itself. NCSE in patients with epilepsy and NCSE associated with an episode of clinical seizure have a better outcomes.

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Therapy of non-convulsive status epilepticus in severe brain injury

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Background: The study is intended to analyze the effectiveness of levetiracetam, valproic acid and carbamazepine in the treatment of non-convulsive status epilepticus in patients with severe brain injury.

Methods: The results of 30 patients' treatment (26 men, 4 women) aged from 20 to 65 years with severe traumatic brain injury who were examined and treated at the St. Petersburg Research Institute of Emergency Care named after I.I. Dzhanelidze are considered. The level of patients' consciousness was assessed on a Glasgow Come Scale. EEG registration was performed on the "Mitsar-EEG-202" complex in the standard derivations of "10-20%" system. Bandwidth: 1.6 - 35 Hz. EEG monitoring was performed in order to diagnose non-convulsive status epilepticus, in the dynamics with administration of anticonvulsant therapy and clear consciousness. The first group included 12 patients who received carbamazepine at a daily dose of 1200 mg. In the second group of 7 patients, carbamazepine was replaced by levetiracetam with an initial dosage of 2500 mg per day. 11 patients from the third group received valproic acid at a dosage of 1500 mg per day. The significance of differences was assessed using Fisher's exact test.

Results: The level of consciousness of all patients was from coma 1 to coma 2 (from 5 to 8 points GCS, respectively). Among the patients of the first group, carbamazepine was administered immediately after the clinical and electrophysiological verification of the non-convulsive status epilepticus in the initial dosage of 800 mg per day with a gradual increase in the daily dose to 1200 mg. The level of consciousness was restored to clear in 2 of 12 patients (16.7%) for 12-16 days. The apallic syndrome in the outcome was observed in 4 patients. Fatalities occurred in 6 of 12 cases.

In the second group, where carbamazepine therapy was replaced with levetiracetam at a dose of 2500 mg per day, consciousness was restored to a clear in 6 of 7 patients (85.7%) for 6-10 days. One observation was fatal.

In the third group, when confirming the diagnosis of non-convulsive status epilepticus, patients were prescribed valproic acid at a dosage of 1000-1500 mg per day. Of the 11 patients in this group, in 5 (45.5%), the level of consciousness recovered to a clear in 10-14 days. In three patients, an apallic syndrome was observed in the outcome. Death occurred in three cases.

Thus, the probability of a favorable outcome, consisting in recovery of clear consciousness, was significantly higher (85.7% versus 16.7% and 85.7% versus 45.5%, $p < 0.05$) when levetiracetam was used as anticonvulsant therapy. The duration of unconscious state in patients during the use of this drug was significantly reduced.

Conclusions: Registration of the continued epileptiform activity of a high index on EEG with severe brain injury necessitates the appointment of adequate anticonvulsant therapy in time.

The use of levetiracetam is more effective than the prescription of carbamazepine and valproic acid preparations.

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Dosing of anti-epileptic therapy in refractory status epilepticus

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Background: Status epilepticus (SE) is a life-threatening condition that if untreated, can lead to significant morbidity and mortality. Goals of SE care begin with patient stabilization followed by first line benzodiazepines. Intravenous anti-epileptic agents can subsequently be used for treatment and in refractory situations, anesthetic agents are necessary. Evidence based guidelines detail appropriate dosing for anti-epileptic treatments in SE. Our aim is to determine whether dosing guidelines are followed in regards to initial anti-epileptic therapy in refractory SE.

Methods: A retrospective chart review was conducted searching for patients aged 18-99 years admitted to Mayo Clinic Arizona over the last 10 years (2008-2018). Refractory SE patients on anesthetic agents during their admission were included in this study. Records were reviewed for initial benzodiazepine and loading doses of anti-epileptic medications at the time of SE identification. Medications reviewed included lorazepam, midazolam, fosphenytoin, levetiracetam, and valproate sodium.

Results: Seventy-six patients were identified with a mean age of 63.1 (27-89). The majority, 50% (38/76), presented in non-convulsive status epilepticus (NCSE). The remaining seizure types included: convulsive SE 25% (19/76), generalized tonic-clonic seizure followed by NCSE 21% (16/76), and myoclonic seizures 3.9% (3/76). Twenty-five patients had a history of seizure. Forty-seven patients had documented dosing of lorazepam as first therapy with an average dose of 0.05 mg/kg. Average dosing for remaining anti-epileptics included: .09 mg/kg midazolam, 17.8 PE/kg fosphenytoin, 22.5 mg/kg levetiracetam, and 17.5 mg/kg valproate sodium.

Conclusions: SE is life-threatening and requires appropriate dosing of anti-epileptic agents to ensure seizure cessation. Overall, our findings suggest that in general, anti-epileptic agents are underdosed in refractory status epilepticus. Guidelines suggest the following dosing regimens: 0.1 mg/kg lorazepam, 0.2 mg/kg midazolam, 20mg PE/kg fosphenytoin, 60mg/kg levetiracetam, and 40mg/kg valproate sodium. This study provides room for quality improvement in treating patients with SE. Future studies can be done to assess clinical outcomes from better dosing of anti-epileptic therapies.

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High-Dose Diazepam Controls Dyskinesia in Anti-NMDA receptor Encephalitis

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