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Levetiracetam for Seizure Prophylaxis in Spontaneous Intracerebral Hemorrhage

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Introduction

- Seizures are a common complication following a spontaneous intracerebral hemorrhage (sICH).¹
- Approximately 10-19% of patients will experience an early seizure, occurring within the first 7 days post sICH.¹⁻⁴
- Levetiracetam is often utilized for early seizure prophylaxis, despite limited evidence to support improvements in functional outcomes, long term seizure control, and mortality with its use.^{1,10,11}
- The appropriate dose, duration, and efficacy of levetiracetam for early seizure prophylaxis is unknown.

Purpose

Characterize the use of levetiracetam for early seizure prophylaxis in patients with sICH

Methods

- Retrospective chart review
- Adult patients admitted to a Level 1 trauma, Comprehensive Stroke, academic medical center from January 1, 2016 to December 31, 2021 who received levetiracetam following sICH
- Sample size: convenience sample
- Primary endpoint
 - Duration of levetiracetam
- Secondary endpoints
 - Levetiracetam dose
 - Concurrent antiepileptic agents administered
 - Number of patients receiving levetiracetam for more than 7 days
 - Number of patients receiving levetiracetam at hospital discharge
- Data collection: demographics, hospital stay and discharge details, levetiracetam administration details, and concomitant antiepileptic agent use
- Data analyzed with descriptive statistics
 - Mean and standard deviation (SD) used to report parametric data
 - Median and interquartile range (IQR) used to report nonparametric data

Results

N = 96 Patients

Table 1.

Baseline Characteristics	
Age, mean (SD)	63.1 (14.2)
Male, n(%)	59 (61.5%)
Weight (kg), mean (SD)	82.7 (19.7)
CrCl (mL/min), mean (SD)	73.6 (36.2)
NIHSS* at presentation, mean (SD)	10.4 (9.9)
ICH score at presentation, mean (SD)	1.3 (1.1)
ICH volume > 30 mL, n(%)	43 (44.7%)
Cortical involvement, n(%)	57 (59.4%)

*National Institute of Health Stroke Scale

Table 2.

Hospital Course	
Length of hospital stay (days), median (IQR)	10.9 (4.9 - 19.3)
Discharge disposition	
Home, n(%)	31 (32.3%)
Inpatient rehab, n(%)	22 (22.9%)
In hospital mortality, n(%)	19 (19.7%)
Long term acute care, n(%)	5 (5.2%)
Hospice, n(%)	4 (4.2%)
Extended care facility, n(%)	8 (8.3%)
Other, n(%)	7 (7.3%)

Table 3.

Discharge	n (%)
Levetiracetam prescribed at hospital discharge (total patients)	52 (54.2%)
Home	21 (40.4%)
Inpatient rehab	19 (36.5%)
Extended care facility	5 (9.6%)
Long term acute care	3 (5.8%)
Other	4 (7.7%)

Table 4.

Duration of Levetiracetam	
Duration of levetiracetam in hospital (days), median (IQR)	6.8 (2.8 - 13.9)
Levetiracetam used for > 7 days, n(%)	48 (50.0%)

Table 5.

Dosing	n (%)
Initial regimen*	
1000 mg q12h	6 (6.3%)
500 mg q12h	85 (88.5%)
500 mg q24h	1 (1.0%)
Appropriate dose at initiation (renal)*^	84 (87.5%)

*Four patients only received a one-time dose of levetiracetam 1000 mg

^One patient did not have a calculated CrCl due to no height or weight being recorded during their admission

Table 6.

Concurrent Antiepileptic Agent Administration	n (%)
Patients who received concurrent administration of any antiepileptic administration of any antiepileptic agent	55 (57.3%)
Brivaracetam	1 (1.0%)
Diazepam	2 (2.1%)
Gabapentin	5 (5.2%)
Lacosamide	3 (3.1%)
Lorazepam	33 (34.4%)
Midazolam	29 (30.2%)
Phenytoin	4 (4.2%)
Pregabalin	1 (1.0%)

Discussion

- The median duration of levetiracetam for seizure prophylaxis following sICH was approximately 7 days.
- The most frequently prescribed initial levetiracetam regimen for seizure prophylaxis following sICH was 500 mg every 12 hours.
- The observed dose and duration of levetiracetam for seizure prophylaxis following sICH is similar to previously reported results in literature.⁶
- The observed median duration of 7 days aligns with the time frame of early seizure presentation, although the efficacy of this therapy is not clearly supported in literature.
- More than half of patients received concurrent administration of another antiepileptic agent.
 - Lorazepam and midazolam were the most frequently prescribed agents, which may be due to their utilization for agitation and sedation.
- Study limitations: all risk factors for seizures following sICH were not collected, indication for concurrent antiepileptic agents were not collected, convenience sample utilized

Conclusion

Levetiracetam was prescribed for a median duration of 6.8 days, most commonly at a dose of 500 mg every 12 hours

Future Directions

Future analysis planned to evaluate the efficacy of levetiracetam for early seizure prophylaxis by determining the incidence of clinical and subclinical seizures following sICH.

Disclosures

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

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