

### How Mild is Mild Traumatic Brain Injury?

*“The short- and long-term consequences of mild traumatic brain injury may be more serious than often recognised”*

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#### COLUMN ARTICLE

Mild traumatic brain injury (mTBI) (/concussion/com-motio cerebri) is the least devastating and most common type of traumatic brain injury (TBI). But although the consequences of mTBI are less severe than those seen after moderate and severe TBI, the term “mild” may be somewhat misleading and serious clinical consequences may be overlooked.

In many mTBI patients the initial cognitive symptoms resolve within a few weeks posttraumatically. But in 15-30% of mTBI cases, symptoms persist beyond this timeframe - potentially even chronically [3]. Relative to the symptomatology in case of more severe forms of TBI the impairments seen in mTBI may clinically appear less striking. And it has even been suggested that the mTBI-associated symptoms are primarily or exclusively of a psychogenic nature rather than a direct consequence of neural injury [2].

The tendency to clinically downplay the consequences of mTBI may also reflect that most neuroimaging techniques are unable to detect mTBI-associated neuropathological changes. Diffuse axonal injuries may be the primary neuropathological consequence of mTBI and in order to adequately detect such changes diffusion tensor imaging may be required [11].

Animal models of mTBI further stress the cognitive as well as neurophysiological and biochemical consequences of this condition. Acute as well as long-lasting (potentially chronic) behavioural/cognitive and electrophysiological impairments have been demonstrated after both repetitive mTBI [1,10] and a single mTBI episode [6,13,14].

A growing body of evidence (from clinical studies and animal models alike) appears to indicate that the long-term consequences of mTBI may not be limited to the mentioned cognitive symptoms. mTBI (and maybe especially repeated episodes of mTBI) may be one of the primary risk factors regarding neurodegenerative conditions – primarily chronic traumatic encephalopathy (CTE) and potentially also Alzheimer’s disease [7,9].

Given these severe consequences - acutely as well as potentially chronically - of mTBI it is important that there is an increased attention to the diagnosis and therapeutic interventions regarding mTBI in clinical practise. Positive therapeutic effects of cognitive and behavioural therapy in cases of mTBI have been demonstrated [12] but additional well-designed clinical studies within this field are urgently needed [5].

Further clinical as well as experimental studies are also needed regarding both the immediate symptoms of mTBI and the association between mTBI and later development of neurodegenerative conditions [4,8].

Finally, the potentially serious consequences of repeated mTBI (and maybe even a single episode of mTBI) indicate that recommendations regarding various contact sports may have to be reconsidered. In many instances (e.g. traffic accidents and military service) possibilities to reduce the occurrence of mTBI may be limited. But in case of contact sports it may be time for a more stern warning on the basis of our present knowledge.

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