

# A Review of Traumatic Brain Injury in Military Veterans: Current Issues and Understanding



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## Abstract

The occurrence of traumatic brain injuries (TBI) is common, with military veterans being at particular risk, especially those undertaking combat roles. However, there remains some confusion regarding the diagnosis and aetiology of TBI, especially concerning mild cases, or mild traumatic brain injury (mTBI). This brief review highlights some of the main issues regarding mTBI, with a focus on military personnel and veterans. In particular, attention is drawn to issues regarding discrepancies in prevalence and incidence rates between the UK and US, Post concussional Syndrome (PCS) and the potential long-term impact of mTBI. Finally, the review explored the relationship between mTBI and mental health difficulties, with a high incidence rate of depression, anger and PTSD found in veterans who meet criteria for mTBI. Implications of these relationships are discussed.

**Keywords:** Mild traumatic brain injury; Military; Veterans; Mental health; PTSD

## Introduction

It is well established that military personnel are at increased risk of Traumatic Brain Injury (TBI) due to the risks of undertaking combat roles [1]. However, there remains some confusion about the aetiology and long-term consequences of brain injuries, especially Mild Traumatic Brain Injury (mTBI). This article will firstly outline some of the current challenges in the classification of mTBI, as well as controversies regarding prevalence rates between UK and US military personnel. It will then go on to describe some of the specific difficulties facing UK military veterans, in the context of associations between brain injury and mental health difficulties. mTBI is a very common form of brain injury, defined as 'a traumatically induced physiological disruption of brain function' [2]. The relatively high rates of mTBI can at least partly be explained by the range of circumstances from which it can occur, from exposure to explosives in combat, to sports injuries and motor vehicle accidents. Because mTBIs are so common and wide-ranging in cause, they can sometimes be perceived as being non-specific in nature and commonly confused or used interchangeably with concussion [3]. In the past, mTBI has been described as the 'signature injury' of recent conflicts in Iraq and Afghanistan. However, this has not been without debate, with many researchers drawing parallels between the discussion surrounding mTBI, and that of 'shell-shock' from World War One [4,5].

Furthermore, there are significant discrepancies in prevalence rates of mTBI between UK and US military samples.

Studies of UK military personnel deployed in Iraq and Afghanistan reported prevalence rates of 9.5% for those in combat roles [6], and 12-month incidence rates of 3.2% (4.2% for frontline personnel) during deployment to Afghanistan [1]. However, prevalence rates in the US have ranged from 15.2-22.8% [7-9]. There is no clear consensus on why this difference exists. One possibility is that there are differences in time frames for reporting the occurrence of a brain injury, i.e. lifetime prevalence as opposed to prevalence during a particular deployment. Some researchers have described the possibility of recall bias when asking participants to report lifetime prevalence [10].

Linked to mTBI is Post Concussional Syndrome (PCS), which describes the longer-term effects of mTBI, assuming the symptoms of mTBI do not naturally resolve within a short time [11]. The ICD-10 classification of PCS requires a head trauma with loss of consciousness in addition to at least three symptoms in a range of categories, such as headaches, dizziness, irritability and insomnia. However, the DSM-5 no longer recognises PCS as a diagnostic label, pointing instead to a more general classification of Neurocognitive disorder due to TBI [12]. This discrepancy may partly be due to the recent consensus that PCS symptoms are more likely indicative of psychological distress, as opposed to being related to a TBI [13,14]. This demonstrates part of the challenge facing those with on-going effects of a TBI, as well as the difficulties facing professionals trying to determine the best course of diagnosis and intervention.

Despite the confusion and controversy surrounding mTBI and PCS, for some the consequences of such injuries can be serious and long-lasting, with a minority going on to develop serious disability such as Chronic Traumatic Encephalopathy (CTE), which is characterised initially as changes in mood and behaviour such as irritability, aggression, depression and memory loss, and in some cases, develops into a dementia-like disorder [15]. There is a clear link therefore between mTBI and psychological and behavioural changes. This poses another challenge given the large numbers of military veterans who develop mental health difficulties.

Until recently, not much was known about the long-term impact of TBI in military veterans, despite prevalence rates being well established. Evidence from a sample of UK veterans seeking help for mental health difficulties showed that 63% reported exposure to a head injury that met criteria for TBI, and 5% for acquired brain injury [14]. These high rates were explained by the fact that this study asked participants to report overall, i.e. lifetime prevalence, as opposed to prevalence during a specific deployment. Additionally, 71% of these veterans reported experiencing four or more symptoms of PCS. However, there was no significant association between TBI and PCS symptoms, adding further to the suggestion that PCS is not related to TBI and is instead a product of psychological distress.

The same study reported that TBI was strongly associated with meeting case criteria for depression and anger problems. In addition to this, several studies have reported associations between TBI and PTSD [1,6,8]. TBIs sustained during deployment have been found to be significant predictors of developing PTSD [16]. There is also emerging evidence for an association between TBI symptoms and hazardous levels of alcohol misuse in treatment-seeking veterans, based on data profiling the health needs of this population in the UK [17].

The overall picture demonstrates the complexity of the needs of some military veterans, particularly where there has been exposure to head injuries during deployment and the possibility of TBI. Given the potentially serious long-term consequences of TBI it is important to be as clear as possible regarding diagnosis and aetiology of different injuries. Furthermore, the strong association between TBI and mental health indicates the importance of thorough screening and assessment of military veterans who report either such symptoms, in order to ensure the most effective treatments are given.

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