

# PTSD Common in Soldiers With Mild Brain Injury

BY MIRIAM E. TUCKER  
Senior Writer

Mild traumatic brain injury occurring among soldiers deployed in Iraq is strongly associated with posttraumatic stress disorder and physical health problems 3-4 months after the soldiers return home, according to survey findings.

Results from a survey of more than 2,000 soldiers who had served in Iraq suggest that the relationship between mild traumatic brain injury and physical health problems is largely mediated by the presence of posttraumatic stress disorder (PTSD) and depression.

"The strong associations between mild traumatic brain injury, PTSD, depression, and physical health symptoms in combat veterans reinforce the need for a multidisciplinary approach centered in primary care," said Dr. Charles W. Hoge of the division of psychiatry and neuroscience at Walter Reed Army Institute of Research in Silver Spring, Md., and his associates.

A total of 2,714 soldiers completed the questionnaire, mailed in 2006 to soldiers from two U.S. Army combat infantry brigades—one active and one reserve—3-4 months after their return from a yearlong deployment in Iraq. The survey elicited information about whether soldiers had been injured, the nature of the injuries, and about the soldiers' physical and mental health (N. Engl. J. Med. 2008;358:453-63).

After exclusion of 149 for missing data and 40 with head injuries that did not involve loss of consciousness or altered mental status, the study group comprised 2,525 soldiers. Of those, 5% (124) reported an injury with loss of consciousness. The majority of these episodes lasted between a few seconds to 2-3 minutes, but four soldiers reported having been unconscious for more than 30 minutes. Another 10% (260) reported an injury with altered mental status in which they did not lose consciousness. This 15% was defined as having mild traumatic brain injury.

Another 17% (435) reported some other injury during deployment with no loss of consciousness or altered mental status, most commonly resulting from a fall or injury during training.

This spectrum of injury is likely to be representative

of all soldiers serving in ground-combat units in Iraq, the investigators said.

Compared with the soldiers who had other injuries, those with mild traumatic brain injury were significantly more likely to report high combat intensity, a blast mechanism of injury, more than one blast exposure, and hospitalization while deployed. They were also significantly younger, more junior in rank, and more often male.

Overall, 44% of the soldiers who reported loss of consciousness met the criteria for PTSD, compared with 28% of those with altered mental status, 16% of those with other injuries, and 9% of those with no injuries. Loss of consciousness and combat intensity were the only two factors that remained significantly associated with PTSD after an analysis that took into account age, military rank, sex, hospitalization status, mechanism of injury, level of combat intensity, single vs. multiple blast exposure, and type of injury (loss of consciousness vs. other injuries).

Those with loss of consciousness were nearly three times as likely to have PTSD (odds ratio 2.98), while the odds ratio for the top vs. the bottom quartile of combat intensity was 11.58. Dr. Hoge and his associates reported, adding that injury with loss of consciousness was also independently associated with major depression (odds ratio 3.67).

Soldiers who had lost consciousness were significantly more likely to report poor general health, more missed work days, and a higher number of medical visits in the past month than were soldiers with other injuries. Those who had lost consciousness also had significantly higher scores on the Patient Health Questionnaire 15-item somatic symptom severity scale (PHQ-15).

However, when PTSD and depression were included in the analysis, the relationship between loss of consciousness and the physical health symptoms listed on the PHQ-15 disappeared (except for headache and heart pounding). Indeed, the high PHQ-15 scores occurred almost exclusively in the soldiers who had PTSD, Dr. Hoge and his associates noted.

These findings are "striking," Richard A. Bryant, Ph.D., noted in an accompanying editorial. "One must use caution when attributing health problems to mild traumatic brain injury, because associated PTSD and depression may be the primary problem. This is an important point because mild traumatic brain injury typically occurs in the context of a traumatic event, and psychological stress will probably be influential in many cases of mild traumatic brain injury."

In clinical settings, "impairment observed in the aftermath of mild traumatic brain injury has been attributed incorrectly to neurologic insult, rather than psychological distress," said Dr. Bryant of the School of Psychology, University of New South Wales, Sydney.

There is debate as to whether postconcussive symptoms—such as problems with memory, balance, light sensitivity, and irritability—are the result of organic or psychological factors, or both. The evidence from this study suggests that psychological factors do play a role and that more effective interventions may involve augmenting educational programs with strategies to reduce PTSD and depression, he said.

However, Dr. Bryant cautioned against informing troops who are currently serving in Iraq or Afghanistan that they have a brain injury that will result in permanent change (N.Engl. J. Med. 2008;358:525-7).

"If troops ... are informed about a postconcussive syndrome and persistent problems emerging from mild traumatic brain injury, a new syndrome could arise from the current conflict in which soldiers attribute a range of common stress reactions to the effects of brain injury. This could be damaging to morale and to the person's future mental health, because it could lead to the expectation of poor recovery.

"In contrast, the normalization of many of these reactions and the recognition that stress-related conditions can be managed with evidence-based strategies may minimize the unnecessary attribution of common stress reactions to pathology and facilitate resilience after mild traumatic brain injury." ■

**Soldiers who had loss of consciousness were nearly three times as likely to have PTSD, and injury with loss of consciousness was linked to major depression**

## Nonclassic PTSD Could Elude Diagnosis in Primary Care

BY JEFF EVANS  
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BALTIMORE — Veterans who screen positive for posttraumatic stress disorder but are not clinically diagnosed with the condition have significantly different presentation from that of clinically diagnosed veterans, Kathryn M. Magruder, Ph.D., reported at the annual meeting of the International Society for Traumatic Stress Studies.

In one of the only two studies that have reported the percentage of veterans correctly diagnosed with PTSD in primary care clinics, Dr. Magruder of the department of psychiatry and behavioral sciences, Medical University of South Carolina, and her colleagues at the Ralph H. Johnson Veterans Affairs Medical Center, both in Charleston, previously found that primary care physicians correctly identified PTSD in 47% of veterans who had the condition (Gen. Hosp. Psychiatry 2005;27:169-79).

The other study, an Israeli national sample of primary care providers, reported a "pretty dismal rate of recognition" of PTSD of only 2% (Psychol. Med. 2001;31:555-60).

Dr. Magruder and her associates wanted to determine why primary care clinicians frequently miss PTSD diagnoses, so they randomly selected 819 primary care patients from four VA medical centers to participate. Of 98 (12%) patients who screened positive for PTSD on the Clinician-Administered PTSD Scale, only 42 (43%) were correctly recognized as having PTSD (defined as an ICD-9 diagnosis of PTSD).

Many researchers have suggested that somatic symptoms, such as pain, might divert the attention of primary care physicians so that they pursue a medical diagnosis rather than a psychiatric one. But previous studies have had conflicting results, with pain symptoms found both to make physicians more apt to miss a psychiatric diagnosis and to increase the likelihood they will make a correct psychiatric diagnosis, Dr. Magruder said.

In this study, veterans aged 65 years and older who tested positive for PTSD on

the Clinician-Administered PTSD Scale were significantly more likely to have their PTSD go unrecognized by a primary care clinician (67%, 12 of 18 patients) than to have it diagnosed (33%, 6 of 18). Veterans without war zone service who screened positive also had significantly higher rates of unrecognized PTSD (75%,

21 of 28) than rates of diagnosed PTSD (25%, 7 of 28).

Patients who had worse functioning on the role-emotional subscale of the Short Form-36 quality of life questionnaire were more likely to be recognized as hav-

ing PTSD. Mental health and pain subscales on the SF-36 did not show significant differences between patients according to their PTSD recognition status.

Patients who had an ICD-9 musculoskeletal pain diagnosis were 3.5 times more likely to be recognized as having PTSD than were those who did not have such a diagnosis, after adjusting for age, race, gender, and war zone service.

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In addition, patients with substance use disorders were nearly 10 times more likely to be recognized as having PTSD than were patients without substance use problems.

"This study argues that we really ought to pay better attention to screening results" and that physicians should receive additional training in nonclassic PTSD presentations, Dr. Magruder said at the meeting, which was also sponsored by Boston University.

In the study, "providers may have picked up on more of the obvious presentations of PTSD," such as poor emotional functioning, persistent reexperiencing, and increased arousal.

One limitation of the study is that the data were collected prior to Operation Enduring Freedom and Operation Iraqi Freedom. The younger group of patients in those conflicts could have "sensitized clinicians to look more closely at presentations in younger patients," Dr. Magruder suggested.

The study also did not take into account provider-level factors and problems in the scheduling or duration of clinical visits. ■