Sleep Disorders among Veterans with PTSD

Sadeka Tamanna, MD, MPH.
Medical Director,
Sleep Disorders Laboratory,
G.V.(Sonny) Montgomery VA Medical Center, Jackson, MS.
Learning objectives

• **Sleep problems** among veterans with post traumatic stress disorder (PTSD).
  – **Insomnia**: clinical presentation, diagnosis and treatment among veterans with PTSD.
  – **Obstructive sleep apnea**: presentation, diagnosis and treatment options among veterans with PTSD.
Poll questions

What is your role in treating veterans with PTSD?

- A. Clinician
- B. TBI Physician
- C. Psychologist
- D. Social worker
- E. Case manager
Poll Question

In your experience, is “sleep” a challenge for PTSD sufferers?
• 1. Yes
• 2. No

In your regular practice, do you routinely ask the patients how well they sleep at night?
• 1. Yes
• 2. No
Poll Question

• A 55 year old veteran with chronic PTSD came in complaining his sleep is getting worse with repeated awakening with nightmares and panic attacks, waking up with headache, feeling very tired and sleepy during the day. His wife complains that he is awake most of the night and when he falls asleep, he snores loud, stops breathing during sleep. He is compliant with all his medications. What is your next step in management?
Poll question- answers

• 1. Adjust his anti-depressant medications
• 2. Send for psychotherapy
• 3. Ask to follow with primary care provider
• 4. Request sleep consult for sleep study
Post traumatic stress disorder

- PTSD is an anxiety disorder that develops in response to severe traumatic life stress. Studies have shown that certain type of trauma like combat, rape and other form of assaultive violence are more likely than others to result in PTSD.
- Lifetime prevalence of PTSD in the community is around 5-6% compared to 15-31% among veterans.
- The syndrome of PTSD puts a heavy toll on the quality of life of the individual and society.
Sleep among PTSD sufferers

• 70% to 90% patients with PTSD suffer from sleep disturbances.

• PTSD sufferers have much higher prevalence of insomnia, nightmares, restless sleep and also sleep related breathing disorders like obstructive sleep apnea when compared to healthy cohorts.

• Specific sleep treatments for sleep disturbances in this population lead to significant improvement in sleep and global PTSD symptoms.
Sleep difficulties after combat
Sleep Cycle

In stage 1 we experience a light transitional sleep. This is where drowsiness and sleep begin.

Stage 1

In stage 2 more stable sleep occurs. Chemicals produced in the brain block the senses making it difficult to be woken.

Stage 2

REM

REM sleep revitalizes the memory. In this stage brain activity is very high and intense dreaming is likely to occur.

Stage 3

90-120 Minutes

Stage 3 is deep sleep. Growth hormone is released during this stage. Most stage 3 sleep occurs in the first third of the night.
Insomnia

- Difficulty in initiating and maintaining sleep resulting in daytime functioning impairment is termed as insomnia.

- In a recent study of 110 military personnel who returned from combat, 88.2% were diagnosed with sleep disorders. Among the sleep disorders, 63.6% met the criteria for insomnia and 62.7% met diagnostic criteria for obstructive sleep apnea.  

How to diagnose insomnia

• 1. Subjective assessment:
  • By clinical interview with self report questionnaires like Insomnia severity index (ISI)
  • Pittsburgh sleep quality index, or Epworth sleepiness scale.
Diagnosis and treatment of insomnia

- Objective assessment:
  - Sleep diary
  - Actigraphy
  - Polysomnography
  - No objective tools are recommended for diagnosis of insomnia.
Treatment of Insomnia

• Sleep Hygiene
• Cognitive behavioral therapy
• Pharmacological treatment
• Treat other causes triggering insomnia like anxiety, depression or sleep disordered breathing like obstructive sleep apnea.
Sleep Hygiene

- Keep regular bedtime and waking time, avoid spending excessive time in bed.
- Avoid use of sleep disrupting products
- Avoid caffeine, alcohol, nicotine before bedtime
- Avoid exercise 2 hours prior to bedtime
- Avoid stimulating activities close to bedtime
- Avoid watching television, reading, snacking in bed
- Avoid use of bed for activities other than sleep
- Maintain a comfortable sleeping environment
- Keep the bedroom quiet and cool.
Hypnotic indicated insomnia

BzRA/Melatonin receptor agonist Ramelton

Not improved:
- Increase dosages of BzRA or change alternative BzRA

Improved:
- BzRA+Sedative anti-depressant
- Continue

Zaleplon/Zolpidem/Eszopiclon/Temazepam
Hypnotics used in insomnia

- Ramelteon: Melatonin receptor agonist (MT1 and MT2), 8 mg 30 min before sleep.
- Benzodiazepine receptor agonist: Eszopiclone, zaleplon, zolpidem, flurazepam, temazepam, triazolam

- Trazodone: serotonin receptor antagonist and reuptake inhibitor (SARIs), most commonly used antidepressant and hypnotic agent.
- National use of prescription medication showed that Zolpidem and Trazodone were the two most commonly used med for insomnia from NHANES data.

Hypnotics used for insomnia in PTSD

- Anti-depressants: Selective serotonin reuptake inhibitors (SSRI) like Sertraline, Fluoxetine, Paroxetine.
- Some antidepressants improve sleep disruption in PTSD where as others are less beneficial and can cause adverse sleep events.
- Some anti-depressants can cause REM suppression and sleep fragmentation.
- SSRI and Venlafaxine have been found to exacerbate periodic leg movements during sleep.
Non-pharmacologic treatment

• Cognitive behavioral therapy specifically designed for PTSD related insomnia:
• Primary insomnia strategy:
• Sleep hygiene
• Sleep restriction
• Stimulus control

• Imagery rehearsal therapy (IRT)
• These sleep treatments may benefit patients with trauma related nightmares and insomnia.
Obstructive sleep apnea

- Prevalence of OSA is higher among veterans with PTSD than those without PTSD.
- 47.6% of combat veterans with PTSD was found to have OSA compared to 12.5% of healthy controls. ³
- There is a complex relationship between hyper-arousal from PTSD, insomnia and respiratory disturbance generated by special neuro-endocrine connections which are being explored in different basic and clinical studies.

Symptoms of OSA

• Loud snoring
• Observed apneas—stopping breathing during sleep observed by someone
• Gasping/choking during sleep
• Day time sleepiness
• Excessive fatigue/tiredness not explained by other diseases
• Morning headaches
• Uncontrolled hypertension
Give me a break!
Diagnosis for sleep apnea

• **History**: Sleep hygiene, hypersomnolence by EPWORTH sleepiness score, observed breathing pauses, snoring

**Physical Examination**: neck size, mandibular position, oropharyngeal examination with Mallampati Score

• **Overnight Polysomnography** (Gold standard)
Mallampati Score

- Scoring is as follows:
  Class 1: Full visibility of tonsils, uvula and soft palate
  Class 2: Visibility of hard and soft palate, upper portion of tonsils and uvula
  Class 3: Soft and hard palate and base of the uvula are visible
  Class 4: Only Hard Palate visible
Oropharyngeal examination
Sagittal section of a normal vs. OSA patient
What is polysomnography?
What is apnea?

- Complete cessation of airflow for 10 seconds or more during sleep is called apnea.
What is Hypopnea?

- Reduction of airflow by 50% with 4% reduction of oxygen saturation is termed as hypopnea.
- Total number of apnea and hypopnea per hour of sleep is calculated to generate apnea hypopnea index (AHI).
Diagnosis of OSA

• Three categories of OSA:
  • 1. Mild: AHI 5-15 with symptoms
  • 2. Moderate: AHI 15-30
  • 3. Severe: AHI >30
Treatment of OSA

• Continuous positive airway pressure therapy (CPAP) or Bi-level positive airway pressure therapy (BiPAP) is the gold standard of treatment for OSA.

• Surgical correction for increasing the oropharyngeal space is also used for therapy.

• Dental appliances and maxillofacial advancement are available therapy to use for OSA.
CPAP/BiPAP

Sleeping with CPAP/BiPAP

How does it work?

- CPAP Acts as an Airway Stent
  - 0 cm H₂O
  - 5 cm H₂O
  - 10 cm H₂O
  - 15 cm H₂O

Courtesy Richard Schwab, M.D., UPENN
How does CPAP/BiPAP help?

How does it help?

• Keeps airway open during sleep.
• Snoring and apneas should not happen or improve.
• Oxygen saturation during sleep will be normalized.
• Improves daytime sleepiness/tiredness
• Improves HTN

Reduces risk of diseases

• Improves neurocognitive functioning.
• Improves alertness.
• Reduces risk of cardiovascular diseases.
• Reduces motor vehicle accident
• Reduces headaches
A randomized trial on 118 men with severe OSA treated with optimal CPAP and sub-therapeutic CPAP showed significant reduction in both SBP and DBP after 1 month in optimally treated group.
Improves Heart failure

- 88 patients with heart failure was grouped into CPAP treated and untreated group and their cumulative event-free survival was calculated over 25 months. The cumulative event-free survival was significantly lower in untreated patients than in CPAP-treated patients ($p = 0.001$ [log-rank test]).

<table>
<thead>
<tr>
<th>Numbers at Risk</th>
<th>Treated</th>
<th>untreated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Months</td>
<td>65</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>
Effect of CPAP on PTSD

• Improves nightmares
• Improves neurocognitive functioning and memory
• Improves insomnia and maintenance of sleep through the night.
• Treatment of co-morbid OSA alleviates PTSD symptoms
• Reduces night terrors, periodic leg movements and panic attacks during sleep.
Nightmares improve with CPAP

• Treatment of sleep apnea with CPAP has shown improvement on nightmares and PTSD symptoms in a retrospective study by Krakow and his colleagues in 2000.

• We retrospectively reviewed 69 veterans with PTSD at Jackson VAMC at MS and found a significant improvement in number of nightmares among PTSD sufferers who have used CPAP for their co-morbid OSA.

  • Krakow et al. A retrospective study in improvement in nightmares and PTSD following treatment of co-morbid sleep disordered breathing. Journal of Psychosomatic research, 2000
  • Tamanna et al. CPAP therapy reduces nightmares in veterans with PTSD and sleep apnea, AASM meeting, 2013.
CPAP compliance among PTSD

- CPAP compliance is very poor among veterans with PTSD
- CPAP adherence was compared between PTSD and non-PTSD group among veterans by El-Solh et al. in VAMC at New York. Veterans with PTSD were only 41% compliant compared to veterans without PTSD who were 70% compliant for CPAP use.
- Claustrophobia is a major barrier for compliance among this group.

(El-Solh AA, Ayyar L, Akinnusi M et al. Positive airway pressure adherence in veterans with PTSD. SLEEP, 2010)
CPAP compliance

- Documentation of PAP therapy ( >4 hours per night for 70% of the night in 30 consecutive days ) is considered compliant by CMS.
- CPAP compliance has shown to improve to 86% by using a designated team of personnel for trouble shooting and fixing the issues.
- First 2 weeks compliance can predict the overall compliance of the patient.
Improving Compliance among PTSD veterans

• CPAP mask fitting and follow up with sleep provider are important.
• Offering different masks for trial will give them more options to try.
• Nasal masks and nasal pillows seem to work better for this group.
• Cognitive behavior therapy (CBT) for CPAP use has been found to be effective among non-compliant patients.

References:

References and sources

- Krakow et al. A retrospective study in improvement in nightmares and PTSD following treatment of co-morbid sleep disordered breathing. Journal of Psychosomatic research, 2000
- Tamanna et al. CPAP therapy reduces nightmares in veterans with PTSD and sleep apnea, AASM meeting, 2013.