

Academic and Emotional Effects of Mild Traumatic Brain Injury on Children

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Common Causes of MTBI

An MTBI is sustained either when a blow from an external source damages the brain, or when the head is shaken in such a way that the anterior and posterior areas of the brain collide against the skull. “Neural tissue is frequently stretched or torn by these movements, and by its impact with the rough, bony ridges inside the skull. Subsequently, the transmission of impulses from one neuron to the next is disrupted” (Lebanon Valley College Office of Disability Services, 2002, para. 2). At the time, the victim may experience any number of symptoms signifying a brief change in mental status: disorientation, nausea, confusion, dizziness, or loss of consciousness. Often, a person who sustains an MTBI is instructed to rest for a few days and then resume normal activity. However, there is a growing body of evidence to support the claim that the aforementioned neural tissue damage “involves a process that is initiated (but not completed) at the moment of injury” (LVCODS, 2002, para. 2) that can continue for several weeks, but rarely longer than six months (Marschark, Richtsmeier, Richardson, Crovitz, & Henry, 2000). Because MTBIs are generally regarded as temporary conditions, many people who sustain them do not seek medical attention. Due to this, it is believed that the prevalence of MTBI may be significantly underestimated (Marschark, et al., 2000).

While most research seems to indicate that any damage sustained as a result of an MTBI is temporary, even short-term effects can be detrimental, both academically and emotionally, to children. Fortunately, there is extensive research to provide short- and long-term solutions to dealing with at least the academic component of MTBI.

Effects of MTBI on Academic Achievement

When one suffers an MTBI, the axonal and neuronal damage sustained can cause significant cognitive deficits to emerge (Singer, W., and Harp, J.A., 1995, as cited in Slater, 1997), perhaps the single most prevalent of which is disorder in speed of information processing. These people are slow to react and to initiate psychomotor activities such as talking, writing, and performing mechanical tasks. This slowness also frequently coincides with short-term memory disorders and organizational difficulties, and usually disrupts new learning (Hildebrand, K.H., and Weintraub, A.H., 1992, as cited in Slater, 1997). These

impairments compound to produce a quicker onset of mental and physical fatigue than the victim experienced before their MTBI, as well as difficulties with selective attention. Selective attention deficits certainly contribute to the high level of distractibility that is the hallmark of an MTBI, as well as making it extremely difficult for some MTBI patients to follow a large-group conversation (Hildebrand & Weintraub, 1992, as cited in Slater, 1997).

In a study of the academic performance of college students who had previously suffered an MTBI, Marschark, et al. (2000) noted that patients with MTBI “may exhibit impaired performance in tests of executive functioning, especially in tasks demanding a high level of strategic control.” (p.1229). The inference is made that students with MTBI may have difficulty in adapting learning styles to suit different academic environments, which may lead to these students feeling that what, under normal circumstances, might be an average course load, actually feels disproportionately heavy (Marschark, et al., 2000). While in the classroom, students with MTBI may have difficulty understanding alternate viewpoints or alternative approaches to problem solving. The lecture scenario that is so common in college and some high school settings presents the MTBI patient with multiple problems: first, taking notes during a lecture may be difficult, if not impossible, due to the student’s impaired ability to multitask. Additionally, simply processing the lecture content will prove extremely difficult, due to the aforementioned slowed information processing rate concomitant with most MTBIs. The effects of the MTBI may also manifest themselves in an inability to recall simple tasks (such as bringing a notebook to class) and, perhaps most devastating to the learning process, an impaired ability to recognize that anything is wrong at all with the student’s behavior or functioning, which frequently results in a denial of problems (LVCODS, 2002).

A recent case study best illustrates some of the problematic academic effects of an MTBI. Allison, a 16-year-old female, received a Grade 3 concussion during a Friday night soccer game as a result of being kicked in the head by another player. Allison had no previous record of head trauma, but upon admission, complained of blurred vision and headaches, and she vomited once. A review of her academic history showed her to be a conscientious B student (“Mild Traumatic,” 2004).

Allison was not hospitalized; CT imaging revealed neither brain damage nor skull fracture. She complained of some memory loss (she could not remember playing in the game or her time in the emergency room), experienced periodic headaches, and slept frequently over the weekend, but by Monday, Allison felt able to return to school. Once she was back into her normal routine, however, she began to complain of mid-morning fatigue, high distractibility in the cafeteria at lunchtime, and difficulty taking notes in history class because her teacher talked “too fast for [her] to take notes” (“Mild Traumatic,” 2004).

After two weeks of difficulties, Allison’s parents took her to a neurologist, who subsequently referred her to a neuropsychologist. Testing revealed “abnormalities in complex attention, speed of information processing, ability to learn new information and complex problem solving...As expected, the evaluation did not show any changes in intellectual ability, academic skills, or expressive or receptive language” (“Mild Traumatic,” 2004, para. 3). This is important to note for two reasons: first, it substantiates the above-cited research on the effects of MTBI. Second, it reinforces the belief that MTBI can not detract from one’s intellectual capacity; it merely affects processing and organization, a vastly different classification.

With regard to her academic problems, Allison was granted a 504 plan that provided her with extended time for reading assignments and assistance taking notes in her lecture classes. Other accommodations that may be of short-term benefit to students include the provision of advance organizers for the day’s notes, textbooks or novels on tape, and being allowed to take breaks during testing. In more extreme cases, students may need to temporarily reduce their course load or rearrange their schedule to avoid back-to-back classes or afternoon classes (LVCODS, 2002). Additionally, Allison worked with the speech language pathologist over the course of several weeks to work on organization, problem solving, and memory compensation skills. These sessions used actual curriculum materials from Allison’s courses. After eight weeks of treatment, Allison still experienced afternoon fatigue, but was better able to deal with distractions and her course load. (“Mild Traumatic,” 2004)

As Allison learned, the effects of MTBI are not permanent. In Marschark, et al.’s (2000) study, they concluded that “students who sustained such injuries during childhood or adolescence achieved normal

scores on the SAT and that they exhibited normal performance on a wide variety of cognitive tasks. Purely from an intellectual standpoint...mild TBI need not have any deleterious consequences for the individual student's subsequent academic performance on programs of study in postsecondary education" (Marschark, et al., 2000, p. 1239).

Effects of MTBI on Emotional Development

Unlike the academic effects of MTBI, the impact that such an event can have on one's emotional well being can be much further reaching than a few weeks. Although the emotional sequelae to MTBI are less well understood than the cognitive (Mathias & Coats, 1999), research literature suggests that the severity of emotional changes (largely negative) that may develop from MTBI is proportionate to the severity of the injury (Mathias & Coats, 1999). Regardless of severity, families of MTBI victims frequently report that personality changes are more serious and more distressing to the family unit than cognitive and behavioral changes (Brooks, et al., 1983; Malia, Powell, & Torode, 1995b, as cited in Mathias & Coats, 1999). Many believe these emotional changes to be rooted in neurobiology, for example, people who sustain frontal/temporal and multifocal injuries often develop disorders of perception and judgment. This can lead to misinterpreting or misreading the actions or intentions of other people, and also to the patient being socially inappropriate in verbal communication conversation (Hildebrand & Weintraub, 1992, as cited in Slater, 1997). Other changes observed in MTBI patients with damage to the frontal lobe and limbic system include indifference, inflexibility, mania, impulsiveness, emotional lability, apathy, disinterest, and lack of spontaneity (Absher & Cummins, 1995; Malia, et al., 1995b; Mattson & Levin, 1990; Stuss & Benson, 1984, 1986; Stuss, et al., 1992, as cited in Mathias & Coats, 1999).

Despite these seemingly depressing findings, it is important to remember that researchers have had significant difficulty in measuring the specific emotional changes because emotions are so unique to each individual. Stuss & Benson (1986, as cited in Mathias and Coats, 1999) posit that post-MTBI injury changes in personality seem to be influenced by the individual's premorbid personality characteristics. This revelation further muddies the investigative waters surrounding this issue. What researchers do know is that these changes can be treatable, at least to an extent.

Allison, the 16-year-old soccer player, experienced some emotional changes in addition to her academic difficulties. She reported becoming increasingly frustrated with her struggles at school, and felt that she had lost control over her life. Allison's parents noted that she had become moody and short-tempered with her family and friends. In Allison's case, her personality changes seemed to be rooted in her academic difficulties. Once those were remediated, her parents reported a reduction in her moodiness, and Allison reported feeling more positive and in control of her life ("Mild Traumatic," 2004). It is worth noting, however, Allison's premorbid personality: a conscientious, straight-B student type who participated in extracurricular activities. Conclusive research has yet to be done on how that variable might have affected her recovery, and one might ask if her recovery process would have had similar results if Allison was previously a disengaged loner with a poor academic record.

While many students like Allison are often able to resume their normal lives within a period of three to six months, the emotional scars of MTBI can linger, even after academic difficulties have been remediated. Marschark, et al., (2000) can attest to the far-reaching emotional effects of MTBI. In their survey of college students who had previously experienced MTBI, a significant portion of subjects (all of whom sustained MTBI during either their childhood or adolescence) reported to be "manifesting a substantial level of emotional distress, despite the fact that an average period of 6 years had elapsed since their injury" (p. 1240).

The exact nature of emotional changes following MTBI is still unclear to researchers. Due to the widely varied methods of studying these changes, their source (social, organic, psychological, or any combination thereof) has yet to be determined (Mathias & Coats, 1999), and seems unlikely to be defined in the near future, unless several researchers can coordinate studies with the same measures and controls. Furthermore, measures that can "reliably and validly assess personality change and are suitable for use with brain-damaged populations" (Satz, et al., 1996, as cited in Mathias & Coats, 1999, p. 202) have yet to be developed, according to Mathias & Coats, and are absolutely necessary to make significant progress in gauging both the severity and the range of post-MTBI emotional changes.

References

- Lebanon Valley College Office of Disability Services. (2002). *Mild Traumatic Brain Injury (MTBI) and Post-Concussion Syndrome*. Retrieved July 11, 2004, from <http://www.lvc.edu/disability-services/bulletins/mtbi.pdf>
- Marschark, M., Richtsmeier, L.M., Richardson, J.T.E., Crovitz, H.F., & Henry, J. (2000). Intellectual and emotional functioning in college students following mild traumatic brain injury in childhood and adolescence. *Journal of Head Trauma Rehabilitation*, 15(6), 1227-1245. Retrieved July 11, 2004 from PsycInfo database.
- Mathias, J.L., Coats, J.L. (1999). Emotional and cognitive sequelae to mild traumatic brain injury. *Journal of Clinical & Experimental Neuropsychology*, 21(2), 200-215. Retrieved July 11, 2004, from PsycInfo database.
- Mild traumatic brain injury case illustration. (2004). *Pediatric Brain Injury – Case Illustration*. Retrieved July 11, 2004, from <http://www.meritcare.com/specialties/rehab/brain/abi/mtbi/caseIllusAllison.asp>
- Slater, M.J. (1997, September). Traumatic Brain Injury: The overlooked diagnosis in traumatic spinal cord injury cases. *The Verdict*. Retrieved July 11, 2004, from http://www.slatervechio.com/articles/Verdict_Sept_97.htm