HEALTHCARE AND PRESCRIPTION OPIOID USE IN VETERANS WITH PERSISTENT POST-CONCUSSION SYMPTOMS, PTSD, AND CHRONIC PAIN

IntNSA Webinar Series

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Conflict of Interest
None to declare.
Objectives

- Provide background on co-occurrence of persistent post-concussion symptoms, PTSD, and chronic pain in Veterans
- Review recent literature on healthcare utilization, pain management, and prescription opioid use in this population
- Discuss clinical considerations for pain management strategies in Veterans with these conditions

Background

Common Conditions in OEF/OIF Veterans

- TBI History 7-23%
  (Carlson et al., 2011; Hoge et al., 2008; Joyner et al., 2009; Taylor et al., 2012; Tanielian & Jaycox, 2008)
- PTSD 11-42%
  (Grieger et al., 2006; Hoge et al., 2004; Lapierre et al., 2007; Tanielian & Jaycox, 2008)
- Depression 12-31%
  (Kovler et al., 2012; Seed et al., 2009; Vanderploeg et al., 2007)
- Chronic Pain 23-47%
  (Schade et al., 2006; Wiesner et al., 2009; Oto et al., 2011)
- Alcohol/Substance Misuse 5-40%
  (Burnett-Zeigler et al., 2011; Colman et al., 2009; Bose et al., 2012; Oto et al., 2011; Wiesner et al., 2009; Wilkins et al., 2007)
TBI

- Vast majority of TBIs are mild (ACRM, 1993; Howe, 2009; Iverson, 2005; Ryan & Warden, 2003; Taber & Hurley, 2013)
  - mTBI = concussion

- Numerous reviews detail pathophysiology and details on mechanisms of injury (IOM, 2008; Iverson, 2005; MacGregor et al., 2011; McCrea et al., 2009)

- Military personnel at higher risk of sustaining compared to civilians, often due to blast exposure (DePauw et al., 2005; MacGregor et al., 2011; Taber et al., 2006; Walker et al., 2009; Warden, 2006)

- Priority Condition in VHA (Taylor et al., 2012; VA, 2010)

TBI (cont’d)

- Symptoms at time of injury
  - History of TBI ≠ Current TBI
  - Important implications for screening results
  - CPG exists for guidance on management

Common Post-Concussion Symptoms

- Cognitive
  - Difficulty concentrating, forgetfulness, difficulty making decisions, slowed thinking

- Affective
  - Fatigue, difficulty sleeping, anxiety/feeling tense, depression, irritability, poor frustration tolerance

- Somatic/Sensory
  - Dizziness, loss of balance, poor coordination, nausea, vision problems, sensitivity to light and/or noise, hearing difficulty, numbness or tingling sensation, change in taste/smell, loss of appetite, headaches

(Howe, 2009; VA, 2007; VA/DoD, 2009)

(Caplan et al., 2010; O communities & Kahlke, 1995; Ouallet & Mann, 2006; Verhees et al., 2000)
Expected Recovery Parameters

- MOST patients with mild TBI recover fully
  - Symptoms TYPICALLY resolve in 7-90 days
  - Only a small percentage (5-10%) report persistent post concussion symptoms (PPCS)
- Moderate - severe injuries are associated with longer recovery periods and a greater potential for lasting cognitive deficits

(Common TBI Co-Morbidities

- Depression 53-80% (Bombardier et al., 2010; Seel et al., 2010)
- Anxiety 29-70% (Brown et al., 2004; Whelan-Goodinson et al., 2009)
- PTSD 13-74% (Brown et al., 1999; Carlson et al., 2011; Tebes & Joyce, 2008)
- Substance Misuse 50-79% (Brown et al., 2011; Tompkins et al., 2006)
- Chronic Pain 32-72% (Brown et al., 2011; Tompkins et al., 2006)
- ANY MH diagnosis 85-89% (Carlson et al., 2018, Taylor et al., 2011, 2012a-b)
- ≥ 2 MH diagnoses 64% (Carlson et al., 2010)
- Risk for Suicide 1.5-4x (Brown et al., 2004)

OEF/OIF with TBI Using VHA

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number TBI+ Veterans Treated in VHA</td>
<td>22,053</td>
<td>27,126</td>
<td>30,521</td>
</tr>
<tr>
<td>Male</td>
<td>95%</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>Service Connected (Any percentage)</td>
<td>73%</td>
<td>74%</td>
<td>70%</td>
</tr>
<tr>
<td>Any MH diagnosis</td>
<td>89%</td>
<td>88%</td>
<td>88%</td>
</tr>
<tr>
<td>PTSD</td>
<td>73%</td>
<td>73%</td>
<td>72%</td>
</tr>
<tr>
<td>Depression</td>
<td>45%</td>
<td>47%</td>
<td>47%</td>
</tr>
<tr>
<td>Any Head/ Neck/ Back Pain</td>
<td>70%</td>
<td>72%</td>
<td>72%</td>
</tr>
<tr>
<td>Headache</td>
<td>47%</td>
<td>50%</td>
<td>49%</td>
</tr>
<tr>
<td>Any MH + Pain</td>
<td>64%</td>
<td>66%</td>
<td>65%</td>
</tr>
<tr>
<td>PTSD + Pain</td>
<td>54%</td>
<td>56%</td>
<td>54%</td>
</tr>
</tbody>
</table>

(Taylor et al., 2012a-b)
PTSD (DSM-IV-TR)

- **Re-experiencing**
  - Recurrent and distressing recollections, dreams, hallucinations, flashbacks; cues prompt psychological distress and/or physiological reactivity

- **Avoidance**
  - Efforts to avoid trauma cues, memory difficulty (specific to trauma), decreased interest, feeling detached, restricted affect, sense of foreshortened future

- **Hyperarousal**
  - Sleep disturbance, irritability/anger, difficulty concentrating, hypervigilance, exaggerated startle response

Chronic Pain

- **Pain in excess of 90 days** (Mersky & Bogduk, 1994)
  - Headache (Afari et al., 2009; Erickson, 2011; Mersky & Bogduk, 2008; Roll et al., 2011; Theiler & Erickson, 2009)

- **Back/neck** (Ofek & Defrin, 2007)

- **Neuropathic** (Ofek & Defrin, 2007)

- **Polytrauma** (Clark et al., 2009; Otis et al., 2011; Walker et al., 2010)

- **Associations**
  - Sleep difficulty, fatigue, irritability, depression (Iverson & McCracken, 1997)

- **Pain & opioid management** (VA, 2009; VA/DoD, 2010)

Polytrauma Clinical Triad (P3)

- **PPCS, PTSD, and chronic pain often co-occur** (Lev et al., 2009)
- **Reported symptoms show substantial overlap**
Challenges in Symptom Management

PTSD-specific
Re-experiencing, Shame, Guilt

Shared Symptoms
Depression, Anxiety, Insomnia, Irritability/Anger, Trouble Concentrating, Fatigue, Hyperarousal, Avoidance

PPCS-specific
Sensitivity to Light, Memory Deficits, Dizziness

(Stein & McAllister, 2009)

Challenges in Symptom Management (cont’d)

- PPCS is a controversial topic (Nicholson, 2000)

- Are lasting cognitive complaints due to:
  - Injury?
  - mTBI (Belanger et al., 2010)
  - Moderate - Severe TBI (Duque & Rufard, 2008)
  - Psychiatric factors?
  - PTSD (Campbell et al., 2009; Gordon et al., 2011; Meares et al., 2009)
  - Iatrogenic effects?
  - Medications (Mooney et al., 2010; Cooper et al., 2010; Iliescu & Ponsford, 2003; Meares et al., 2006)
  - Normal variation?
  - "Abnormal performance on some proportion of neuropsychological tests in a battery is psychometrically normal" (Binder et al., 2009, p. 45)

“PPCS” Symptom Influences

- Depression (Garden & Sullivan, 2010; Lange et al., 2011; Meares et al., 2009; Safe & Quiroz, 2003; Vanderploeg et al., 2007)
- PTSD (Belanger et al., 2010; Meares et al., 2011; Pietrzak et al., 2009)
- Personality (Garden et al., 2010)
- Pain (Cowan et al., 2000; Kilts et al., 2010; Meares et al., 2006; Meares et al., 2011; Nicholson, 2000; Smith-Seemiller et al., 2003; Vanderploeg et al., 2007)
- Medications (Iverson, 2005)
- Baseline Characteristics (Mooney et al., 2010)
- Litigation & Malingering (Hicklin et al., 2002; Mease et al., 2005)
- mTBI & Blast Exposure? (Knox et al., 2005; Iliescu et al., 2010; Vanderploeg et al., 2007)
- Other (Senguer et al., 1999; Iliescu & Lange, 2003; Vanderploeg et al., 2011; Warriner et al., 2003)
“PPCS” Symptom Influences (cont’d)

- Symptom onset may be attributable to physiological changes, but persistence is strongly influenced by psychiatric factors (Havard et al., 2012)

Post-Concussion Symptom Reports

Healthcare Utilization, Pain management, and Prescription Opioid Use in this Population
Predictors of Health Care Utilization

- Combat Exposure (Maguen et al., 2007)
- PTSD (Possemato et al., 2010; Yu et al., 2003)
- Chronic Pain & Depression (Kroen et al., 2009)
- TBI (Calhoun et al., 2002; Hodgkinson et al., 2000; Phillips et al., 2004; Taylor et al., 2011, 2012a-c)

HCU in OEF/OIF with TBI

<table>
<thead>
<tr>
<th>Year</th>
<th>Number TBI+ Veterans Treated in VHA</th>
<th>Primary Care Visits</th>
<th>Mental Health Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>22,053</td>
<td>3.9 (4.1)</td>
<td>11.8 (25.4)</td>
</tr>
<tr>
<td>2010</td>
<td>27,126</td>
<td>3.8 (4.2)</td>
<td>12.1 (25.5)</td>
</tr>
<tr>
<td>2011</td>
<td>30,521</td>
<td>3.8 (4.3)</td>
<td>12.2 (27.6)</td>
</tr>
</tbody>
</table>

“Annual medical costs for veterans with TBI were nearly 4-times greater than those without TBI and costs increased as clinical complexity increased” (Taylor et al., 2012c, p. 345)

Veterans with History of Closed TBI

<table>
<thead>
<tr>
<th></th>
<th>TBI+ (n = 780)</th>
<th>Control (n = 780)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age – Mean (SD)</td>
<td>30.6 (7.8)</td>
<td>30.6 (7.8)</td>
</tr>
<tr>
<td>Male</td>
<td>94%</td>
<td>87%</td>
</tr>
<tr>
<td>PTSD</td>
<td>7.4%</td>
<td>32.4%</td>
</tr>
<tr>
<td>Branch of Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Force</td>
<td>3.3%</td>
<td>11.3%</td>
</tr>
<tr>
<td>Army</td>
<td>77.4%</td>
<td>62.3%</td>
</tr>
<tr>
<td>Marine Corps</td>
<td>16.2%</td>
<td>18.7%</td>
</tr>
<tr>
<td>Navy</td>
<td>3.1%</td>
<td>7.7%</td>
</tr>
<tr>
<td>PC – Mean (SD)</td>
<td>3.11 (.08)</td>
<td>2.16 (.06)</td>
</tr>
<tr>
<td>Outpt MH – Mean (SD)</td>
<td>8.9 (.58)</td>
<td>3.2 (.22)</td>
</tr>
</tbody>
</table>

(King, Wade, & Wray, in press)
Mean Clinic Visits over 1 year by TBI Status

Outpatient Healthcare Utilization in Veterans with History of Closed TBI - Year 1

King, Wade, & Wray, in press

Outpatient Healthcare Utilization in Veterans with History of Closed TBI (cont’d)

Mean Clinic Visits over 1 year by TBI/PTSD Status

King, Wade, & Wray, in press

Veterans with PPCS

<table>
<thead>
<tr>
<th></th>
<th>PPCS (n = 421)</th>
<th>Control (n = 421)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age – Mean (SD)</td>
<td>30.3 (7.6)</td>
<td>30.3 (7.6)</td>
</tr>
<tr>
<td>No PTSD/No Pain</td>
<td>4.5%</td>
<td>33%</td>
</tr>
<tr>
<td>PTSD</td>
<td>87%</td>
<td>42%</td>
</tr>
<tr>
<td>Chronic Pain</td>
<td>76%</td>
<td>52%</td>
</tr>
<tr>
<td>Back</td>
<td>60%</td>
<td>45%</td>
</tr>
<tr>
<td>Headache</td>
<td>50%</td>
<td>21%</td>
</tr>
<tr>
<td>Arthritis</td>
<td>54%</td>
<td>63%</td>
</tr>
<tr>
<td>Neck</td>
<td>18%</td>
<td>11%</td>
</tr>
<tr>
<td>Other</td>
<td>33%</td>
<td>23%</td>
</tr>
<tr>
<td>Follow-up yrs (SD)</td>
<td>1.93 (1.1)</td>
<td>1.83 (1.07)</td>
</tr>
</tbody>
</table>

King, Wade, & Beehler, unpublished
Healthcare Utilization in Veterans with PPCS

2-year period

HCU in PPCS & PTSD

1-year period

Opioid Use in Veterans

- Prevalence (Clark, 2002)
- Non-adherence (Koewy et al., 2011)
- Scheduling & Monitoring (Koewy et al., 2011; Pade et al., 2012; Skirvin et al., 2012)
- PTSD & Other MH (Hawkes et al., 2013; Koewy et al., 2011; Menasco et al., 2010; Seal et al., 2012)
Opioid Use in pts. with TBI history?

- Some background
  - Hospitalized TBI patients s/p MVA (Kleppel et al., 2002)
  - NFL (Cottler et al., 2011)
  - Veterans @ Polytrauma Rehab Centers & Polytrauma Network Sites (Clark et al., 2007; Clark et al., 2009; French et al., 2008; Patil et al., 2011)

Medication Use in VA Polytrauma Pts.

<table>
<thead>
<tr>
<th></th>
<th>Clark et al. (2007)</th>
<th>French et al. (2008)</th>
</tr>
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<tbody>
<tr>
<td>n</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Opioids</td>
<td>58%</td>
<td>82%</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>50%</td>
<td>43%</td>
</tr>
<tr>
<td>Anticonvulsants</td>
<td>20%</td>
<td>68%</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Sedative-hypnotics</td>
<td></td>
<td>42%</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td></td>
<td>40%</td>
</tr>
</tbody>
</table>

Medication Use in P3

<p>| | |</p>
<table>
<thead>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Analgesics</td>
<td>86%</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>62%</td>
</tr>
<tr>
<td>Opioid Analgesics</td>
<td>58%</td>
</tr>
<tr>
<td>Non-opioid analgesics</td>
<td>34%</td>
</tr>
<tr>
<td>Antimigraine Agents</td>
<td>20%</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>76%</td>
</tr>
<tr>
<td>Anticonvulsants *</td>
<td>60%</td>
</tr>
<tr>
<td>Sedative-Hypnotics *</td>
<td>48%</td>
</tr>
<tr>
<td>Alpha-Blockers</td>
<td>32%</td>
</tr>
<tr>
<td>Antipsychotics *</td>
<td>29%</td>
</tr>
<tr>
<td>Beta-Blockers</td>
<td>12%</td>
</tr>
<tr>
<td>Psychostimulants</td>
<td>6%</td>
</tr>
<tr>
<td>Mood Stabilizers</td>
<td>2%</td>
</tr>
</tbody>
</table>

(King, Wade, & Beehler, unpublished)
A Current Study

- Explores
  - Comprehension of TBI
  - Experiences with symptoms
  - Perceptions of care in PC and recovery period
- Interviews & self-reports
  - Substance Abuse
  - Depression, PTSD
  - Sleep
  - Pain management strategies (incl. use of opioid medications)
  - Health-related QOL

Clinical Implications

- Understand demographics and common presenting concerns
  - PTSD and pain often co-occur in Veterans with history of mTBI
- Be aware that perceived cognitive deficits are not necessarily attributable to TBI history
  - Consider other causes and normal variation
- Screen for and assess current symptoms related to TBI, PTSD, and chronic pain, including alcohol/substance use and sleep problems
  - Understand that positive screens ≠ confirmed diagnosis
    (Brenner et al., 2010; Carlson et al., 2011; Donnelly et al., 2011)
Clinical Implications (cont’d)

- Validate patient concerns, provide education and feedback around recovery expectancy
- Active treatment planning, negotiate referrals and discuss reasons why
  - Follow CPGs:
    - Review medications & dosage
    - Optimize medications
    - Consider consultations with polytrauma, MH, and clinical pharmacy specialists
- Appreciate complexity of biopsychosocial factors involved in these comorbid conditions
- Practice interdisciplinary care
  - Maintain dialogue with primary care, specialty care, and affiliated providers

Summary

- TBI is a prevalent, complex, & costly condition in OEF/OIF Veterans
  - Veterans with history of TBI and PPCS are likely to use PC and MH resources as well as other VA services at higher rates than other Veterans
  - Veterans who report long-lasting post-concussion symptoms are also frequently diagnosed with PTSD and report chronic pain concerns
  - Relationship between TBI/PPCS and many common co-morbid conditions can be reciprocal in terms of symptom exacerbation and risk
  - Clinical management in this population can be challenging
- Long-term influences of TBI and co-occurring disorders on HCU and other health outcomes have yet to be explored in OEF/OIF Veterans

Summary (cont’d)

- Little specific guidance exists on symptom management in Veterans with P3, though a recent consensus report suggested that current clinical practice guidelines continue to be followed
  - Few interventions specific to TBI cohort have been developed/ tested
- Medical and MH providers in PC are well-positioned to screen and provide initial support for Veterans with TBI, though specialty assessment is necessary to confirm diagnosis and to manage complex patient needs
THANK YOU!

-AND-

QUESTIONS?

Upcoming Webinars

Transforming Nursing through Evidence: Nurses and Methadone Maintenance Therapy

presented by
Sabrina Merali, RN, MN and Margaret Dykeman, PhD, NP
Registered Nurses’ Association of Ontario
Sabrina Merali – Program Manager, RNAO
Margaret Dykeman – Hon. Research Professor, University of New Brunswick

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