Persistent Inpatient Use of Gabapentin for Pediatric Migraine Despite Limited Benefit: A Six Year Retrospective Analysis

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Introduction & Objectives

Migraine is one of the most common neurologic causes of hospitalization in children and adolescents. Gabapentin, an anticonvulsant with neuromodulatory properties, is sometimes used off-label for migraine management, despite limited evidence supporting its effectiveness.

- Systematic reviews have shown no significant benefit of gabapentin over placebo for migraine prophylaxis
- The role in acute inpatient care remains unclear.
- Recent studies suggest that off-label medications, including gabapentin, are often prescribed more frequently than FDA-approved therapies.

To evaluate inpatient prescribing patterns of gabapentin for pediatric migraine
Assess associations with:

- Pain score change
- Readmission rates
- Length of stay (LOS)

Hypothesis: Gabapentin use is not associated with improved outcomes in inpatient treatment of pediatric migraine

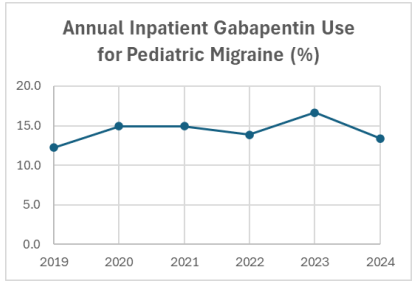
Methods

- Patients admitted with a primary diagnosis of migraine at a tertiary children's hospital between 2019-2024 identified.
- Patient demographics, including age and comorbidities, were extracted from the EMR.
- Medication administration records were reviewed to identify gabapentin exposure during hospitalization.
- Pain scores and vital signs were collected at admission and discharge to evaluate clinical response.
- Hospital length of stay and readmission data were gathered for each patient to assess outcomes.
- All data were de-identified and the study was approved by the institutional review board.

Statistical analyses

- Utilized trend evaluation using the Cochran–Armitage test to examine gabapentin prescribing over time.
- Group comparisons for categorical variables were performed with chi-square tests, while continuous variables were compared using t-tests.
- Statistical significance was defined as $p < 0.05$.

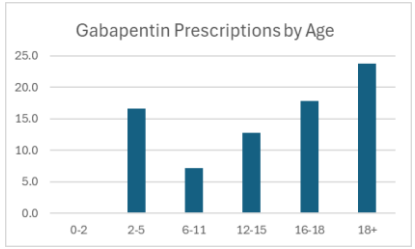
Prescribing Trend



Graph 1: Demonstrating annual gabapentin prescribing for pediatric patients admitted with migraine

Year	n Patients	n Prescribed	Percent
2019	327	40	12.2
2020	315	47	14.9
2021	375	56	14.9
2022	383	53	13.8
2023	330	55	16.7
2024	299	40	13.4

Table 1: Demonstrating annual gabapentin prescribing for pediatric patients admitted with migraine



Graph 2: Demonstrating age groups prescribed gabapentin following migraine admission

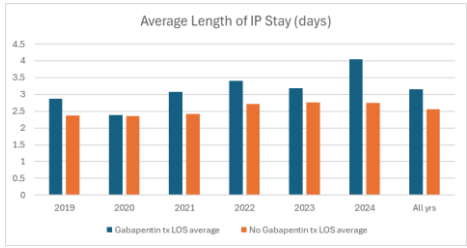
By age	n Patients	n Prescribed	Percent
0-2	1	0	0.0
2-5	30	5	16.7
6-11	379	27	7.1
12-15	770	98	12.7
16-18	685	122	17.8
18+	164	39	23.8

Table 2: Demonstrating age groups prescribed gabapentin following migraine admission

Comparative Results

	Gabapentin tx LOS average	No Gabapentin tx LOS average
2019	2.9	2.4
2020	2.4	2.4
2021	3.1	2.4
2022	3.4	2.7
2023	3.2	2.8
2024	4.1	2.7
All years	3.2	2.6

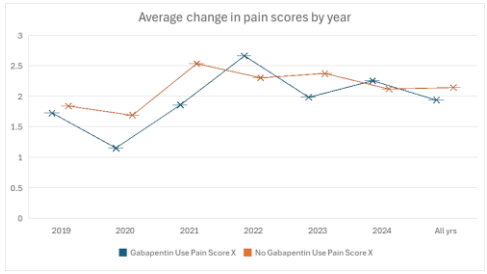
Table 3: Demonstrating LOS average (days) for gabapentin vs non-gabapentin treatment groups



Graph 3: Demonstrating LOS average (days) for gabapentin vs non-gabapentin treatment groups

	Gabapentin Use Pain Score X	No Gabapentin Use Pain Score X
2019	1.73	1.84
2020	1.15	1.69
2021	1.86	2.54
2022	2.66	2.30
2023	1.98	2.37
2024	2.26	2.12
All years	1.94	2.14

Table 4: Demonstrating changes in pain scores for gabapentin vs non-gabapentin treatment groups



Graph 4: Demonstrating changes in pain scores for gabapentin vs non-gabapentin treatment groups

Results Contin.

Gabapentin Group Readmit Percentile			
>=7 days	8->=30 day	>30 day	Anytime
4.5	7.6	33.0	45.0

No Gabapentin Group Readmit Percentile			
>=7 days	8->=30 day	>30 day	
3.2	7.0	23.8	34.0

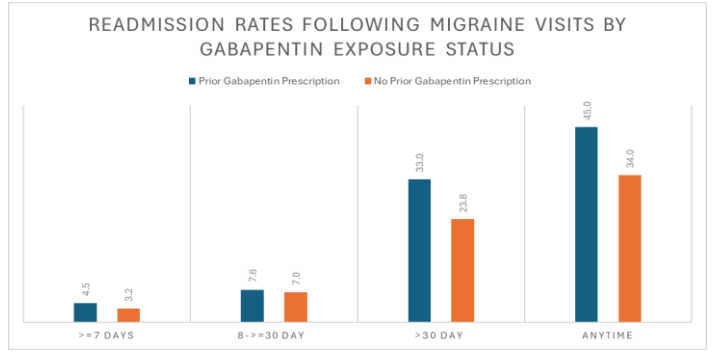


Table 5: Demonstrating readmission rates for pediatric patients admitted with migraine based on gabapentin vs non-gabapentin treatment groups
Graph 5: Demonstrating readmission rates for pediatric patients admitted with migraine based on gabapentin vs non-gabapentin treatment groups

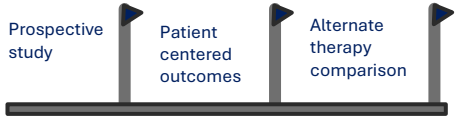
Discussion

Over the study period, a total of 2,029 admissions were included. Of these, 291 patients (14.3%) received gabapentin, while 1,738 patients (85.7%) did not. Gabapentin prescribing remained stable over time, ranging from 12.2% in 2019 to 13.4% in 2024 ($p = 0.43$).

- Patients receiving gabapentin experienced a longer median hospital LOS compared to those not receiving the drug (3.2 vs 2.6 days, $p < 0.001$).
- Pain score changes were similar between groups, with no statistically significant difference observed (1.94 vs 2.14, $p = 0.76$).
- Readmission rates were consistently higher among patients who received gabapentin across all measured intervals: 7-day (4.5% vs 3.2%), 8–30 day (7.6% vs 7.0%), and >30-day (33.0% vs 23.8%), with an overall readmission rate of 45% vs 34% ($p = 0.00034$).

These findings suggest that gabapentin continues to be prescribed in roughly one in seven pediatric migraine hospitalizations despite limited supporting evidence. Its use was associated with longer hospital stays and higher readmission rates, without improvement in pain outcomes. This highlights a persistent gap between current evidence and clinical practice and underscores the importance of targeted prescribing stewardship.

Future Direction



References/ Author Contacts