Sleep Disorders in Military Veterans of Operation Iraqi Freedom and Operation Enduring Freedom

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Daniel M. Williams, MD
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Overview

- Sleep disorders in veterans
- Highlights from sleep research
- A clinical approach
- Opportunities for sleep labs
Sleep Disorders in Veterans

- The military leverages sleep deprivation
  - Patrols
  - Guard duty
  - Raids
  - Strategic planning
Sleep Disorders in Veterans

- Insomnia
- Trauma-related nightmares
- Obstructive Sleep Apnea
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Sleep Disorders in Veterans
Harvard Study: Insomnia

The average amount of veteran participant sleep was 5.6 hours. 76% of veterans report that they do not typically get enough sleep. Even more alarming, 91% of the veterans surveyed reported often feeling tired, fatigued or sleepy during the day. “Having trouble falling or staying asleep” was by far the most frequent reason cited by veterans as a cause of not getting enough sleep (70%). Other common reasons included: “sleep is poor quality” (53%), “being too busy with work or family responsibilities” (13%), “being a night owl” (12%), and “liking to watch television late at night” (8%).

Importantly, 74.3% of respondents reported meeting general clinical criteria for insomnia (i.e., trouble falling asleep or staying asleep, 3 or more nights per week for at least a month with at least some significant sleep-related daytime symptoms). In the general population, the prevalence of chronic insomnia is 10-15%. Veterans who had actively engaged in combat were also more likely to report insomnia than those who had not actively engaged in combat (78.7% vs. 69.2%)
Sleep Disorders in Veterans: Insomnia

- PolyTrauma Triad:
  - Pain
  - Post–Traumatic Stress
  - Traumatic Brain Injury
Sleep Disorders in Veterans: Insomnia

- A chart review was conducted for 200 Operation Enduring Freedom/Operation Iraqi Freedom veterans evaluated at a polytrauma outpatient clinic.

- Sleep disturbance was highly prevalent (93.5%) in this sample, in which the majority of traumatic brain injury diagnoses were mild.

- Traumatic brain injury was not associated with sleep disturbance.
Sleep Disorders in Veterans: OSA

- Between 2008 and 2010, the number of veterans who received medical benefits related to sleep apnea grew by 61 percent
  - 39,145 cases in 2008
  - 63,118 cases in 2010

http://www.huffingtonpost.com/david-volpi-md-pc-facs/veterans-sleep-apnea_b_2082960.html
NORMAL STRESS

- Frontal lobe tells amygdala “it’s ok”
- Overrides permanent emotional memory
TRAUMA

1. Frontal lobe can’t override the core brain
2. Hippocampus encodes the amygdala
   - Sensory data recorded
   - Permanent
3. Amygdala activates your system
   1. Vital signs
   2. Dreams
Sleep Disorders in Veterans: Trauma–Related Nightmares

- Most with PTSD experience nightmares.
- Associated with adrenaline.
- Prazosin calms the nervous system, but the emotional memory is stored in the amygdala.
Sleep Research

- Epworth Sleepiness Test
  - Measures propensity to doze sleep
  - Subjective measure of sleepiness
  - Rate how likely you are to doze in different scenarios
  - Well validated

- Multiple Sleep Latency Test
  - 5 naps after a night sleep study, >10 min normal
  - Best at evaluating sleep onset

- Maintenance of Wakefulness Test
  - Objective measure
  - Pilots stay awake for 20 minutes
Determinants of Sleep

- Homeostatic & circadian factors
- Medications

Sleep drive

Level of arousal

- CNS and physiological arousal
- Circadian factors
- Medications
- Environment

Sleep Tendency
Entrainment

- Matching the Circadian rhythm to sleep-wake cycle

- Desynchronosis: when these are disrupted
  - Malaise
  - Fatigue
  - GI distress
  - Mood disorder
Function of Sleep

- Restoration of Somatic Growth Theory
  - Anabolic processes
  - Secretion of Growth Hormone in Stage N3

- Metabolic Growth
  - Energy conservation
  - Temperature drops during sleep
  - Removal of toxins – brain wash
    - Primarily adenosine
Function of Sleep

- Neural Growth and Processing Theory
  - Neuronal synaptic plasticity
  - Brain development
  - Learning and memory consolidation
Following 1 night of total sleep loss:

- 1/3 of lost sleep will be made up
- All of the Stage 3, slow wave sleep
- ½ of the REM
- Sacrificing Stage 2 sleep
Total Sleep Deprivation

- Irritability
- Poor concentration
- Sleepiness
- Irritable bowel symptoms
- Microsleeps
Total Sleep Deprivation: a health problem?

- Leptin – anorexigenic hormone
- Ghrelin – orexigenic hormone
- Sleep debt causes decrease in Leptin and opposite in Ghrelin

- 2 days of sleep restriction
  - 18% drop in Leptin levels
  - 28% increase in Ghrelin levels
  - Increased hunger and desire for carbs
Sleep Debt & Other Hormones

- Cortisol, adrenal gland
- Thyrotropin, pituitary gland
- Thyroxine, thyroid gland

*all significant*
Sleepiness
  ◦ Pretty obvious definition

Fatigue
  ◦ Inability to perform at 100%
Approaches to Fatigue

- Caffeine early, avoid late in the day
- Strategic napping
- “Catch up” on sleep
- Maintain Circadian entrainment
- Medications for shift work
  - Melatonin
  - Armodafinil
  - Modafinil
How much caffeine in a cup of Starbucks?

- Home brew 95 mg
- Café Latte 150 mg
- Cappucino 150 mg
- Brewed Coffee 330 mg
Strategic Napping

- 1–2 naps during your shift work
- No more than 20 minutes
- Avoid sleep inertia
  - Waking up in slow wave sleep

- If you NEED a longer nap, do 90 minutes and wake up during REM
  - Non-essential muscles paralyzed
  - Respiratory, brain activity, temperature – normal
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A Clinical Approach

1. Sleep hygiene, weight lifting
2. Benadryl and/or melatonin
3. Trazodone – an SSRI weak antidepressant used for sleep at lower doses
4. Benzodiazepines
   - Worsens sleep after 6–12 months
   - Doubles risk of dementia
   - Falls, wrecks, DUIs
   - Suppressed intelligence / IQ
5. Seroquel
   - Metabolic syndrome
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Opportunities for Sleep Labs

- What do all these veterans need?
‘After slicing its glut of pending claims from a peak of 600,000 cases in March 2013 to 400,000 in November, the VA has been unable to budge below that threshold this year, according to "The Red Tape Report," authored by the group Iraq and Afghanistan Veterans of America.’

Opportunities for Sleep Labs

- VA
- Vet Centers
- Advocacy groups
- Government contracts
- Military outprocessing centers on bases and reserve component
- Research studies
References


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