INTRODUCTION

The goal of this chapter is to present the topic of Mild Traumatic Brain Injury (MTBI) within a transdisciplinary, biopsychosocial context. After defining MTBI, citing its incidence in the United States and reviewing diagnostic criteria, we will focus on the question: What are the outcome predictors for individuals who have incurred a MTBI? In other words, are there risk factors for certain sets of symptoms associated with how an individual will respond to a MTBI, or “early markers” for predicting the likelihood of developing a persistent postconcussional disorder?

To date, there have been few studies that have examined outcome predictors for MTBI. The impetus for having these determinants is two-fold: to serve current patients most effectively and to analyze trends that would enable us to create public policies that will serve this population. Ultimately, the goal is also to institute preventative measures that would reduce the size of the population that currently requires service. Given the current status, we first explored how clinicians’ prognostications might help identify a clinical model for predicting outcome. Second, we examined the complexities involved in designing research paradigms whose goal is to develop a model for prediction.

DEFINITION

Traumatic Brain Injury (TBI) refers to a physiological disruption of brain functioning caused by an external force resulting in an acceleration/deceleration or a direct blow to the head. TBI does not include hereditary, congenital or degenerative processes,
stroke, post surgical complications or disease processes, (e.g., tumors, aneurysms, encephalitis, anoxia). TBI should also not be confused with whiplash, where damage is to extra-cranial structures and not directly related to cerebral injury. However, whiplash may occur concurrently with brain trauma. Whiplash is a forceful cervical flexion-extension, with or without a torsional (twisting) component. It results in pathological lesions to peripheral nerves, muscles and vascular structures in the head and neck, but not to the central nervous system (Snyder and Nussbaum, 1998), as would be the case with diffuse axonal injury. TBI is classified by its level of severity into “severe,” “moderate” or “mild.” After reviewing incidence and prevalence of TBI in general, we will focus on MTBI.

INCIDENCE AND PREVALENCE

Statistics on the etiology of TBI from the Center for Disease Control (2002) indicate that transportation-related injuries are the leading cause of TBI (44%). The breakdown within this category is as follows: 62% are occupants in enclosed motor vehicles, 13% are pedestrians, 7% involved bicycles, 6% involved motorcycles and 12% are classified as “other.” Falls account for 26% of TBI, most of which involve children less than five years old and adults older than 75. Firearm and non-firearm assaults account for 8% and 9% of the injuries, respectively.

The 1999 CDC Report to Congress on TBI in the United States reported the following statistics (Center for Disease Control, 2001):

- Every 21 seconds, one person in the United States sustains TBI.
- More than 1.5 million people will sustain TBI annually (incidence rate of 100 per 100,000)
- 50,000–52,000 people die of TBI annually.
- TBI is more than twice as likely in males than as in females.
- 91% of firearm-related TBI results in death.
- There are currently 5.3 million Americans living with a disability as a result of TBI.

These statistics estimate that the incidence of TBI has not only reached epidemic proportions, but that compared to 1992 data, the number of individuals has increased from 1.3 million in 1992 to 1.5 million in 1999. In the preceding decades, the mortality rate was considerably higher, approximately 200,000, 50% of whom died within the first 2 hours post-trauma. The introduction of seatbelts and other safety precautions (which reduced mortality by 57%) combined with better emergency medical care at the trauma scene appear to be the primary factors for this great decline. However, more people surviving TBI has also meant an increase in the amount of treatment and aftercare required. 1995 data estimated the lifetime costs for direct and indirect services for TBI in the United States at $56.3 billion (Thurman, 2001).

The 1998 NIH Consensus Statement on rehabilitation of persons with traumatic brain injury concluded that “since TBI may result in lifelong impairment of an individual’s physical, cognitive, and psychosocial functioning and prevalence is estimated to be 2.5 million to 6.5 million individuals, TBI is a disorder of major public health significance” (National Institute of Health, 1998). The Brian Injury