Neurostimulant Prescription Rates in Patients with Neurological Injuries

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INTRODUCTION

- Neurostimulant medications are an option in the treatment of patients with neurological injuries.
- Neurostimulants can be beneficial in disorders of consciousness, fatigue, attention, and other indications as it help to improve neurological functioning and overall patient outcomes.
- The frequency of neurostimulant prescriptions is unknown.
- This study aimed to determine utilization patterns for neurostimulant medications in patients with neurological injury.

METHODS

- We obtained de-identified patient claims data from Virginia All-Payer Claims Database (APCD) which includes Medicaid and Medicare data.
- We identified patients ≥ 14 yo for inclusion based on ICD 9/10 codes for traumatic brain injury (TBI), ischemic stroke (IS), intracranial hemorrhage (ICH), and subarachnoid hemorrhage (SAH) and had documentation of a neurostimulant prescription between 2015-2021.
- We included data for patients receiving neurostimulants within 90 days of the hospital claim index date.
- Descriptive statistics were used for data analysis.

RESULTS

- The APCD included 1,362,168 patients, that resulted in the inclusion of 2787 patients from the Virginia/Washington DC region that received 6576 neurostimulant prescriptions during the study period.
- Zolpidem can cause paradoxical awakenings which is why it was included in this study; although it may have been used as a sleep aid in some patients.

Demographics	N = 2787
Female, n (%)	1503 (53.93)
Mean Age (SD)	62 (±28)
Race, n (%)	
White	1179 (42.30)
African American	318 (11.41)
Asian	62 (2.22)
American Indian or Alaska Native	4 (0.14)
Native Hawaiian or Pacific Islander	2 (0.07)
Other	1110 (39.83)
Unknown	112 (4.02)
Injury Type, n (%)	
Ischemic stroke (IS)	1218 (43.70)
Traumatic brain injury (TBI)	1048 (37.60)
SAH + ICH	276 (9.90)
SAH + TBI + ICH	73 (2.62)
Hemorrhagic stroke (ICH)	48 (1.72)
SAH + ICH + IS	46 (1.65)
Subarachnoid hemorrhage (SAH)	36 (1.29)
IS + SAH	25 (0.90)
SAH + TBI	17 (0.61)
Hospital Length of Stay, n (%)	
Less than 7 days	1739 (62.40)
More than 7 days	1048 (37.60)

Neurostimulant prescription frequency was ***HIGHER*** *in patients with* ***ischemic stroke*** *and* ***traumatic brain injury*** *compared to other neurological injuries.*

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Results	(n= 6576)
Frequency of Neurostimulant Prescriptions, n (%)	
Zolpidem	1738 (26.43)
Carbidopa/Levodopa	883 (13.43)
Amantadine	666 (10.13)
Ropinirole	663 (10.08)
Methylphenidate	598 (9.09)
Amphetamine	508 (7.73)
Modafinil	335 (5.09)
Rivastigmine	298 (4.53)
Pramipexole	242 (3.68)
Guanfacine	164 (2.49)
Lisdexamfetamine	150 (2.28)
Atomoxetine	124 (1.89)
Bromocriptine	97 (1.48)
Galantamine	90 (1.37)
Armodafinil	15 (0.23)
Donepezil	5 (0.08)
Frequency of Neurostimulant Prescription per Year, n (%)	
2015	1133 (17.23)
2016	563 (8.56)
2017	828 (12.59)
2018	1317 (20.03)
2019	1083 (16.47)
2020	817 (12.42)
2021	835 (12.70)
Duration of the Prescription	
Mean Rx Duration, days (refills)	30 (2.36)

Neurostimulant Rx Frequency in IS (n= 2838) and TBI (n=2474)	
Ischemic Stroke, n (%)	
Zolpidem	840 (29.5)
Carbidopa/Levodopa	469 (16.5)
Ropinirole	380 (13)
Methylphenidate	260 (9)
Amantadine	250 (9)
Modafinil	165 (6)
Pramipexole	137 (5)
Rivastigmine	136 (5)
Bromocriptine	69 (2)
Galantamine	29 (1)
Amphetamine	28 (1)
Guanfacine	24 (1)
Atomoxetine	22 (1)
Lisdexamfetamine	18 (1)
Armodafinil	6 (0.2)
Donepezil	5 (0.1)
Traumatic Brain Injury, n (%)	
Zolpidem	622 (25)
Amphetamine	431 (17)
Carbidopa/Levodopa	230 (9)
Methylphenidate	215 (9)
Ropinirole	181 (7)
Amantadine	137 (5.5)
Guanfacine	129 (5)
Lisdexamfetamine	127 (5)
Rivastigmine	101 (4)
Atomoxetine	94 (4)
Pramipexole	80 (3)
Modafinil	71 (3)
Galantamine	38 (1.5)
Bromocriptine	11 (0.4)
Armodafinil	7 (0.3)

CONCLUSION

- There were 6576 neurostimulant prescriptions in patients with neurological injuries in Virginia from 2015-2021 and the number of prescriptions was highest in patients with IS and TBI.
- The highest frequency of neurostimulant prescriptions per year was approximately 20%.
- The most prescribed neurostimulants were zolpidem, carbidopa/levodopa, amantadine, ropinirole, methylphenidate, and amphetamine.

Disclosures
- Authors have nothing to disclose.