

Postconcussion Syndrome/Disorder or Mild Traumatic Brain Injury: diagnostic issues and treatment



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Introduction

Traumatic brain injury at the milder end of the spectrum is far more common than moderate-severe spectrum. Mild traumatic injury (mTBI) accounts for approximately 80% of traumatic brain injuries.¹ Traumatic brain injuries at the milder end of the spectrum which lead to persisting difficulties have been referred to as postconcussion syndrome/postconcussion disorder.^{2,3} Individuals with persistent difficulties following a traumatic brain injury at the milder end of the spectrum may be assessed and treated by Neurology, Neuropsychology, and Neuropsychiatry. There has been ongoing research looking at outcome following traumatic brain injury at the milder end of the spectrum, the validity of postconcussion syndrome/disorder, and treatment of symptoms following milder traumatic brain injuries. This paper will review some of the research in these important areas within neurorehabilitation.

Diagnostic issues

Postconcussion syndrome/disorder is listed in both the ICD-10 and DSM-IV-TR (ICD, DSM-IV-TR). The diagnostic criteria for postconcussional syndrome in the ICD-10 includes a history of head trauma with loss of consciousness preceding symptom onset by a maximum of four weeks. In addition there needs to be symptoms in three or more of the following symptom categories: Headache, dizziness, malaise, fatigue, noise tolerance; irritability, depression, anxiety, emotional lability; subjective concentration, memory, or intellectual difficulties without neuropsychological evidence of marked impairment; insomnia; reduced alcohol tolerance; preoccupation with above symptoms and fear of brain damage with hypochondriacal concern and adoption of the sick role.²

The DSM-IV-TR criteria for postconcussional disorder requires a history of head trauma that has caused significant cerebral concussion. Secondly there is evidence from neuropsychological testing or quantified cognitive assessment of difficulty in attention (concentrating, shifting focus of attention, performing simultaneous cognitive tasks), or memory (learning or recalling information). Thirdly, three (or more) of the following occurring shortly after the trauma, and lasting at least three

months: becoming fatigued easily; disordered sleep; headache; vertigo or dizziness; irritability or aggression with little or no provocation; anxiety, depression, or affective lability; changes in personality (e.g. social or sexual inappropriateness); apathy or lack of spontaneity. The symptoms must have their onset following head trauma or else represent a substantial worsening of pre-existing symptoms. The disturbance causes significant impairment in social or occupational functioning and represents a significant decline from a previous level of functioning.³

There are clear differences in the two diagnostic systems. Firstly, the ICD refers to a syndrome whereas DSM refers to a disorder. Secondly, the ICD requires that the individual has lost consciousness whereas this is not a criterion in the DSM. The DSM requires evidence from neuropsychological testing or quantified cognitive assessment of difficulty in a cognitive domain/s. This is not included in the ICD-10 classification system.

Over the last ten years there has been research looking at the non-specificity of the symptoms within postconcussional syndrome/disorder. Studies show that post-concussive-like symptoms are generally not related to traumatic brain injury at the milder end of the spectrum, particularly as time goes by, but instead are associated with accompanying acute post-traumatic stress, chronic pain, depression or anxiety disorders.^{4,5} Donnell et al's recent study demonstrates this very clearly. They identified participants from 4462 randomly sampled male US Army veterans who served during the Vietnam era. Only 32% of veterans with a history of mTBI met DSM-IV symptom criteria for PCS as compared to 40% of those diagnosed with post-traumatic stress disorder (PTSD), 50% with generalised anxiety disorder (GAD), 57% with major depressive disorder (MDD), and 91% with somatisation disorder.⁶ The results were consistent with existing literature showing that the PCS symptoms are not unique to concussion.

The trend within neuropsychology outcome research has been to focus on outcome following mTBI rather than postconcussion syndrome/disorder. mTBI is generally defined as one in which the individual is not unconscious for longer than 30 minutes, post-traumatic amnesia does

not extend beyond 24 hours, and the individual's Glasgow Coma Scale score is 13/15 within 30 minutes of the injury.⁷ The outcome research predominantly points to individuals making a full cognitive recovery within days to weeks of the injury.¹ If cognitive difficulties persist the cause is due to other factors such as depression, post-traumatic stress disorder, chronic pain, and psychological factors.^{1,3}

The questions regarding the validity of postconcussional disorder are reflected in the latest version of the DSM, the DSM-5. There is no longer a category for postconcussional disorder in the DSM-5. There is a new disorder known as the "Neurocognitive disorders".⁸ Within the spectrum of neurocognitive disorders there is a new category "Major or Mild Neurocognitive Disorder due to Traumatic Brain Injury". There is no longer reference to postconcussional disorder but rather to different severities of traumatic brain injury which include mild TBI, moderate TBI, and severe TBI. Neurocognitive symptoms associated with mTBI are noted to resolve within days to weeks after the injury with complete resolution by three months (DSM-5). It is not known whether postconcussional syndrome will be revised in the next version of the ICD.

Treatment issues

Treatment is divided into two broad categories: rest, education and reassurance in the days/weeks following the mTBI, and treatment at the stage at which symptoms have become more persistent.

In terms of treatment at the early stages, most guidelines include physical and cognitive rest followed by a graded increase in activities with reduction in activities if symptoms return or are exacerbated.⁹ One of the most effective approaches to management of mTBI is patient education. Ponsford et al showed that by just giving an information booklet at one week post injury led to fewer reported symptoms at three months compared to a control group that did not receive the information booklet.¹⁰ These interventions need not be intensive and are most effective when introduced during the acute or subacute recovery phase after mTBI.¹

Specific treatments for mTBI at the later stages are divided into pharmacotherapy, cognitive rehabilitation, and psychotherapy.¹¹ In terms of pharmacotherapy, this can include medication for headaches, as well as medication for anxiety and depression. In general selective serotonin reuptake inhibitors are preferred first line agents because of their relatively benign side effect profile and lower cost generic availability.¹² Cognitive rehabilitation involves looking at compensatory strategies to manage specific cognitive difficulties such as memory difficulties.¹¹

In terms of psychotherapy there is a growing trend with regards to the use of cognitive behavioural therapy in the treatment of mTBI individuals who have developed persistent symptoms, with some positive results.¹³ Recently there has been a pilot study looking at a mindfulness based stress reduction programme with individuals who have suffered a mTBI with persistent symptoms. Clinically meaningful improvements were noted on measures of quality of life after this intervention.¹⁴ McCrea et al stress the importance of taking a biopsychosocial approach to the management of chronic symptoms after mTBI i.e. taking into account pre-injury factors, on-going physical issues, psychological factors, and the social context of the individual.¹⁵ There is a further important point, and that is clinicians need to consider exaggeration of symptoms or functional elements in cases of persistent symptoms where there is the potential for secondary gain.¹

There is growing interest in identifying oculomotor and vestibular disturbances in individuals with persistent symptoms following mTBI. Ellis et al have recently presented an approach to managing acute concussion and postconcussion disorder by identifying dysfunction within specific neurological subsystems.¹⁶ This includes a physiological based postconcussion disorder (disordered alterations in global cerebral metabolism), vestibulo-ocular postconcussion disorder (persistent postconcussion symptoms caused by dysfunction of the vestibuloocular system) and cervicogenic postconcussion disorder (persistent postconcussion symptoms caused by dysfunction of the cervical spine and somatosensory system). The authors identify a range of treatment options including vestibular therapy, vision therapy, and medication. Large scale studies looking at the efficacy of vision and vestibular therapy are clearly needed.

Conclusions

It is important for clinicians to be aware that there is a move away from diagnosing postconcussion disorder. This is most clearly demonstrated in the DSM-5 which no longer includes the diagnostic category of postconcussion disorder. It will be important for clinicians to review the next version of the ICD to see whether the disorder of postconcussion is amended or taken out altogether as has occurred in the DSM-5.

Clinicians need be cautious when using the term postconcussion syndrome/ disorder as it implies all the present symptoms are attributable to the traumatic brain injury. There is now a more nuanced understanding of symptoms following mTBI and that not all symptoms are attributable to the initial brain injury. It may be more helpful to individuals to be provided with an explanation as to the likely causes of their various symptoms which may include depression/ chronic pain/ vestibular difficulties. This of course would be predicated on a comprehensive assessment in order to determine the cause of the various on-going symptoms.

A consensus has yet to emerge regarding the best treatment for treating mTBI. Part of the difficulty in finding one effective treatment for the symptoms following a mTBI is that there are so many possible causes of on-going difficulties. The range of possible causes for on-going problems include pre-injury factors, current psychiatric diagnoses, vestibular issues, chronic pain, malingering, and various combinations of these factors.^{1,15} When one considers the complexity in mTBI cases it is therefore not surprising that there is not a clear single treatment which has been shown to be effective in treating persisting symptoms. However, in reviewing the literature it is clear that progress is being made in terms of expanding the number of treatment options for individuals with persistent symptoms following mTBI.¹

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