of managing symptoms without medication. A treatment algorithm previously proposed by Drakatos and Leschziner⁴ recommends that behavioral strategies of sleep hygiene, modifying extrinsic factors, providing reassurance, and scheduled awakenings (particularly for children) be undertaken before proceeding to behavioral interventions for relaxation and anxiety reduction (mindfulness-based stress reduction, autogenic training, CBT, and hypnosis, although we would note that the latter is not merely a method of relaxation) and, as necessary, treating comorbid sleep disorders (insomnia, restless legs syndrome, periodic limb movement disorder, or obstructive sleep apnea). However, given lack of head-to-head comparison of these strategies in randomized trials, we propose that choice and order of intervention be guided by an individual's clinical presentation and preferences. Moreover, the ordering of interventions may depend on the ease and practicality of implementation, which will vary across patients. For example,

as seen in case 3, achieving sufficient sleep duration (which presumably would fall under sleep hygiene in the aforementioned model) and eliminating extrinsic factors required several sessions of education, goal setting, and troubleshooting to overcome barriers related to work and family, whereas hypnosis was easily implemented at the second session with immediate benefit.

Therefore, as a general recommendation for clinical practice, we propose that clinicians first attend to safety concerns and thereafter adopt a modular approach to behavioral intervention, choosing specific strategies and ordering them based on case conceptualization, patient interest/motivation, and ease of implementation. This type of modular approach is commonly used in cognitive behavioral treatments. Possible intervention components for NREM parasomnias could include the following: education, cognitive therapy, sleep hygiene, adequate sleep duration, mitigating triggers, CBT-I, relaxation training, CBT for stress/anxiety, mindfulness-based stress reduction, scheduled awakenings, and hypnosis. Clinician training and skills will also necessarily factor into the treatment approach. For example, although both authors are trained in clinical hypnosis and routinely use this in their treatment of NREM parasomnias, other clinicians might choose to implement alternative strategies such as relaxation training or mindfulness-based stress reduction. Given the current state of the literature showing evidence for multiple behavioral strategies, the integrative approach described in the above cases allows for a menu of options that can be customized to individuals presenting with the variety of symptoms seen in NREM parasomnias.

Limitations and future directions

As in any case series, the limitation of this report is that these 3 cases are a small sample of the number of parasomnia cases we see each year. A systematic study is needed to follow patients to study longer-term outcomes and factors associated with relapse. Furthermore, these 3 patients had no history of injury to self or others and they did not have symptoms that would suggest other sleep disorders such as sleep-disordered breathing that could be triggering parasomnia events. If the patients were at greater risk for injury, we would have considered referral for medications. However, only 1 of these patients (case 2) had self-referred directly to a behavioral provider, while the others had been evaluated first by a physician and elected behavioral treatment over medication. If symptoms of sleep-disordered breathing or other disorders were present, patients would have been referred for evaluation (including polysomnography if not already completed) and medical treatment.

This case series demonstrates the effective use of multi-component behavioral intervention to reduce NREM parasomnia in 3 young adults. The treatment was time effective (3–6 sessions) and integrated empirically supported cognitive behavioral techniques. Systematic study of long-term outcomes is needed, including randomized clinical trials comparing

pharmacological interventions with single or combined behavioral interventions. Future research should also consider development of behavioral treatment manuals to increase the scalability of this approach.

ABBREVIATIONS

CBT, cognitive behavioral therapy
CBT-I, cognitive behavioral therapy for insomnia
NREM, non-rapid eye movement

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