

Treatment Patterns in Parkinson's Disease

Michael Serbin and Chuck Yonan
Neurocrine Biosciences, Inc., San Diego, CA

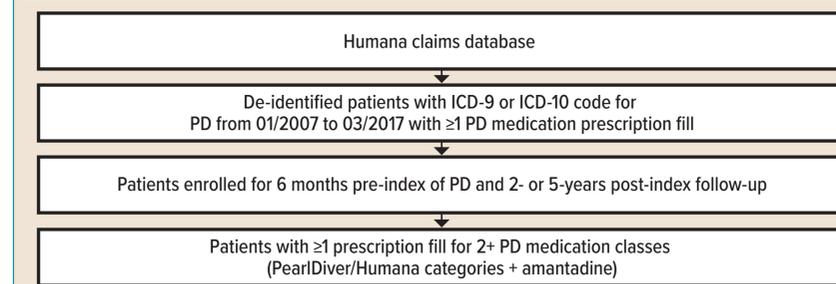
INTRODUCTION

- Carbidopa/levodopa (CD/LD) remains the most effective treatment for the management of motor symptoms of Parkinson's disease (PD)¹
- However, adjunctive medications are often required to manage end-of-dose motor fluctuations due to the short half-life of CD/LD and changes that can occur with disease progression²
- Development of a unified treatment approach that allows for the continued benefits of levodopa while reducing the risk of motor complications and fluctuations remains a major unmet need³
- The selection of adjunctive treatment(s), which have different mechanisms of action, may be based on the patient's symptoms and degree of functional impairment, as well as the availability of (e.g., access, cost) PD medications⁴⁻⁶
- Using a healthcare claims database, this study was conducted to examine the utilization of different medication classes as first- or second-line therapies for the treatment of PD

METHODS

- A retrospective analysis was conducted using the Humana[®] claims database (22 million patients) using PearlDiver Software and de-identified patient data; each patient had a unique numeric identifier
 - The analysis included data from all patients with diagnosed PD (per the International Statistical Classification of Diseases [ICD]-9 or ICD-10 coding) from January 2007 to March 2017 who were enrolled for 6 months pre-index of PD and had 2- or 5- years of follow-up data after diagnosis (Figure 1)
- PD prescriptions were tracked during the 2- and 5-year follow-up periods to assess patients' medications by class/drug
- First- and second-line treatments were further analyzed in patients who had ≥2 classes/drugs at any time during the follow-up periods; no analyses were conducted to determine whether multiple PD classes/drugs were prescribed concomitantly or how far apart they were prescribed
- Prescriptions included the following PD classes/drugs: CD/LD, catechol-O-methyltransferase inhibitors (COMT-I), monoamine oxidase B inhibitors (MAOB-I), dopamine agonists (DA), antimuscarinics, and amantadine

Figure 1. Patient Selection and PD Classes/Drugs



Class	Brand Name	Drug Name
CD/LD (alone)	Sinemet [®] , Rytary [®]	Carbidopa/levodopa
	Stalevo [®]	Carbidopa/levodopa/entacapone
COMT-I	Comtan [®]	Entacapone
	Tasmar [®]	Tolcapone
DA	Requip [®] , Requip XL [®]	Ropinirole, Ropinirole ER
	Apokyn [®]	Apomorphine
	Mirapex [®] , Mirapex ER [®]	Pramipexole
	Neupro [®]	Rotigotine
	N/A	Bromocriptine
MAOB-I	Azilect [®]	Rasagiline
	Zelapar [®]	Selegiline
Antimuscarinic	N/A	Trihexyphenidyl
	N/A	Benzotropine
Amantadine	N/A	Amantadine

CD/LD, carbidopa/levodopa; COMT-I, catechol-O-methyltransferase inhibitors; DA, dopamine agonist; ER, extended release; MAOB-I, monoamine oxidase B inhibitors; N/A, not applicable; PD, Parkinson's disease.

RESULTS

- Characteristics of patients included in the analysis are presented in Table 1

- All patients were indexed with PD and had at least 6 months of pre-index data
- The 2-year follow-up cohort included 18,285 patients, 11,945 (65.3%) of whom had prescriptions filled in 1 PD medication class
- The 5-year follow-up cohort included 5,480 patients, 2,672 (48.8%) of whom had prescriptions filled in 1 PD medication class

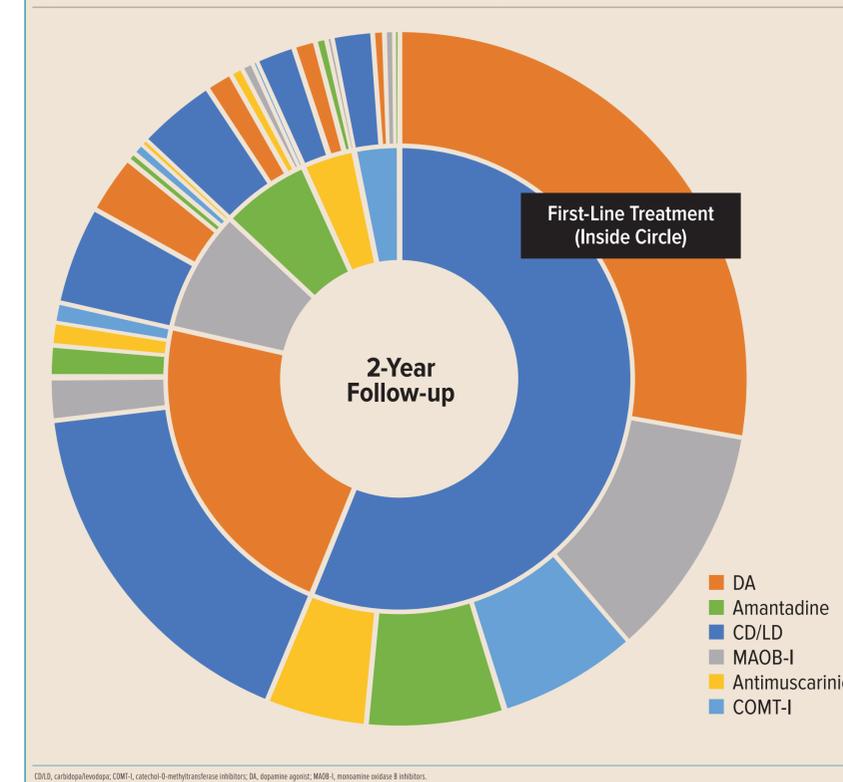
Table 1. Patient Characteristics

Characteristic	2-Year Follow-up (N=18,285)	5-Year Follow-up (N=5,480)
Male, n (%)	9,846 (53.8)	2,849 (52.0)
Age category, n (%)		
≤39 years	35 (0.2)	8 (0.1)
≥40 to 49 years	207 (1.1)	77 (1.4)
≥50 to 54 years	308 (1.7)	117 (2.1)
≥55 to 59 years	555 (3.0)	184 (3.4)
≥60 to 64 years	947 (5.2)	276 (5.0)
≥65 to 69 years	2,723 (14.9)	936 (17.1)
≥70 to 74 years	4,060 (22.2)	1,301 (23.7)
≥75 to 79 years	4,033 (22.1)	1,232 (22.5)
≥80 to 84 years	3,123 (17.1)	864 (15.8)
≥85 to 89 years	917 (5.0)	129 (2.4)
≥90 years	1,377 (7.5)	356 (6.5)
Race, n (%)		
White	15,650 (85.6)	4,704 (85.8)
Black	1,351 (7.4)	406 (7.4)
Other/Unknown	1,284 (7.0)	370 (6.8)
Number of PD classes/drugs, n (%) ^a		
One	11,945 (65.3)	2,672 (48.8)
Two	4,298 (23.5)	1,212 (22.1)
Three	1,624 (8.9)	1,130 (20.6)
Four	324 (1.8)	374 (6.8)
Five	54 (0.3)	82 (1.5)

^aPatients with ≥1 prescription within a class/drug (e.g., 2 different dopamine agonists) were counted once for that class/drug. PD, Parkinson's disease.

- In the 6,300 (34.5%) patients who filled 2 or more PD prescriptions during the 2-year follow-up period, the most common first-line treatment was CD/LD (56.0%), followed by DA (22.3%) and MAOB-I (8.5%); CD/LD was either a first- or second-line treatment in 84.8% of patients (Figure 2)
- In the 3,527 patients initiated on CD/LD, common second-line treatments were DA (49.4%), followed by MAOB-I (19.4%), COMT-I (11.5%), amantadine (11.5%), and antimuscarinics (8.2%)

Figure 2. First- and Second-Line Treatments During 2-Year Follow-up (N=6,300)



CD/LD, carbidopa/levodopa; COMT-I, catechol-O-methyltransferase inhibitors; DA, dopamine agonist; MAOB-I, monoamine oxidase B inhibitors.

CONCLUSIONS

- While individual PD treatment regimens vary, 2- and 5-year analyses of a large US claims database indicated that CD/LD was the most common first-line therapy, with DA and MAOB-I being the most common second-line therapies to augment CD/LD treatment
- Further research is needed to better understand the comparative safety and effectiveness between adjunctive drug classes to assist in guiding appropriate clinical therapy and developing a rational treatment approach for PD

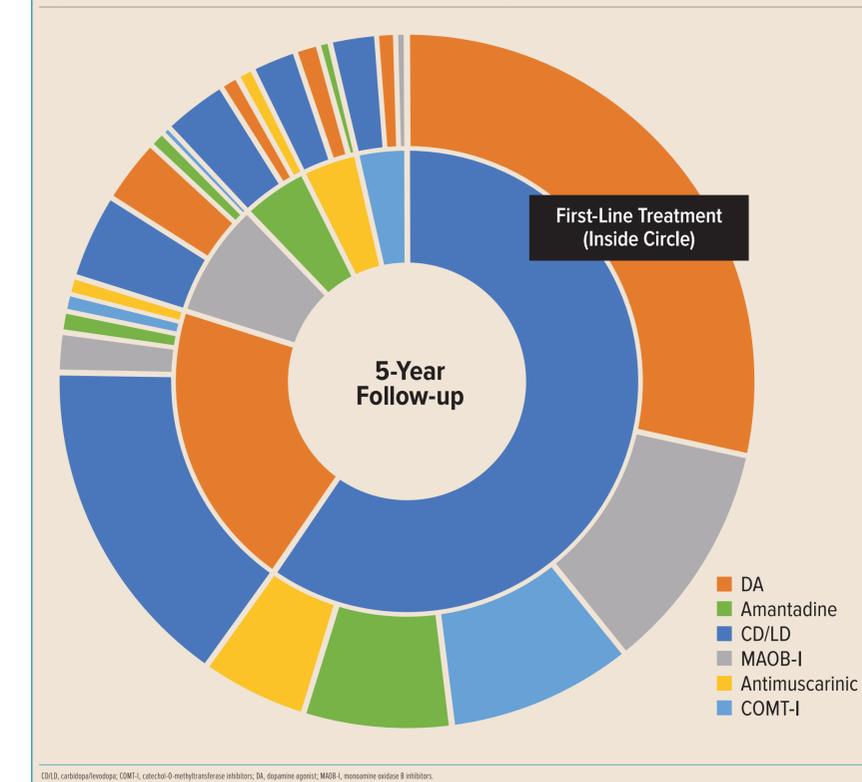
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- In the 2,798 (51.0%) patients who filled 2 or more PD prescriptions during the 5-year follow-up period, the most common first-line treatment was CD/LD (58.8%), followed by DA (19.9%) and MAOB-I (8.0%); CD/LD was either a first- or second-line treatment in 85.2% of patients (Figure 3)
- In the 1,644 patients initiated on CD/LD, common second-line treatments were DA (47.7%), followed by MAOB-I (18.0%), COMT-I (14.4%), amantadine (11.7%), and antimuscarinics (8.2%)

Figure 3. First- and Second-Line Treatments During 5-Year Follow-up (N=2,798)



CD/LD, carbidopa/levodopa; COMT-I, catechol-O-methyltransferase inhibitors; DA, dopamine agonist; MAOB-I, monoamine oxidase B inhibitors.

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