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ORIGINAL ARTICLE

Pain and Post-Traumatic Stress Disorder Symptoms During Inpatient Rehabilitation Among Operation Enduring Freedom/Operation Iraqi Freedom Veterans With Spinal Cord Injury

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Abstract

Objective: To examine the frequency of post-traumatic stress disorder (PTSD) symptoms and pain, and how PTSD symptoms were associated with pain severity ratings and the longitudinal course of pain during inpatient rehabilitation for spinal cord injury (SCI) among veterans of the Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) conflicts.

Design: Longitudinal analysis of data gathered from electronic medical records.

Setting: SCI specialty care centers within the Department of Veterans Affairs.

Participants: Veterans of the OEF/OIF conflicts (N = 87) who received inpatient rehabilitation for SCI and disorders at Department of Veterans Affairs SCI centers between May 2003 and October 2009.

Interventions: Not applicable.

Main Outcome Measure(s): PTSD screening at start of rehabilitation and pain numeric rating scale measurements completed throughout rehabilitation. Cut-scores were used to categorize participants into 1 of 4 groups on the basis of scores at the start of rehabilitation: Pain and PTSD, Pain Alone, PTSD Alone, Neither Condition.

Results: Comorbid pain and PTSD symptoms were more common than either condition alone, and nearly as common as not having either condition. Participants with pain at the start of rehabilitation (Pain and PTSD, Pain-Alone groups) showed declines in pain ratings over the course of rehabilitation. In contrast, participants in the PTSD-Alone group showed increasing pain over the course of rehabilitation.

Conclusions: Pain and PTSD symptoms may be more likely to manifest as comorbidities than as isolated conditions during inpatient rehabilitation. Assessment routines and care plans should be prepared with comorbidities as a foremost concern. It is advisable to screen for pain and PTSD at multiple time points during inpatient rehabilitation to detect new or emerging concerns.

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Elevated risk for post-traumatic stress disorder (PTSD) is to be expected after traumatic spinal cord injury (SCI) for the simple fact that such injuries frequently expose a person to extreme physical injury and threat of death. Research on the prevalence of PTSD after SCI supports this position. Radnitz et al[1] have found that rates of current and lifetime PTSD among persons with SCI are comparable to rates in other traumatized groups, for example,

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12% and 29% for current and lifetime prevalence, respectively. Other investigators have found similar, elevated rates of PTSD both during or shortly after rehabilitation for SCI,[2-4] and even decades after initial injuries heal and rehabilitation is complete.[5,6]

Research has linked PTSD to the experience of pain, particularly among military veterans. For example, Shipherd et al[7] found that among a sample of veterans with PTSD, 66% also had a chronic pain diagnosis. A high rate of comorbid pain and PTSD has been documented in a number of other studies focusing on veterans of Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF). Three studies of veterans of OEF/OIF being treated at polytrauma rehabilitation centers[8-10] found high rates of pain (81%–97%) and PTSD (68%–78%). High comorbidity rates are consistent with parallel, general observations that physical and psychological issues experienced by veterans of OEF/OIF are more likely to occur in clusters than in isolation.[10] Not only does the co-occurrence of PTSD and pain appear to be common but the conditions appear to have additive negative effects on functioning and distress as well.[11-14]

Pain is a serious and common concern after SCI,[15-17] so it is reasonable to hypothesize that persons with SCI are at risk for co-occurring pain and PTSD, and the associated deleterious outcomes that are found in other populations. However, such hypotheses have not been tested; little is known about the extent to which pain and PTSD overlap after SCI, or what pain and PTSD overlap might mean in terms of the severity and temporal course of pain. This study focused on co-occurring PTSD symptoms and pain among OEF/OIF veterans who sustained SCI during active military service. Specific study goals were to examine how PTSD symptoms were associated with acute pain severity ratings and the longitudinal course of pain during inpatient rehabilitation for SCI.

Methods

Study design

This was a retrospective longitudinal analysis of data gathered from electronic medical records of veterans of OEF/OIF with SCI who completed rehabilitation in the Department of Veterans Affairs (VA) Spinal Cord Injury and Disorders (SCI/D) System of Care between March 2003 and October 2009. The VA SCI/D System of Care consists of an integrated network of care based on a hub and spokes model. Comprehensive interdisciplinary specialty and primary care is located at 24 designated SCI centers (hubs). Locally accessible primary care is provided at other VA facilities (spokes) by SCI-trained primary care teams. All study procedures were approved and overseen by the authors' human subjects research institutional review boards.

List of abbreviations:

OEF/OIF	**Operation Enduring Freedom/Operation Iraqi Freedom**
PC-PTSD	**primary care post-traumatic stress disorder screen**
PTSD	**post-traumatic stress disorder**
SCI	**spinal cord injury**
SCI/D	**spinal cord injury and disorders**
VA	**Department of Veterans Affairs**

Participants

Military personnel returning from the OEF/OIF conflicts who were transferred from a military treatment facility to a VA SCI center between May 2003 and October 2009 were identified from electronic records maintained by VA SCI/D services. This search identified 140 veterans from the OEF/OIF conflicts who received inpatient rehabilitation for SCI/D during that time period. Fifty-three patients were excluded because they were missing a baseline pain assessment and/or PTSD screening, for a final sample of 87 patients (62%).

Data collection and measures

Trained chart reviewers examined the electronic patient medical records for demographic characteristics (age at injury, sex, marital status, and ethnicity), information on SCI and other injuries (level of injury, completeness, etiology of injury, and occurrence of traumatic injuries comorbid to SCI), length of inpatient rehabilitation stay (length of stay), and clinical assessments of PTSD symptoms and pain.

PTSD symptoms

The primary care post-traumatic stress disorder screen (PC-PTSD)[18] was used to identify participants with PTSD symptoms during inpatient rehabilitation. The PC-PTSD consists of 4 questions reflecting major features of PTSD such as hyperarousal, avoidance, numbing, and reexperiencing symptoms. Three questions answered affirmatively indicate a positive screen for PTSD. The PC-PTSD has been shown to be a psychometrically sound, sensitive, and specific screen for PTSD.[18] The PC-PTSD screen was administered as part of routine care within 2 days of admission to inpatient rehabilitation.

Pain

As part of routine clinical care, participants were asked by nursing and other medical staff to rate their current pain intensity at multiple time points during inpatient rehabilitation using the 0 to 10 numerical rating scale, with 0 = "no pain" and 10 = "pain as bad as could be." Numerical pain rating scales of this variety have been shown to have good test-retest reliability and adequate validity in terms of associations with other pain measures and treatments.[19] Participants used the numerical rating scale to rate overall pain intensity. Scores of 4 or higher on the numerical rating scale were considered to indicate clinically significant pain.[20]

Analyses

Descriptive statistics were used to characterize the population on key study variables. Cut-scores on baseline pain and PTSD symptoms measures were used to categorize participants into 1 of 4 groups: Pain and PTSD, Pain Alone, PTSD Alone, and Neither Condition. The first pain rating measured on the first day of inpatient rehabilitation (baseline pain) was used to determine this grouping (scores of 4 or higher indicating the presence of significant pain). All pain ratings taken over the course of inpatient rehabilitation were averaged to create an overall pain score. Differences between baseline pain and overall pain score were assessed to describe changes in pain scores over time. Two-way analysis of variance was used to compare the 4 study groups on