Posttraumatic epileptic seizure prophylaxis

- Blocking the innate immune CD1d/NKT cell axis prevents the development of cortical hyperexcitability and posttraumatic epilepsy
- Perioperative clinical and radiological predictors of late post-traumatic seizures in surgically treated patients with depressed skull fractures: A prospective observational study
- P2X7R antagonism suppresses long-lasting brain hyperexcitability following traumatic brain injury in mice
- Comparison of Effectiveness of Brivaracetam and Levetiracetam for Prophylaxis of Early Post-Traumatic Seizures: A Prospective Comparative Interventional Study
- Antiseizure medication practices in the adult traumatic brain injury patient population
- Development of Seizures Following Traumatic Brain Injury: A Retrospective Study
- A comparison of the antiepileptogenic efficacy of two rationally chosen multitargeted drug combinations in a rat model of posttraumatic epilepsy
- Effectiveness of Fosphenytoin and Levetiracetam to Prevent Posttraumatic Seizures in Young Children with Accidental or Abusive Traumatic Brain Injury

Posttraumatic epileptic seizure prophylaxis, also known as posttraumatic epilepsy prevention, involves the use of medications or interventions to reduce the risk of epileptic seizures following a traumatic brain injury (TBI). Traumatic brain injuries, which can result from events such as head trauma, concussions, or penetrating injuries, are known to increase the risk of developing epilepsy or recurrent seizures. Prophylactic measures are taken to minimize this risk. Here are some key points to understand about posttraumatic epileptic seizure prophylaxis:

Risk Assessment: Not all individuals who experience a traumatic brain injury will develop posttraumatic epilepsy. The risk of developing epilepsy after a TBI depends on several factors, including the severity of the injury, the location of the injury in the brain, and individual factors like age and genetics. Healthcare providers typically assess the individual's risk based on these factors.

Initiation of Prophylaxis: Prophylactic treatment is not always initiated immediately after a TBI. It is generally considered for individuals who have a high risk of developing posttraumatic epilepsy. Decisions about when and whether to start prophylaxis are made on a case-by-case basis.

Antiepileptic Drugs (AEDs): The primary approach to posttraumatic epileptic seizure prophylaxis involves the use of antiepileptic drugs (AEDs). These medications are prescribed to help prevent seizures. Commonly used AEDs for this purpose include phenytoin, levetiracetam, and valproic acid.

Duration of Treatment: The duration of prophylactic treatment varies based on the individual's risk factors and response to treatment. Some individuals may receive AEDs for a relatively short period, such as a few weeks to a few months, while others may require longer-term treatment.

Monitoring: Individuals receiving prophylactic AEDs are closely monitored by healthcare providers to assess the effectiveness of the treatment, monitor for side effects, and adjust the medication dosage if needed. Regular follow-up appointments are crucial.

Discontinuation: In some cases, AEDs may be tapered and discontinued if there is no evidence of seizures during the prophylactic treatment period. Decisions regarding discontinuation are made carefully, as discontinuing AEDs too soon may increase the risk of seizures.

Other Interventions: In addition to medication, other interventions may be considered, such as neurosurgery in cases of severe TBI with focal lesions or implantation of devices like vagus nerve

stimulators (VNS) in refractory cases.

Seizure Education and Safety: Individuals who have experienced a traumatic brain injury and are at risk for seizures should receive education about recognizing the signs of seizures and taking safety precautions to minimize injury during a seizure.

Individualized Approach: The decision to initiate prophylactic treatment and the choice of AED are highly individualized. Healthcare providers consider the specific circumstances and medical history of each patient.

It's important to note that not all individuals who experience a traumatic brain injury will develop epilepsy, and the decision to use prophylactic treatment is carefully weighed against the potential risks and benefits. Healthcare providers assess the patient's risk and make treatment recommendations accordingly. Additionally, ongoing research is conducted to better understand the mechanisms of posttraumatic epilepsy and to improve prophylactic strategies.

Levetiracetam or phenytoin is often used for seizure prophylaxis in this patient population, but valproic acid may be an appropriate therapeutic alternative in patients with concomitant agitation ¹⁾.

There was no difference between lacosamide and phenytoin in the prevention of early posttraumatic epilepsy in patients following TBI. Lacosamide may have a more tolerable side effect profile²⁾.

The control of early post-traumatic seizure is mandatory because these acute insults may add secondary damage to the already damaged brain with poor outcome. Prophylactic use of antiepileptic drugs have been found to be have variable efficacy against early post-traumatic seizures.

Based on current studies, however, anticonvulsants have been shown to reduce early PTE occurring within the first 7 days, but little to no benefits have been shown in late PTS occurring after 7 days $^{3)}$.

The lack of evidence on which antiepileptic drug to use in PTE is surprising given the number of patients prescribed an antiepileptic drug therapy for TBI. On the basis of currently available Level III evidence, patients treated with either levetiracetam or phenytoin have similar incidences of early seizures after TBI⁴⁾.

There is no statistically significant difference in the efficacy of Phenytoin and Levetiracetam in prophylaxis of early posttraumatic seizures in cases of moderate to severe traumatic brain injury ⁵⁾.

Systematic review

During June and July 2015, a systematic literature search was performed that identified 6097 articles. Of these, 7 met inclusion criteria. A random-effects meta-analysis was performed. A total of 1186 patients were included. The rate of seizure was 35 of 654 (5.4%) in the levetiracetam cohort and 18 of 532 (3.4%) in the phenytoin cohort. The meta-analysis revealed no change in the rate of early PTS with levetiracetam compared with phenytoin (relative risk, 1.02; 95% confidence interval, 0.53-1.95; P

2025/06/30 02:19

= .96).

The lack of evidence on which antiepileptic drug to use in PTS is surprising given the number of patients prescribed an antiepileptic drug therapy for TBI. On the basis of currently available Level III evidence, patients treated with either levetiracetam or phenytoin have similar incidences of early seizures after TBI⁶⁾.

Levetiracetam for posttraumatic epileptic seizure prophylaxis

Levetiracetam for posttraumatic epileptic seizure prophylaxis

1)

Nicole Gilliam D, Sarangarm P, Elwood K. A Retrospective Case Series on Valproic Acid for Early Post-Traumatic Seizure Prophylaxis After Traumatic Brain Injury in Patients With Concomitant Agitation. Hosp Pharm. 2023 Oct;58(5):496-503. doi: 10.1177/00185787231160435. Epub 2023 Mar 22. PMID: 37711412; PMCID: PMC10498971.

Kwon SJ, Barletta JF, Hall ST, Mangram AJ, Dzandu JK, Abdulhamid M, Zach V. Lacosamide versus phenytoin for the prevention of early post traumatic seizures. J Crit Care. 2018 Nov 14;50:50-53. doi: 10.1016/j.jcrc.2018.11.010. [Epub ahead of print] PubMed PMID: 30471561.

Kirmani BF, Robinson DM, Fonkem E, Graf K, Huang JH. Role of Anticonvulsants in the Management of Posttraumatic Epilepsy. Front Neurol. 2016 Mar 22;7:32. eCollection 2016. Review. PubMed PMID: 27047441.

Khan NR, VanLandingham MA, Fierst TM, Hymel C, Hoes K, Evans LT, Mayer R, Barker F, Klimo P Jr. Should Levetiracetam or Phenytoin Be Used for Posttraumatic Seizure Prophylaxis? A Systematic Review of the Literature and Meta-analysis. Neurosurgery. 2016 Sep 30. PubMed PMID: 27749510.

Khan SA, Bhatti SN, Khan AA, Khan Afridi EA, Muhammad G, Gul N, Zadran KK, Alam S, Aurangzeb A. Comparison Of Efficacy Of Phenytoin And Levetiracetam For Prevention Of Early Post Traumatic Seizures. J Ayub Med Coll Abbottabad. 2016 Jul-Sep;28(3):455-460. PubMed PMID: 28712212.

Khan NR, VanLandingham MA, Fierst TM, Hymel C, Hoes K, Evans LT, Mayer R, Barker F, Klimo P Jr. Should Levetiracetam or Phenytoin Be Used for Posttraumatic Seizure Prophylaxis? A Systematic Review of the Literature and Meta-analysis. Neurosurgery. 2016 Dec;79(6):775-782. PubMed PMID: 27749510.

From: https://neurosurgerywiki.com/wiki/ - Neurosurgery Wiki
Permanent link: https://neurosurgerywiki.com/wiki/doku.php?id=posttraumatic_epileptic_seizure_prophylaxis
Last update: 2024/06/07 02:57