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Review

Pharmacotherapy in rehabilitation of post-acute traumatic brain injury

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ABSTRACT

There are nearly 1.8 million annual emergency room visits and over 289,000 annual hospitalizations related to traumatic brain injury (TBI). The goal of this review article is to highlight pharmacotherapies that we often use in the clinic that have been shown to benefit various sequelae of TBI. We have decided to focus on sequelae that we commonly encounter in our practice in the post-acute phase after a TBI. These symptoms are hyper-arousal, agitation, hypo-arousal, inattention, slow processing speed, memory impairment, sleep disturbance, depression, headaches, spasticity, and paroxysmal sympathetic hyper-activity. In this review article, the current literature for the pharmacological management of these symptoms are mentioned, including medications that have not had success and some ongoing trials. It is clear that the pharmacological management specific to those with TBI is often based on small studies and that often treatment is based on assumptions of how similar conditions are managed when not relating to TBI. As the body of the literature expands and targeted treatments start to emerge for TBI, the function of pharmacological management will need to be further defined.

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Abbreviations: TBI, traumatic brain injury; CDC, Centers for Disease Control and Prevention; ED, emergency department; AHRQ, US Agency for Healthcare Research and Quality; NMDA, N-methyl-D-aspartate; DRS, disability rating scale; CSM, cerebral state monitoring; PTSD, post-traumatic stress disorder; GABA, gamma aminobutyric acid; CCI, controlled cortical impact; TCA, tricyclic antidepressant; MAS, Modified Ashworth Score; SCI, spinal cord injury; MS, multiple sclerosis; BoNT, Botulinum toxin; ITB, intrathecal baclofen

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1. Introduction

Traumatic brain injury (TBI) visits to the hospital have increased in the last decade according to the Centers for Disease Control and Prevention (CDC). In an effort to obtain a more stable sample of incidence, a recent study evaluated inpatient and emergency department (ED) data sets from 2006–2010 from both the US Agency for Healthcare Research and Quality (AHRQ) and CDC (Taylor and Xu, 2015). The study found there were nearly 1.8 million visits annually to the ED and over 289,000 patients were hospitalized annually for injuries related to a TBI. While the majority of these patients recover from their injuries, a significant number have ongoing symptoms related to their TBI. The goal of this article is to review the medication treatment options that we often use in the clinic and will highlight the data surrounding their efficacy. We have decided to focus on sequelae that we commonly encounter in our practice in the post-acute phase after a TBI. These impairments are hyper-arousal, agitation, hypo-arousal, inattention, slow processing speed, memory impairment, sleep disturbance, depression, headaches, spasticity, and paroxysmal sympathetic hyperactivity. It should be noted that

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