

## CASE REPORT

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### *Dream Enactment Behavior: A Documented Case Presentation with a Transition from Post Traumatic Stress Disorder to REM Behavior Disorder*

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#### ABSTRACT

Dream enactment behavior (DEB) contains the hallmark criteria for the diagnosis of REM behavior disorder (RBD), and it is attributed as the underlying mechanism with its distinct pathology and presentation. The recently described condition, trauma associated sleep disorder (TSD), is closely related to posttraumatic stress disorder (PTSD) and shares the same diagnostic criteria as RBD; however, they differ significantly in their underlying pathophysiology. The transition from one to another has not been described well and is only self-reported in the medical literature. This article describes a case study of a patient with a history of PTSD in remission who developed symptoms typical of idiopathic RBD unrelated to the patient's previous trauma. As RBD has not been well-studied within the general population, this case study is unique since the idiopathic RBD was captured via polysomnogram (PSG).

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#### KEYWORDS

Posttraumatic stress disorder(PTSD), Dream enactment behavior(DEB), Idiopathic REM behavior disorder (IRBD), REM behavior disorder(RBD), Trauma associated sleep disorder(TSD)

#### INTRODUCTION

This article will first review the definitions and diagnostic criteria for 4 closely related disorders to lay the conceptual foundation for this case study. The disorders are presented in the order in which the patient experienced them. Understanding these disorders is important to the case study as the patient experiences and transitions through the disorders.

#### POSTTRAUMATIC STRESS DISORDER (PTSD)

PTSD is a psychiatric disorder where the person affected has experienced, witnessed, or learned about an actual or threatened traumatic event.<sup>1</sup> To be diagnosed with PTSD, the person must show symptoms from 5 criteria set by the

Diagnostic and Statistical Manual of Mental Disorders (DSM-5) that have lasted for more than 1 month.<sup>2</sup> The 5 criteria include: Criterion A - stressor; Criterion B - intrusion symptoms; Criterion C - avoidance; Criterion D - negative alterations in cognition and mood; Criterion E - alteration in arousal and reactivity with 2 described subtypes: dissociative (no associated sympathetic activation) PTSD and complex (associated with repeated trauma) PTSD.<sup>2</sup> Around 70% of PTSD patients report sleep disturbances,<sup>3</sup> and 50% to 70% report recurrent nightmares.<sup>4</sup>

#### TRAUMA ASSOCIATED SLEEP DISORDER (TSD)

TSD is a newer-proposed parasomnia stemming from a person exposed to a traumatic experience



Abbreviation	Disorder
PTSD	Posttraumatic Stress Disorder
TSD	Trauma Associated Sleep Disorder
RBD	REM Behavior Disorder
DEB	Dream Enactment Behavior

**TABLE 1.** Definitions of Related Sleep Disorders

and displays clinical symptoms of trauma-related nightmares (TRN) under critical review.<sup>5</sup> Though the official criteria for TSD are not yet formally established or approved, leading researchers propose specific criteria based on the current, limited research on TSD.<sup>6</sup> There are 6 proposed criteria: Criterion 1 – onset after combat or other traumatic experience; Criterion 2 – history of dream mentation related to prior traumatic experience; Criterion 3 – self or witnessed reports of disruptive nocturnal behaviors (DNB) including 1 of the following: screaming, yelling, tossing, turning, thrashing, or combative behaviors such as hitting bed partner; Criterion 4 – symptoms of autonomic hyperarousal or polysomnogram (PSG) showing tachycardia, tachypnea, or diaphoresis occurring in association with rapid eye movement (REM) sleep without atonia or DNB, and not related to sleep-disordered breathing; Criterion 5 – PSG may show REM sleep without atonia where any EMF activity index is variable or dream enactment behavior in REM sleep; Criterion 6 – the absence of epileptiform activity (EEG) on PSG.<sup>6</sup>

### REM BEHAVIOR DISORDER (RBD)

Per the third edition of the International Classifications of Sleep Disorders (ICSD-3), RBD is a parasomnia where the diagnosis of RBD requires the presence of REM sleep without atonia (RSWA) documented on overnight polysomnography (PSG) in conjunction with repeated episodes of either sleep-related

injuries, potential injuries, or disruptive sleep behavior with or without sleep vocalization.<sup>7</sup> The adrenergic effects may also manifest symptoms such as gross motor movement, increased heart rate and respiratory rate, and sweating. In addition, these

symptoms occur in the absence of other sleep disorders, mental health issues, neurological disorders, medications, or substance use. RBD is a prodromal syndrome thought to be attributed to the underlying condition of alpha-synuclein neurodegeneration (dopaminergic abnormalities, cholinergic denervation).<sup>8,9,10</sup> The vast majority of RBD patients often also eventually demonstrate signs and symptoms of Parkinson's Disease and Lewy Body Dementia.<sup>9,10</sup> RBD occurs mainly in elderly males over the age of 50.<sup>7</sup> The most effective treatment is melatonin and/or clonazepam.<sup>11</sup>

### DREAM ENACTMENT BEHAVIOR (DEB)

Dream enactment behavior (DEB), such as kicking or thrashing in response to dream content during sleep, has been reported in people with diagnoses of PTSD, TSD, and rapid eye movement (REM) sleep behavior disorder (RSD).<sup>12</sup> With diagnostic criteria that overlap between PTSD (previous trauma, altered dream mentation, symptoms of autonomic hyperarousal such as tachycardia or diaphoresis) and RBD (dream enactment, PSG demonstrating REM sleep without atonia (RSWA), or DEB in REM sleep), the pathophysiology of PTSD and TSD is hypothesized to be related to autonomic hyperarousal leading to an overdrive phenomenon demonstrated as hyperactivity in the locus coeruleus (LC) which results in loss of REM atonia<sup>1,13</sup> and hyperadrenergic dysregulation.<sup>14</sup> Hence, improving symptoms with prazosin, an adrenergic blocker, could be useful in differentiating TSD from RBD.<sup>15</sup> Its effectiveness for the treatment of RBD also



suggests that the distinct phenotype of DEB may not entirely be related to idiopathic RBD.<sup>1</sup>

While most DEB cases are related to PTSD or TSD, once other diagnoses and medications are ruled out, there have been occurrences of a few cases where there is no identifiable underlying cause of RBD. These cases are unique from the original RBD diagnosis because the people exhibit most of the criteria except for exhibiting an adrenergic response where their heart and respiratory rates remain normal during sleep.

### CASE STUDY

The patient is a 50-year-old female diagnosed with PTSD in her 30s after finding a family member dying by suicide. Following that traumatic experience, the patient experienced typical PTSD symptoms, including nightmares. These nightmares were associated with frequent palpitations, sweating, and other sleep disturbances, including kicking and thrashing. Additionally, the patient described flashbacks with upsetting memories, negative thoughts

about herself, and feelings of isolation. She described feeling frequently irritated as well as symptoms of anxiety and depression. Her symptoms improved after treatment with cognitive behavioral therapy (CBT) and selective serotonin reuptake inhibitors (SSRIs). The patient has been symptom-free for the past 5 years, and she has been off SSRIs for the past 4 years.

Approximately 2 years ago, the patient started having “terrible dreams.” Her bed partner told the patient that she had been kicking, screaming, punching, and biting in her sleep. When she awakened, the patient had no recollection of the dream content, but she was sure these dreams did not resemble her PTSD nightmares. Additionally, these dreams were not associated with sweating or rapid heartbeat. She no longer takes medications and denies anxiety, tremors, or movement disorders. Her physical exam was unremarkable.

Her PSG was negative for obstructive sleep apnea (OSA), though the patient was noted to have episodes of arousal from REM sleep. She did not recall her dream content, and it was

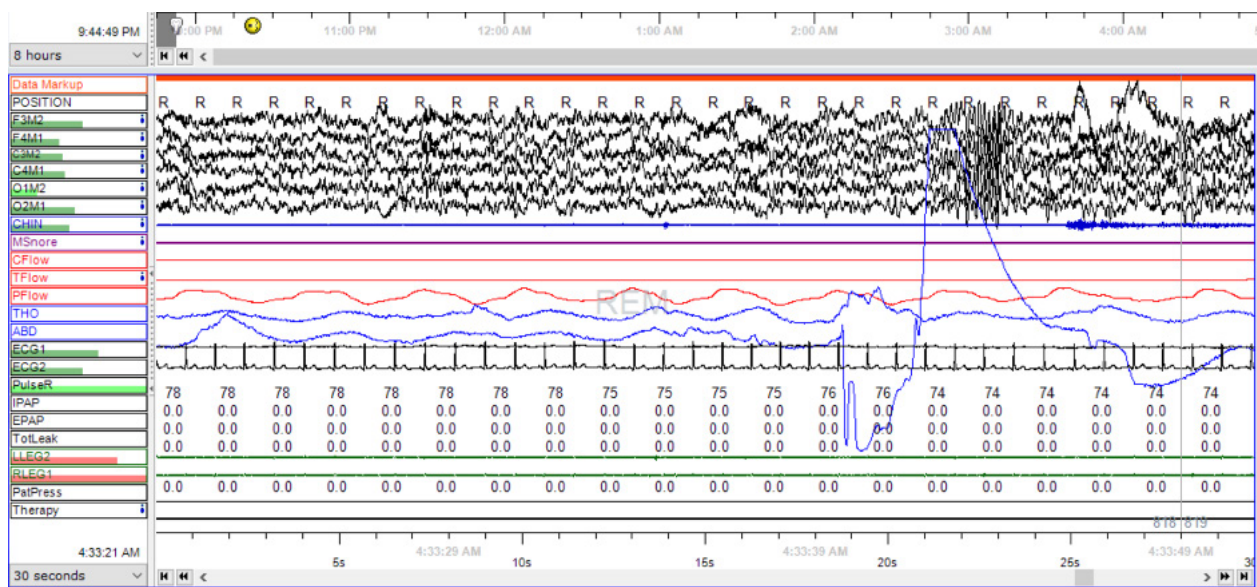


FIGURE 1. Sleep study showing an episode of REM sleep without atonia.



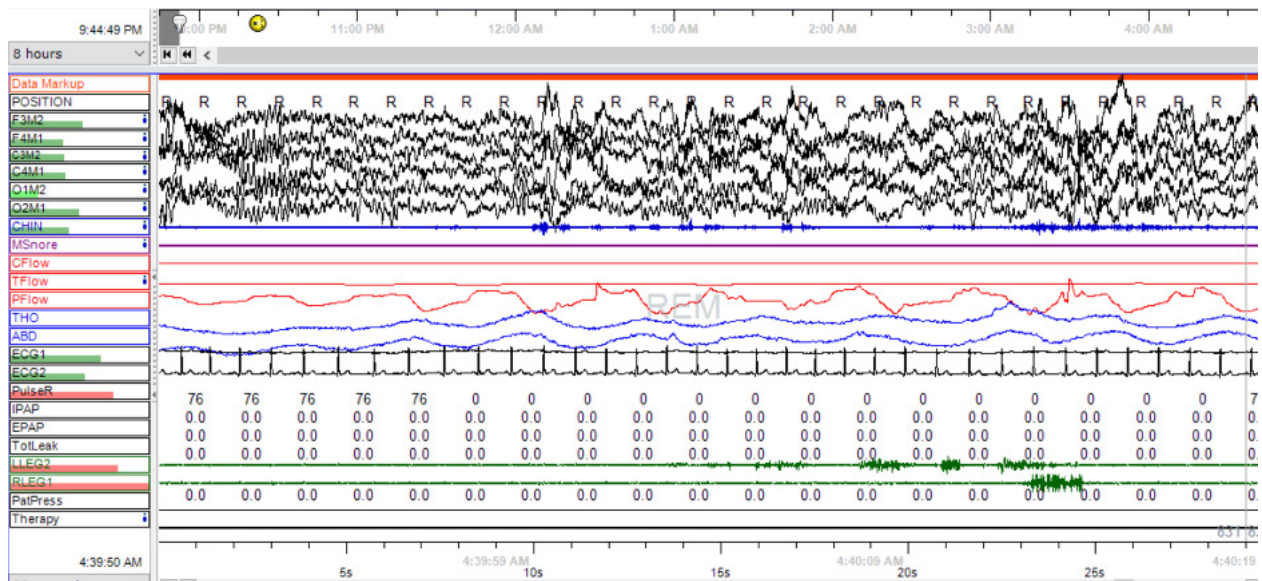


FIGURE 2. Sleep study showing REM sleep without atonia and leg kicking.

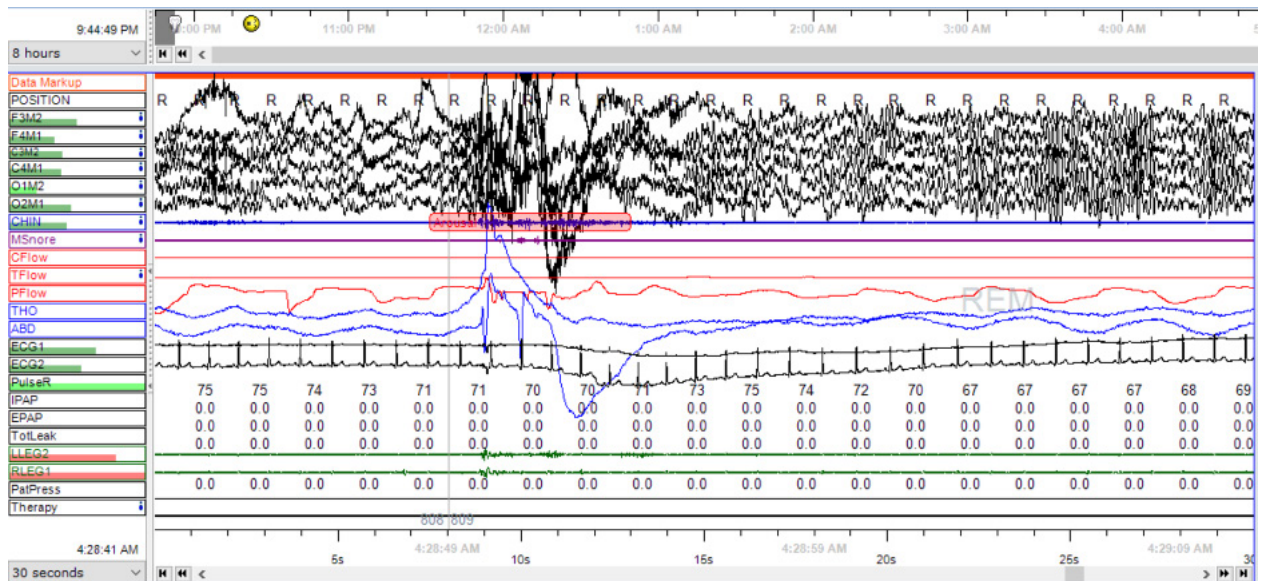


FIGURE 3. Sleep study showing arousal from REM sleep with leg kicking.



noted that she had no evidence of rapid heart rate during the episodes. (See attached graphs that show documented episodes of RSWA and dream enactment captured on PSG.)

The patient was successfully treated with clonazepam 0.5 mg at bedtime. Her nightmares subsided, and she no longer had DEB during sleep, as reported by her bed partner. The patient was followed for 2 years. Her clonazepam had to be increased to 1 mg at bedtime due to breakthrough DEB, and the patient continued to deny depression. Thus far, she has not developed any neurological disorders such as Parkinson's Disease or dementia.

## CONCLUSION

This case study described a typical patient with post traumatic stress disorder (PTSD) with associated nightmares and a hyperadrenergic response, currently in remission, that developed dream enactment behavior (DEB) without the associated hyperadrenergic response that is typical for dream enactment behavior (DEB) associated with PTSD. We recognize that the patient's symptoms also fit with the unofficial diagnosis of trauma associated sleep disorder (TSD). We hypothesized that the patient developed an idiopathic REM behavior disorder (RBD).

The etiology of DEB in PTSD is not well understood; however, it is suggested that when highly emotional dreams occur, there will be an increased adrenergic response and greater activation of the centers of the amygdala.<sup>16</sup> This relative overactivity may lead to the escape of normal REM sleep deactivation, whereas in idiopathic RBD, the etiology is related to a direct disruption of the brainstem nuclei (cholinergic neurons) that maintains the atonia of REM sleep.<sup>16</sup>

Over the years, research involving the veteran population has provided important insights regarding the association of the above-discussed disorders. It has been reported that PTSD increases the incidence of sleep disorders and other parasomnias in veterans without comorbid traumatic brain injury.<sup>11</sup> Additionally, the prevalence of RBD and related parasomnias is significantly higher in veterans than in the general population.<sup>17</sup> A number of sleep laboratory-documented cases of RBD have been studied within the veteran population, though not captured on video.<sup>17</sup> Therefore, RBD has not been studied well within the general population, which makes this case study unique since the idiopathic RBD was captured via PSG. It is currently not possible to say whether repeated traumas represent a risk factor for idiopathic RBD or whether RBD associated with PTSD is a distinct entity.<sup>6,18</sup> Continued studies are needed to determine whether the presence of DEB in patients with PTSD increases their risk for long-term neurodegenerative disorders.<sup>17,10</sup>

Given the distinct pathways for each parasomnia, the relative overactivity of the emotional centers of the amygdala leading to escapes from the normal REM sleep deactivation that occurs in PTSD-related DEB versus the neurodegeneration in idiopathic RBD causing reduced motor inhibition during REM sleep,<sup>16</sup> this case study exhibited the transition from one independent parasomnia (DEB related to PTSD related RBD) to another independent parasomnia (DEB related to idiopathic RBD) and was captured on PSG. Other studies have self-reported these occurrences, but this case study has documented evidence. We hypothesize that a diagnosis of PTSD may be a precursor to the diagnosis of a neurodegenerative disorder like RBD. We believe further investigation is necessary to evaluate the link between the hyperadrenergic nature of PTSD and the degenerative nature of idiopathic RBD.



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