

Early Diagnosis and Treatment of Traumatic Vestibulopathy and Postconcussive Dizziness



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KEYWORDS

- Mild traumatic brain injury (mTBI) • Neurosensory sequelae • Dizziness
- Vestibular rehabilitation

KEY POINTS

- Neurosensory disorders are the most common sequelae of mild traumatic brain injury (mTBI), and among these, balance disorders are the ones most frequently seen.
- Balance disorders seen after mTBI can be diagnosed and treated, and whereas some resolve with time, many of these disorders require treatment.
- Vestibular rehabilitation is one of the most important treatment modalities available for patients with mTBI and has been documented to be successful in this patient group.
- Untreated mTBI can produce long-term degenerative neurosensory disorders.

INTRODUCTION

mTBI is an increasingly common public health concern that has garnered increased attention in both the lay press and medical literature. Neurosensory effects are among the most common sequelae of mTBI, with balance-related findings being the most

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common.¹⁻⁶ Balance disorders present a unique opportunity with respect to mTBI because they are almost universally present, they can be documented easily with qualitative and quantitative tests, and prompt treatment can result in marked improvement and return to function. On the other hand, untreated acute balance disorders after mTBI represent a significant and underappreciated public health issue. Chronic balance issues from mTBI can affect quality of life for many years after the injury and, in some cases, balance function can deteriorate unpredictably over time. The vestibular system itself has been shown to be damaged in mTBI as evidenced by documented benign paroxysmal positional vertigo caused by blast or blunt trauma mechanisms,⁷ semicircular canal dehiscence,⁸ and peripheral vestibular hypofunction.⁸ This article begins with a review of the prevalence of mTBI in general, and then discusses clinical evidence indicating balance disorders after mTBI and examines the most recent trends in diagnosis. Finally, it discusses the recent basic scientific hypotheses regarding the cause of mTBI-induced neurosensory disorders and provides a brief overview of vestibular rehabilitation for mTBI.

THE DEFINITION OF MILD TRAUMATIC BRAIN INJURY

There are a variety of definitions of mTBI. Although these definitions were developed by health organizations and government agencies, there is no consensus definition. For a detailed discussion of this particular topic, the reader is referred to the Centers for Disease Control and Prevention (CDC) Web site,⁵ which is an excellent resource for traumatic brain injury (TBI)- and mTBI-related health issues. For this article, the authors have adopted a basic functional definition of TBI as follows:

1. A traumatic event affecting the head (such as blunt trauma, explosion, or large acceleration-deceleration)
2. An event that resulted in alteration or loss of consciousness
3. An event with resultant neurologic symptoms and signs

Among individuals with such events, mTBI is defined by the following inclusion criteria:

1. Glasgow Coma Score greater than 13
2. Loss of consciousness for less than 1 hour
3. No surgical intervention needed (including a burr hole for drainage of bleeding)

Stated simply, mTBI (as the authors address it in this article) is a concussion. Although penetrating injuries can cause TBI, they are rarely mild and are generally associated with other types of disorders, so penetrating TBI is not addressed in this article.

EPIDEMIOLOGY

It is difficult to draw reliable conclusions from the existing epidemiologic data regarding prevalence and long-term consequences of mTBI. The lack of consensus in definitions and the fact that many mTBI cases go unreported makes epidemiologic classification problematic. It is clear that the reported prevalence of mTBI is increasing. Several reports focused on selected populations, such as high-school athletes⁹ or emergency departments (EDs), over limited time frames^{10,11} do give estimates of the relative prevalence of mTBI in different populations. A recent study by Marin and colleagues¹² used the Nationwide Emergency Department Sample to investigate trends of visits to ED for TBI between 2006 and 2010. The data culled from a sample of 950 hospitals showed a sharp increase in the weighted rates of

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