BACKGROUND

Epilepsy, the 4th most common neurological disorder, affects about 2.2 million people in the United States and accounts for $8.6 billion/year in direct medical costs.

A variety of AEDs and other therapies are available to treat epilepsy. However, adherence to antiepileptic drugs (AEDs) is imperfect; lack of adherence which has been linked to increased healthcare utilization and cost.

It has been hypothesized that patients who are not adherent to therapy may experience breakthrough seizures. It is important to assess whether AEDs with long duration of action might mitigate the impact of poor adherence on healthcare costs.

METHODS

This was a cross-sectional retrospective cohort study using data from a commercial HPMA-compliant administrative claims database.

Study population included adults (218 years old), diagnosed with epilepsy, and treated with LA or SA AED therapy during calendar year 2011 (study period).

AEDs were grouped into those with increased half-life or 5 longer duration of action (extended and controlled release) and short-acting AEDs:

- LA AEDs: divalproex sodium (Dilantin®), carbamazepine ER (CBZ ER), topiramate (Topamax®), lamotrigine (Lamictal®), zonisamide (Son沿®), and levetiracetam ER (Keppra®).
- SA AEDs: valproic acid (Depakote®), gabapentin ER (Neurontin®), lamotrigine ER (Lamictal®), carbamazepine EP (Tegretol®), phenobarbital (Luminal®), phenytoin ER (Dilantin®), and omedeprozazapine (Rexall®).

Inclusion Criteria:

- 22 medical claims (230 days apart) with epilepsy diagnosis (ICD-9-CM 345.8 or 780.25) in a one year diagnosis field, with 1 claim occurring in the study period and 1 in the prior year.

- 22 pharmacy claims or AED® in the study period, and
- ≥ 18 years at the end of the study period.

Exclusion Criteria:

- >1 type of AED filled in the study period;
- not continuously enrolled during the study period and for 3 months prior;
- 49 months treatment duration or a treatment gap ≥60 days.

Results:

Study Cohort: The study sample was stratified into two cohorts:

- LA users – PHT, ER, CBZ, EP, Tegretol ER, DVP DR, EP DR, BPL, LEV ER, or ZNS.
- SA users – LEV, LTG, CBZ, or OMC.

- leave all claims in study period were used to determine study use.
- Outcomes: overall costs and utilization, epilepsy-related costs (claims with an epilepsy diagnosis or epilepsy-related tests) and utilization (AED fills and services with an epilepsy diagnosis).
- Other adherence: Medication Possession Ratio (MPR) defined as total days of therapy available in the study period divided by 365.

- Demographic, usual care physician specialty (specialists most seen at the most visits), number of chronic conditions, Charlson comorbidity index (CCI), and epilepsy-specific comorbidities.

- Standardized Analysis: SAS version 9.3 was used for all analyses.
- Dichotomous test or t-test were used for descriptive comparisons and regression and logistic regression models were used to adjust for cohort differences. All tests were 2-sided with significance level of 0.05.

- Objective: To compare the healthcare costs and utilization between patients treated with long-acting (LA) and short-acting (SA) AED monotherapy.

OBJECTIVE

RESULTS

Table: Annual Overall and Epilepsy-Related Healthcare Utilization

<table>
<thead>
<tr>
<th>LA Users</th>
<th>SA Users</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=4,058</td>
<td>n=4,122</td>
<td></td>
</tr>
</tbody>
</table>

Inpatient hospitalizations, n (%) 0.003

- 0: 3,704 (91.3) 3,676 (89.2) 0.686
- 1: 295 (7.3) 357 (8.7) 0.012
- 2+: 59 (1.5) 89 (2.2) 0.012

ED visits, n (%) 0.009

- 0: 3,735 (92.0) 3,724 (90.3) 0.460
- 1: 156 (3.8) 184 (4.5) 0.009
- 2+: 35 (0.9) 64 (1.6) 0.009

Office visits, mean (SD) 0.005

- 0: 3.8 (0.4) 5.9 (2.0) <0.001

Annual Overall and Epilepsy-Related Healthcare Costs

<table>
<thead>
<tr>
<th>Health Care Costs</th>
<th>LA Users</th>
<th>SA Users</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean overall healthcare costs, $</td>
<td>686</td>
<td>460</td>
<td>0.137</td>
</tr>
<tr>
<td>Mean epilepsy-related healthcare costs, $</td>
<td>-954</td>
<td>319</td>
<td>0.003</td>
</tr>
<tr>
<td>Mean pharmacy-related costs, $</td>
<td>1,346</td>
<td>756</td>
<td>0.003</td>
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Adjusted Estimates for LA Users vs. SA Users

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>P Value</th>
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LIMITATIONS

- Although MPR was similar in LA and SA groups, patients treated with LA AED monotherapy incurred a lower economic burden than those treated with SA AED monotherapy.
- Adherence may also be impacted by convenience as LA AEDs have fewer doses per day relative to the SA AEDs.
- Use of AEDs with extended duration of action may decrease healthcare use and lower costs.
- Future studies should assess the impact of duration of action on outcomes in combination therapy and in adolescents, and also examine reasons for the observed cohort differences in the current study.

CONCLUSIONS

REFERENCES
