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Methylphenidate accelerates functional recovery following traumatic brain injury: A case report

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Introduction: Traumatic Brain Injury (TBI) is a major cause of death and disability among youth in the United States. There is increasing interest in identifying patients with TBI who have potential to emerge from coma [1]. There is growing data on efficacy of neurostimulants in TBI patients with chronic cognitive deficits; however the data on their use in the acute setting is limited. Here, we describe a case where methylphenidate was used in a patient with coma after grade III Diffuse Axonal Injury (DAI) in an acute setting with promising results [2].

Case report: A 42-year-old male with premorbid Modified Rankin Scale of 0 presented as a Level 1 trauma for bicyclist versus motor vehicle collision. His initial Glasgow Coma Scale (GCS) was 3 with agonal breathing. He was intubated [3]. He was found to have multiple skull fractures, cerebral contusions, multifocal traumatic subarachnoid hemorrhages, subdural hematoma, multiple lower extremity fractures and retro-orbital hematoma requiring Intra Cranial Pressure (ICP) monitor and ophthalmological intervention [4]. An MRI of the brain showed evidence of bilateral traumatic micro bleeds in the dorsal pontomesencephalic junction. Therefore the injury was classified as grade III DAI, which historically signifies poor prognosis. His hospitalization was marred with complications of ICP crises, Acute Respiratory Distress Syndrome (ARDS), ileus and paroxysmal sympathetic hyperactivity among others. His GCS mostly varied from 3 to 4 [5]. He was started on methylphenidate, a neurostimulant drug that inhibits the reuptake of dopamine and norepinephrine in presynaptic neurons. This drug was later titrated up. Over the course of several weeks, his Coma Recovery Scale-Revised (CSR-R) improved from 0 to 15 [6]. At that point, due to a possible side effect of consistent tachycardia, methylphenidate was held and his CRS-R rapidly declined to 4. As his tachycardia did not improve, methylphenidate was resumed, and his follow-up CSR-R went up to 19. About three months from the onset of injury, he finally emerged from a disorder of consciousness and wrote his name on a piece of paper from a disorder of consciousness and wrote his name on a piece of paper [7].

Discussion: Determining prognosis in young patients with TBI is notoriously difficult. The recovery may be lengthy and many patients who survive have significant disabilities. The chance of recovery of consciousness and meaningful interaction with the environment is an important element that helps families makes tough decisions about their loved ones [8]. Our case shows that neuro stimulants may offer recovery potential to patients with severe TBI and coma. Although this is an experience from one case, the concomitant decline and improvement in CSR-R in conjunction with respective discontinuation and resumption of methylphenidate, is a promising sign.

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Conclusion: Use of neuro stimulants, with guidance of experienced neuro rehabilitation physicians in an acute setting, may aid patients with severe TBI and coma regain consciousness. Continued clinical studies based on a large sample size are necessary to determine efficacy of these agents.

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Biography

Remi Okwechime is currently working as an Assistant Professor of Neurology, Neurosurgery and Medicine at University of Rochester, USA.

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