

## Overview of Traumatic Brain Injury Drugs

Veena Priyadarshini S\*

School of Life Sciences, Crescent Institute of Science and Technology, Chennai, Tamil Nadu, India

### EDITORIAL

Traumatic Brain Injury drugs (TBI) drugs are used to treat traumatic brain injuries, prevent further brain injury, and control the side effects of a traumatic brain injury. Several types of drugs are used for immediate treatment after a traumatic brain injury, as well as long-term care of any physiological, psychological, or neurological disorders that may arise because of the TBI. After a brain injury, the first goals of treatment are to stabilize the patient's vital parameters and avoid further harm.

The following medications are used to treat injuries in the acute phase:

- I. Diuretics are used to remove excess CSF and lower brain pressure (intracranial pressure)
- II. Magnesium helps the brain's blood flow and maintains homeostasis.
- III. Gabapentin and other anticonvulsants are used to prevent seizures caused by hyperactive neurons that have been stimulated by the damage.

In severe brain injuries, sedatives like barbiturates are used to lower intracranial pressure or produce a medical coma. Antidepressants, muscle relaxants, pain relievers, and stimulants may be needed to treat deficiencies in cognitive skills like attention, memory, learning, and language for long-term care of TBI-related diseases.

Osmotic diuretics are one of the acute care drugs for brain injury. Osmotic diuretics reduce the amount of water in the brain, which is then drained and expelled in the urine. During acute care, osmotic diuretics are given for a short time to relieve edoema and intracranial pressure. Mannitol is an osmotic diuretic that is used to treat TBI (Osmitol, Resectisol)

Seizures are treated with anticonvulsant medicines. TBI can cause an overabundance of brain chemicals (neurotransmitters) to be released, overstimulating neurons, and causing seizures and brain damage. Phenytoin (Dilantin, Phenytek), Valproate sodium, Carbamazepine Topiramate (Topamax) (Equetro), Gabapentin, these are the anticonvulsants used to treat TBI (Neurontin). Low electrolyte levels caused by traumatic brain injury can have a negative impact on heart function and blood pressure. Magnesium

enhances blood flow to the brain and inhibits glutamate, an excitatory neurotransmitter that causes overstimulation of neurons. Following a TBI, electrolytes includes, Sulfate of Magnesium (NMDA), Potassium/Phosphate.

N-methyl-D-aspartate (NMDA) receptor antagonists diminish neuron hyperactivity and protect the brain from secondary harm. Both glutamate and aspartate, an excitatory neurotransmitter released after an injury, stimulate the NMDA receptors, causing aberrant neuronal activity. NMDA receptor antagonists stop NMDA receptors from working. Dextromethorphan/quinidine is a popular NMDA receptor antagonist administered after a TBI (Nuedexta). If alternative techniques of lowering intracranial pressure are ineffective, barbiturates, which have sedative and anticonvulsant characteristics, may be used. In patients with serious brain injury, barbiturates may be used to produce a medical coma. The following barbiturates are used to treat TBI Pentobarbital sodium is a medication that is used to treat a variety of (Nembutal sodium).

Calcium channel blockers help sustain blood flow to the brain by preventing blood vessel spasms. Calcium channel blockers have proven to be effective in reducing subsequent damage following subarachnoid haemorrhages. Nimodipine is a popular calcium channel blocker used to treat TBI (Nymalize). Stimulants work by boosting the levels of neurotransmitters like norepinephrine and dopamine in the brain, which improves various elements of cognition including alertness and attention. Methylphenidate hydrochloride (Ritalin, Daytrana) and Modafinil are two stimulants used in TBI treatment (Provigil). Traumatic Brain Injury (TBI) is a nondegenerative, noncongenital lesion to the brain caused by an external mechanical force, which can result in permanent or temporary impairment of cognitive, physical, and psychosocial functions, as well as a lowered or changed level of consciousness.

Motor dysfunction is not usually evident after a traumatic brain injury. Traumatic brain injury can also cause other hidden symptoms relating to cognition and behavior. The "silent pandemic" moniker comes from the reality that people living with traumatic brain injury are mainly unseen and do not speak up about their needs, as well as widespread misunderstanding of the impact of linked conditions. The impact of traumatic brain injury on

**Correspondence to:** Veena Priyadarshini S, School of Life Sciences, Crescent Institute of Science and Technology, Chennai, Tamil Nadu, India, Tel: +9500084421, E-mail: veenapriya31@gmail.com

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individuals and society can be influenced by a variety of healthcare service-related issues. Implementing algorithm-based best practices in emergency and intensive care medicine, a systematic approach to neurorehabilitation, greater access to relevant services, and enough

funding are among them. People with traumatic brain injuries may be hindered from taking advantage of the most critical time for rehabilitative treatment if these concerns are not addressed, resulting in significantly higher care expenses.