The Patient Journey Prior to Neuronmodulation in Drug-resistant Epilepsy: Patterns of Utilization and Cost of Healthcare Services and Pharmacotherapy Based on a Claims Database in the United States

Reginald Lassagne, MSc1; Lu Zhang, PhD2; Vanessa Danielson, MSc3; Sandi Lam, MD, MBA4; Ariel Berger, MPH5; Kathyn Evans, MS, MPH5; Tom Vincent, MPA, MPH5; Nicole Stamas, MSc5

1 LiunaNova, Lasanne, VD, Switzerland; 2 Ann and Robert H Lurie Children Hospital of Chicago, Chicago, IL, USA; 3 Liunaova, Nottingham, UK; 4 Evidera | PPD, Waltham, Massachusetts, USA; 5 Evidera | PPD, Bethesda, Maryland, USA

Key Results

Figure 1. Sample Selection Process

Figure 2. Demographic and Clinical Information

Figure 3. Use of ASMs and Other Selected PrescriptionPharmacotherapies

Figure 4. Proportions of Patients with ≥1 Physician or Neurologist Visit, by Month Prior to Implantation

Figure 5. All-case and Epilepsy-related Healthcare Costs in Two-Year Period Prior to Implantation

Background

- Between 30% and 40% of adults with epilepsy are unable to attain adequate seizure control through anti-seizure medications (ASMs)1
- Individuals who fail to achieve sustained seizure freedom following treatment at least two ASMs are considered to have drug-resistant epilepsy (DRE)2
- The breadth of adequate seizure control with pharmacotherapy differs among individuals with accessible ASM regimens in that almost half to two-thirds of patients fail to respond to the latter regimen

Methods

- Merative® Commercial and Medicare Supplemental Databases was used
- It is an administrative healthcare claims database with information on >215 million persons from large employer-sponsored and private (i.e., commercial) insurance plans including Medicare supplemental plans across the US
- Includes claims for medical (i.e., inpatient, outpatient) care and prescription pharmacotherapy, and enrollment data
- All-cause and epilepsy-related healthcare costs: claims data do not allow for a definitive attribution of specific treatment(s) to specific disease(s). Our use of relevant claims data to identify potential DRE was based on relevant definitions

Results

- A total of 880 patients were identified who underwent neurostimulator implantation between January 1, 2012 and December 31, 2019 and who met all selection criteria (Table 1)
- Represented 3.5% of all patients with evidence of neurostimulator implantation and 17.7% of those with a diagnosis code of epilepsy index date
- Mean (standard deviation [SD]) age of study subjects at index date was 26.4 (16.2) years

Study Limitations

- The database lacked detailed clinical data: accordingly, seizure frequency and severity were unavailable
- Claims data do not allow for the allocation of specific treatment(s) (medications or procedures) to specific disease(s). Our use of relevant definitions and medications to define epilepsy-related care was likely of high sensitivity but unknown specificity

Conclusions:

- The two-year period before neurostimulation is characterized by relatively high levels of utilization and cost of medical care and prescription pharmacotherapy, most of which is epilepsy-related
- Relative to average annual healthcare costs among those with commercial insurance, patients in our cohort experienced at least two-fold higher levels of use of health services and almost two-fold higher mean annual healthcare costs
- While large, cohort is a convenience sample limited to commercially insured US patients with DRE who underwent neurostimulation

References: