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Trauma associated Sleep Disorder: A Case Series

Matthew S. Brock, MD

Major, USAF MC

Chief, San Antonio Military Health System Sleep Disorders Center

Disclaimer

- *The views expressed are those of the presenter and do not reflect the official views or policy of the Department of Defense or its Components*
- *The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02_AFI 40-402*

Trauma associated Sleep Disorder

- The onset of profound sleep disturbances after trauma has long been recognized…

Lucretius' poem, De Rerum Natura (50 BC):

"Again, the minds of mortals …
Often in sleep will do and dare the same
In manner like. Kings take the towns by storm,
Succumb to capture, battle on the field,
Raise a wild cry as if their throats were cut
Even then and there. And many wrestle on
And groan with pains, and fill all regions round
With mighty cries and wild, as if then gnawed
By fangs of panther or of lion fierce.
Many amid their slumbers talk about Their mighty enterprises…
Many meet death; many, as if headlong
From lofty mountains tumbling down to earth
With all their frame, are frenzied in their fright;
And after sleep, as if still mad in mind,
They scarce come to…

Unexplained Clinical Findings in Combat Veterans

Constellation of:

1. Nightmares
   a. With and without dream recall
2. Disruptive nocturnal behaviors
   a. Combative behaviors
   b. Vocalizations
   c. Somnambulism
3. Autonomic hyperactivity
   a. Night sweats
   b. Racing heart

Netter's Internal Medicine 2009.

Proposed Diagnostic Criteria for TSD

1. Onset after combat or other extreme traumatic experience
2. A history of altered dream mentation that is related to prior traumatic experience
3. Self or witnessed reports of disruptive nocturnal behaviors (DNB) to include at least one of the following:
   a. Abnormal vocalizations
      i. Screaming or yelling
   b. Abnormal motor behaviors in sleep
      i. Tossing, turning, or thrashing
      ii. Combative behaviors such as striking bed partner
4. Symptoms of autonomic hyperarousal or polysomnogram (PSG) monitoring demonstrates one of the following:
   a. Tachycardia
   b. Tachypnea
   c. Diaphoresis
   d. If documented on PSG, these findings occur in association with rapid eye movement (REM) sleep without atonia or DNB, and are not due to sleep disordered breathing
5. PSG may demonstrate:
   a. REM sleep without atonia; "any" EMG activity index is variable
   b. Dream enactment behavior in REM sleep
6. Absence of electroencephalographic (EEG) epileptiform activity on PSG

Case Series

Methods:

- Patients evaluated in our sleep center from December 2015 through May 2017
- The diagnosis was made if the patient developed the following after trauma:
  - Altered dream mentation related to the traumatic event
  - Disruptive nocturnal behaviors (DNB) with symptoms of hyperarousal
  - REM sleep without atonia on polysomnogram (PSG)
- Clinical history, PSG data, and questionnaires were reviewed
- During PSG review, when RWA present:

1. Video PSG review
2. Heart rate analysis (associated increases in HR by 10 or more beats per min)
3. DNB was adjudicated using RBD severity scale

REM sleep behavior disorder severity scale

Motor Events

0. = no visible motor activity, RWA present
Only definition criteria of RWA according to ICSD are fulfilled, no other phasic muscle activity in the limbs or face is visible or obvious on recording.

1. = small movements or jerks
Isolated, single hand or foot movements or facial jerks visible, restricted to the distal extremities and/or face.

2. = proximal movements including violent behavior
Single movements or series of movements including proximal extremities, no change of position.

3. = axial movements including bed falls
Movements with axial involvement and/or change of body position, falls.

Vocalizations

0. = no vocalization
Snoring with some sound may be present and should be differentiated from REM-associated vocalization.

1. = all sleep associated sounds other than respiratory noises
Talking, shouting, murmuring, laughing or screaming, either tonic or phasic, are present during at least one REM episode.

Sixel-Doring et al. JCSM, Vol. 7, No. 1, 2011

Demographics and Clinical Characteristics

	TSD Patients (n = 21)
Age, yr	38.7 (27-57)
Sex, male/female	17/4
Branch of service (USAF/Army)	10/11
BMI	28.5
Pittsburgh Sleep Quality Index	15
Epworth Sleepiness Scale	14
Insomnia Severity Index	21
Current antidepressant use	11
Current sleep aid use	11
Diagnosis of PTSD	16
Diagnosis of TBI	9
Previously deployed	19

Values are expressed as a mean

PSQI and PSQI-A Scores

During the past month, how often have you had trouble sleeping because you have…	Score 0 = not during past month 1 = less than once a week 2 = once or twice a week 3 = three or more times a week
Had bad dreams	2.7

During the past month, how often have you had trouble sleeping because you have…	Score 0 = never 1 = not during past month 2 = less than once a week 3 = once or twice a week 4 = three or more times a week
Had memories or nightmares of a traumatic experience	3.4
Had episodes of terror or screaming during sleep without fully awakening	2.8
Had episodes of "acting out" your dreams, such as kicking, punching, running, or screaming	2.75

Values are expressed as a mean

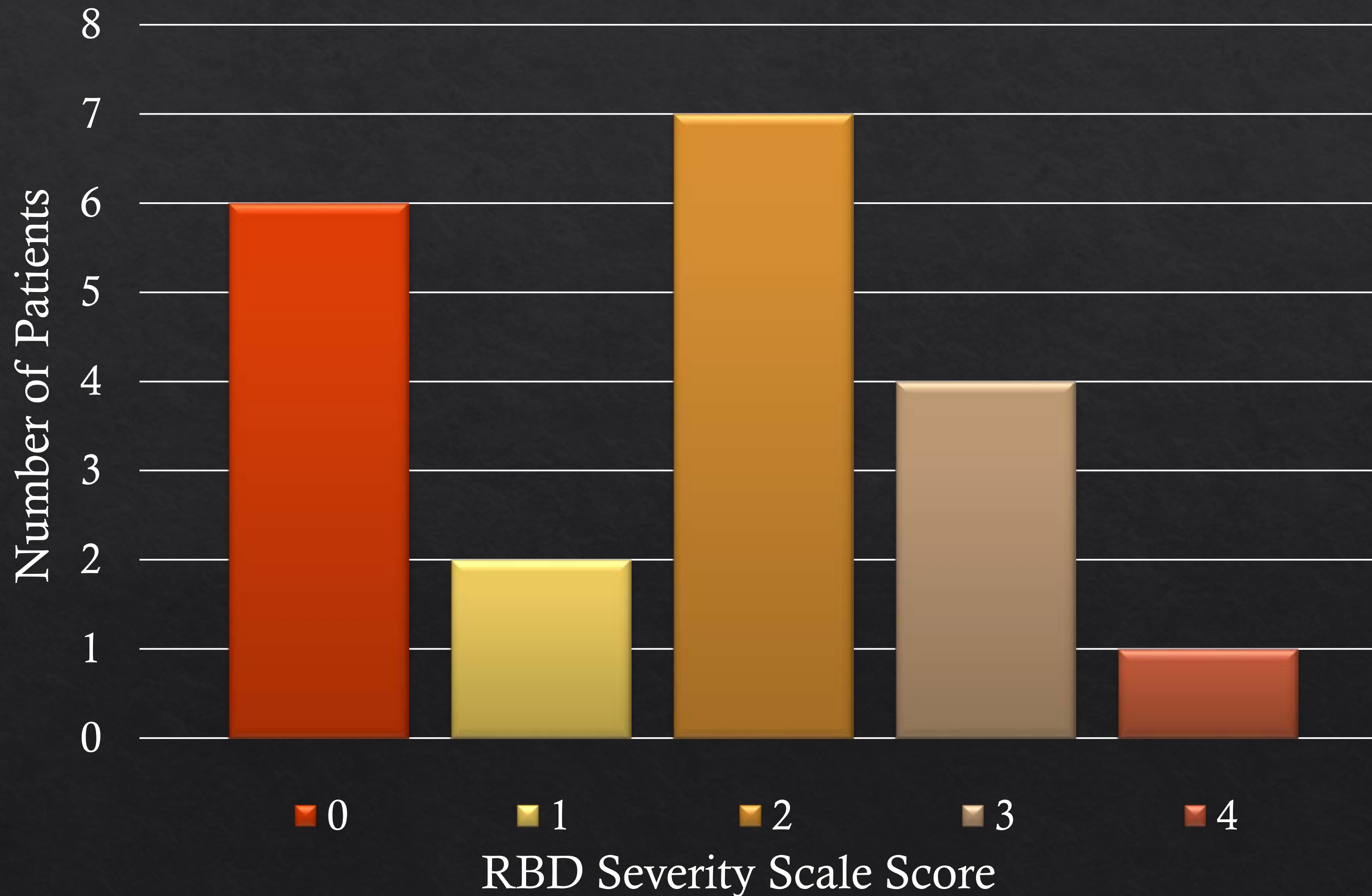
Reported Nightmares and Disruptive Nocturnal Behaviors

Patient	Nightmares	DNB
1	Incoming mortar attacks	Screaming, shaking violently, jumping out of bed and running
2	Mutilated bodies, confirming enemy combatant deaths, shooting a dog in the head ("pest control")	Thrashing/falling out of bed, slapping and kicking spouse and dog
3	Incoming grenades (being thrown over base wall)	Defensive posturing, trembling, vocalizations
4	Mortar attack, handling mutilated bodies (plane crash and blast after which patient held a soldier dying of shrapnel injury), prison break in which Taliban soldier rushed patient and was shot/killed 20 feet away from patient	Thrashing, kicking, vocalizations ("he is coming at me", "get down")
5	Patient being chased by former spouse; physical/verbal abuse	Vocalizations (garbled), defensive posturing
6	Being chased by enemy combatants, seeing dead bodies, falling off a bridge after a blast	Punching, kicking, occasionally falling out of bed, vocalizations ("I will f***ing kill you", "leave me the f*** alone", "get the f*** away from me"

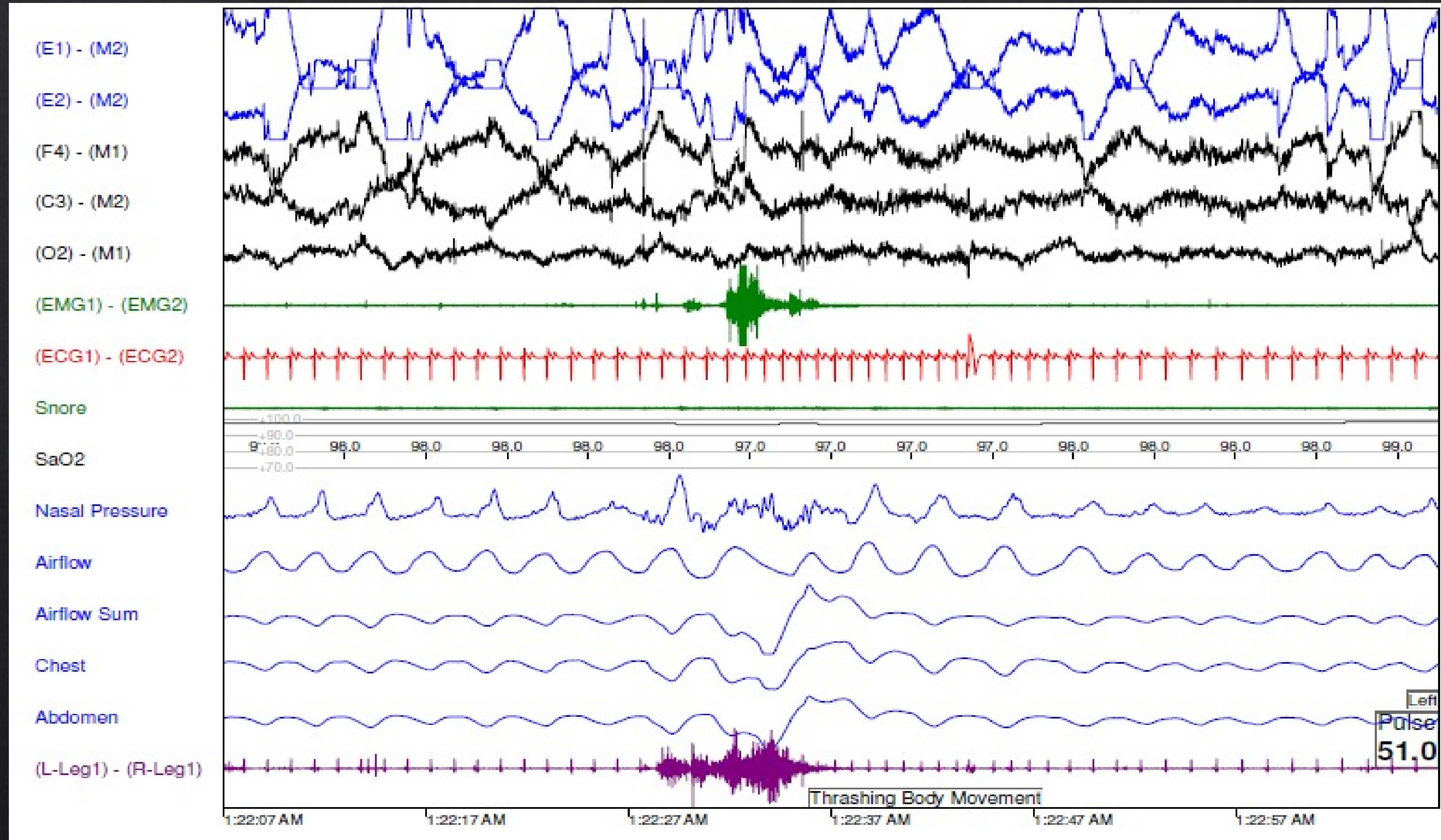
PSG Data

Variable	Value (n = 21)
Total sleep time, min	326.8
Sleep latency, min	24.7
Sleep efficiency, %	80.7
Wake after sleep onset, min	65.2
Apnea hypopnea index, n/h	8.5
Arousal index, n/h	21.1
Stage N1, %	12.7
Stage N2, %	56.9
Stage N3, %	12
Stage REM, %	18.4
REM sleep without atonia observed	21 patients
Disruptive nocturnal behavior (DNB) observed	14 patients
Vocalization heard	1 patient
RBD severity scale score, average	1.6
Heart rate increase $\geq$ 10 bpm associated w/RWA	10 patients

Disruptive Nocturnal Behaviors on PSG



31 y/o soldier with nightmares and dream enactment developing after deployment to Iraq…



TSD with or without OSA

Variable	OSA (n = 10)	Non-OSA (n = 11)
AHI, n/h	14.7	2.8
Stage REM, %	16.8	19.9
REM sleep without atonia observed	10	11
Disruptive nocturnal behavior (DNB) observed	5	9
Vocalization heard	0	1
RBD severity scale score, average	0.3	2.1
Heart rate increase $\geq$ 10 bpm associated w/RWA	5	5

Treatment of TSD: A Multi-faceted Approach

- 11 patients treated with prazosin
  - 7 reported reduction in frequency and/or severity of nightmares and DNB (dose range 1-11mg)
  - 3 discontinued due to side effects
  - 1 reported no improvement
- Safe sleeping practices
- Comorbid sleep disorders:
  - 14 patients referred to sleep psychology for treatment of insomnia
  - All OSA patients (n = 10) treated with positive airway pressure therapy
- Underlying behavioral health conditions (PTSD, depression, anxiety) addressed by psychiatry/psychology

Conclusions

- Our findings support TSD as a distinct REM related parasomnia
  - Onset after trauma
  - Nightmares related to traumatic experience with or without DNB
  - Relative tachycardia
- A single PSG does not necessarily document disruptive nocturnal behaviors
- Prazosin, in combination with treatment of comorbid sleep disorders, appears to reduce nightmares and disruptive nocturnal behaviors
- TSD is a complex, multi-faceted disorder

The Way Forward

- Inquire about nightmares after the PSG
- Studying patients for multiple nights in the lab
- Follow-up PSG after OSA is treated
- Consider stopping antidepressants in select patients

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