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Sleep Disturbances in Posttraumatic Stress Disorder: Updated Review and Implications for Treatment

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Abstract

Sleep disturbances are common in adults with PTSD and range from insomnia and nightmares to periodic leg movements and disruptive nocturnal behaviors. Together these findings suggest profound disturbances in rapid eye movement (REM) and non-REM (NREM) sleep, although there is a lack of consensus regarding a distinct profile of objective sleep disturbances associated with PTSD. Prospective, longitudinal studies have established that sleep disturbances represent a risk factor for the development and course of PTSD, suggesting that sleep is an important neurobiological mechanism in the etiology and maintenance of this disorder. This research highlights the importance of early identification and treatment of sleep disturbances in at-risk and trauma exposed populations. A number of psychological and pharmacological treatments are effective at treating sleep disturbances in PTSD. Additional research is needed to further develop clinical guidelines informing when and how to integrate sleep-specific treatment with PTSD focused clinical care.

Prevalence and Impact of Self-reported Sleep Disturbances in Posttraumatic Stress Disorder

Sleep disturbances are commonly reported by patients with posttraumatic stress disorder (PTSD), along with associated distress and impairment during the day. The close link between trauma and sleep is reflected in the diagnostic criteria for PTSD, which include nightmares and sleep disturbances.[1] Sleep disturbances exponentially increase distress and dysfunction for these patients.[2] Patients with PTSD and self-reported sleep disturbances are more likely to report functional disability than those without sleep disturbances[2] and comorbid sleep problems may exacerbate existing PTSD symptoms and complicate recovery.[3]

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A large body of research has documented the significant association between self-reported sleep disturbances and PTSD,[4, 5] with estimates of up to 80–90% of patients with PTSD experiencing insomnia symptoms and 50–70% experiencing nightmares.[6, 7] The average frequency of nightmares based on retrospective measures has been estimated at greater than five per week.[8] In addition to nightmares and insomnia, other sleep disorders and disruptive nocturnal behaviors are prevalent among trauma-exposed individuals, including persons with PTSD. Sleep disordered breathing, periodic leg movement disorders, and other parasomnias are common in trauma-exposed samples.[9, 10] Disruptive nocturnal behaviors (DNBs) are also common among persons with PTSD.[11] These DNBs include night sweats, dysphoric dreams, simple and complex motor behaviors or vocalizations, including dream enactment. More recently, Mysliwiec and colleagues[12] described trauma-associated sleep disorder (TASD) involving trauma-related nightmare enactment associated with specific polysomnographic features, but distinct from REM behavior disorder. Together, these observations suggest profound disturbances of both REM and NREM sleep in adults with PTSD.

Evidence for Objective Sleep Disturbances in PTSD

Compared to the robust findings of subjectively disturbed sleep in patients with PTSD, evidence of objective sleep disturbances documented with polysomnography (PSG) and actigraphy is equivocal. Although some research suggests increased sleep fragmentation and awakenings among patients with PTSD, other studies find no difference between patients with PTSD and controls.[4] Meta-analytic findings suggest that PTSD is associated with more light sleep, less slow-wave sleep, and greater REM density,[13] although it is unclear to what extent these abnormalities are specific to PTSD compared to other mental disorders.[14] Despite REM abnormalities being conceptualized as a hallmark of PTSD, there is currently no commonly accepted profile of objectively disturbed sleep specific to PTSD.[5, 14] A recent study suggests that patients with PTSD experience more variable sleep and less uniform sleep disturbances compared to patients with primary insomnia,[15] possibly contributing to the difficulties of defining a specific profile of sleep disturbances in PTSD.

Mechanisms for Overlap of Sleep Disturbances and PTSD

Sleep disturbances are considered a modifiable risk factor for onset and relapse of mental disorders,[14, 16] suggesting a neurobiological mechanism by which disturbances in the sleep-wake cycle have downstream effects on PTSD symptoms. Sleep is often seen as crucial to healthy emotional regulation processes, including toning down the emotional charge of the memories.[17] Sleep disturbances could potentially hinder this process, resulting in an over-consolidation of the emotional component of memories and potentially contributing to PTSD symptoms, including intrusive thoughts and nightmares. Several studies have suggested that sleep disturbance impairs extinction learning, which may confer risk for the development of PTSD or perpetuate PTSD symptoms after a trauma.[18]

Diagnostic and Treatment Implications

Sleep disturbances in PTSD are sufficiently prevalent and severe to warrant routine screening and assessment in trauma-exposed populations as well as patients with PTSD. If sleep disordered breathing or parasomnias are suspected, laboratory studies can be used to document objective sleep disturbances. Insomnia or nightmares can be identified through clinical interviews and screening instruments. Once sleep problems are identified, targeted treatment planning and management is required. Sleep disturbances may be precipitated by trauma, but appear to transition into an independent condition that requires targeted treatment. A directional relationship has been found between sleep disturbances and PTSD. Sleep problems, particularly nightmares, do not remit following PTSD treatment.[19] Conversely, psychological sleep treatment appears to reduce PTSD symptoms,[20] highlighting the importance of targeted sleep treatment for patients with PTSD.

There are highly efficacious behavioral interventions available for both insomnia and nightmares. Cognitive behavioral therapy for insomnia (CBT-I) is effective in patients with a wide range of psychiatric and medical conditions, including PTSD.[21] Imagery rehearsal therapy (IRT), a form of cognitive therapy targeting nightmares, is recommended for treatment of PTSD-related nightmares.[22] Clinical trials have reported good results combining these therapies to simultaneously address nightmares and insomnia in patients with PTSD.[20] There are currently no clinical guidelines for sequencing or combination of PTSD and sleep treatments, but initial research suggests treating sleep could be a preparatory step for PTSD treatment.[23] In addition, improved sleep may enhance the efficacy of PTSD-focused treatments that involve cognitive processing and conditioned learning.[14]

Antidepressant medications including the selective serotonin reuptake inhibitors (SSRIs) and the selective norepinephrine and serotonin inhibitors (SNRIs) are used to treat daytime symptoms of PTSD.[24] Two SSRIs, paroxetine and sertraline are approved for daytime symptoms, though there is little evidence that they are better than other SSRIs. Often SSRIs and SNRIs worsen insomnia symptoms in patients with PTSD.[25]

The pharmacology algorithm project at the Harvard South Shore program recommended sleep evaluation and treatment first before the use of an antidepressant medication for the daytime symptoms of PTSD.[24] The authors argued that sleep disturbance is one of the core symptoms of PTSD and often a major source of distress. In addition, sleep deprivation may worsen core daytime PTSD symptoms.

Fluvoxamine is the only SSRI which showed improvement in “subjective sleep quality” in one study.[26] Zolpidem was also found to be useful for insomnia in patients with PTSD in a few case reports.[27] In a randomized placebo control study, eszopiclone showed greater improvement in PTSD symptoms including sleep disturbance.[28] Trazodone, an antidepressant is often used in low doses to treat insomnia in patients with depression and PTSD. In one study of Vietnam Veterans, trazodone improved sleep over a period of 2–3 months.[29]

Prazosin, an alpha 1 adrenoreceptor antagonist has been widely used to treat nightmares in patients with PTSD.[24] In the first placebo controlled trial of prazosin in patients with Veterans with nightmares related to PTSD, there was a decreased in nightmares and an improved quality of sleep.[30] Prazosin is generally well tolerated, but can cause hypotension and dizziness. Prazosin must be administered regularly to avoid recurrence of nightmares. Prazosin is the only pharmacological intervention that is recommended by the American Academy of Sleep Medicine for the use in treatment of nightmares.

Conclusions

The prevalence and associated distress of sleep disturbances comorbid with PTSD highlights the need for mental health providers and sleep clinicians to collaboratively provide evidence-based treatment for trauma-exposed populations. Continuing to educate providers about the effect of trauma on sleep and best practice guidelines for treatment of sleep disturbances in PTSD will be crucial for improving sleep in trauma-exposed populations and potentially improving non-sleep-related symptoms.

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Table 1

Sleep Disturbances Associated with PTSD

• Insomnia
• Nightmares
• Sleep-disordered breathing
• Periodic leg movements
• Disruptive nocturnal behaviors (night sweats, dysphoric dreams, vocalizations and dream enactment)

Table 2

Targeted Treatments for Sleep Disturbance in PTSD

Psychological Treatments
• Cognitive Behavioral Therapy for Insomnia (CBT-I) • Imagery Rehearsal Therapy (IRT) for nightmares • Combination of CBT-I and IRT
Pharmacological Treatments
• Hypnotic medications e.g; Eszopiclone or Zolpidem to treat insomnia • Prazosin to treat nightmares