Valproic Acid and Midazolam Infusion for Post-Traumatic Seizures in Patients with Severe Traumatic Brain Injury

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Introduction

Post-traumatic seizures have been documented to occur frequently after traumatic brain injury, with a significant proportion demonstrated to be non-convulsive. To summarize the incidence of post-traumatic seizures and proportions of convulsive and non-convulsive seizures. To determine efficiency of valproic acid and midazolam as first line anticonvulsants in the prophylactic and rapid control of seizure attacks.

Methods

A retrospective investigation was conducted from 2011 to 2016 on patients with severe traumatic brain injury. Continuous electroencephalograph (cEEG) monitoring was applied for seizure determination and treatment evaluation. Valproic acid (VPA) and midazolam (MDZ) infusion were used in prophylactic treatment and rapid control of seizures, respectively. Mortality, length of ICU/Hospital stay, Glasgow outcome scales were compared among the groups.

Learning Objectives

Continuous electroencephalograph is essential to detect post-traumatic seizures in severe TBI patients. Non-convulsive seizures showed significant impact on patient outcomes. Valproic acid and midazolam infusion could successfully control approximately 40% of seizure attacks, while nearly 10% would turn into refractory seizures.

Results

After analysing 455 cases of severe TBI, we have detected 92 (20.22%) cases with post-traumatic seizures. The majority of first post-traumatic seizures were detected within 3 days after injury, which could be related to low VPA plasma concentrations. MDZ infusion could rapidly end epileptic activity in 39.13% of seizure patients, though 10.87% turned into refractory seizures. Non-convulsive seizures accounted for 44.57% of all post-traumatic seizures and 9.01% of all patients with severe TBI. Compared to convulsive ones, Non-convulsive seizures had greater impact on outcomes.

Conclusions

Post-traumatic seizures is a major complication for severe TBI. cEEG monitoring is recommended to identify non-convulsive seizures that had great impacts on outcomes. With VPA infusion as prophylactic anti-seizure therapies, MDZ is effective as first line anti-seizure medications.

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