

## PRESCRIBING TRENDS IN PARKINSON'S DISEASE AND RISK FACTORS INVOLVED WITH LEVODOPA INDUCED MOTOR COMPLICATION IN A TERTIARY CARE HOSPITAL

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### ABSTRACT

Parkinson's disease is the second most common neurodegenerative disorder and also a common movement disorder. The progression of Parkinson's disease and the degree of impairment vary from person to person. The aim of this study was to ascertain the prescribing pattern of anti- Parkinson drugs and also the risk factors involved with motor complications developed by the use of levodopa. 60 patients with clinically definite idiopathic parkinson's disease were studied. Among the patients, number of anti-parkinson's drugs prescribed increased with disease duration and severity. From the study result, most

commonly prescribed anti Parkinson drug was levodopa carbidopa combination. Along with this drug anti-cholinergic and dopamine agonist were mostly prescribed. commonly prescribed concurrent drugs other than anti Parkinson drugs are for cardiac, mental and neurological disorder. Among 60 patients, 31.7% were experiencing dyskinesia 65% were have OFF periods. Total dose of levodopa, levodopa equivalent daily dose, disease duration and treatment duration with levodopa has significant association with dyskinetic movement. Our study provides a basic knowledge about the drug prescribing pattern in the treatment of parkinson disease and also highlight the known risk factors of levodopa induced motor complication.

**KEYWORDS:** Parkinson Disease, Levodopa, Dyskinesia, Prescribing Pattern.

## INTRODUCTION

Parkinson's disease is a neurodegenerative disorder that affects predominantly dopaminergic neurons in a specific area of brain ie, substantia nigra. Parkinson's disease ranks among the most common late life neurodegenerative disease affecting approximately 1.5 to 2% of people aged 60 years and older.<sup>[1]</sup> The four cardinal motor manifestations of PD are tremor at rest, rigidity, bradykinesia and postural instability. Not all patients initially presented with all of the classical signs of the disorder; there may be only one or two.<sup>[8]</sup> In IPD, progression tends to be slow and variable. *Hoehn and Yahr scale* (HY) is used to assess the progression of the disease over the years. The scale was originally described in 1967 and included stages 0 to 5. The modified hoehn and yahr scale include 1.5 and 2.5 stages too.

The most commonly used medications for the treatment of Parkinson disease are levodopa/carbidopa combination, catechol-Omethyltransferase (COMT) inhibitors - entacapone and tolcapone, dopamine receptor (DA) agonists - bromocriptine, pramipexole and ropinirole, monoamine oxidase type B (MAO-B) inhibitors - selegiline and rasagiline, anticholinergics - trihexyphenidyl and NMDA receptor antagonist - amantadine.

In idiopathic PD a good response to levodopa is the rule, which has also become a part of diagnostic criteria for this disease.<sup>[2]</sup> However, the long-term application of levodopa has been followed with, amongst others, the occurrence of motor complications which generally involve the fluctuation of motor response and the occurrence of involuntary movements or dyskinesia.<sup>[3,4]</sup> The pathogenesis of LID is not well understood.<sup>[5]</sup> The level and duration of drug exposure that is required to induce dyskinesia is regulated by the extent of the degeneration.<sup>[6,7]</sup> Typically, dyskinesia and motor fluctuations are temporally related with rise and fall in plasma levodopa level. As the disease advances, the same dosage of levodopa required to relieve parkinsonian symptoms may also cause dyskinesia. The Unified Parkinson's Disease Rating Scale (UPDRS) is most widely used clinical rating scale for Parkinson's disease (PD). This study was designed to evaluate the prescribing pattern of anti-parkinson drugs and risk factors which most significantly impact the appearance of dyskinesia and motor fluctuation during the chronic use of levodopa.

## METHOD

This was a hospital based prospective observational study in 60 patients in the Department of neuro medicine at Pushpagiri Medical College Hospital. The selection of patients will be based upon the inclusion and exclusion criteria. The data collected from patient case reports

and directly from patents. The data from case records of patient above 40 years, of both sexes, diagnosed with IPD were included for the study. Patients with Secondary parkinsonism syndromes related to drugs, metabolic disorders or exposure to toxins and psychiatric illness were excluded.

The main patient demographic and clinical data (sex, age, onset of the disease and its duration, symptoms) were obtained directly from the patients and/or from close relatives (spouse and children). Information about current drug treatment (ie, generic and trade name, dose, frequency and indication for use) were collected. All patients are evaluated based on the Unified Parkinson Disease Rating Scale (UPDRS) Part IV<sub>A</sub> and IV<sub>B</sub> and are staged on the basis of Hoehn & Yahr scale. Among other facts treatment duration, disease duration, levodopa dose and total levodopa equivalent daily dose (LEDD) are included.

## RESULT AND DISCUSSION

On the basis of inclusion and exclusion criteria, 60 patients were selected over a period of six months for the present study. Among 60 patients 56.7% were males and 43.3% were females. The disease has a slight male predominance. In the study population, majority of patients experienced tremor, bradykinesia, rigidity. Patients with parkinsons about 43.3% are belongs to H&Y stage 2.5. Levodopa + carbidopa combination is the most commonly prescribed antiparkinson medication. Trihexyphenidyl, Amantadine, Pramipexole, Rasagiline and Ropirinole are other anti parkinsons drug used as add-on therapy with levodopa.

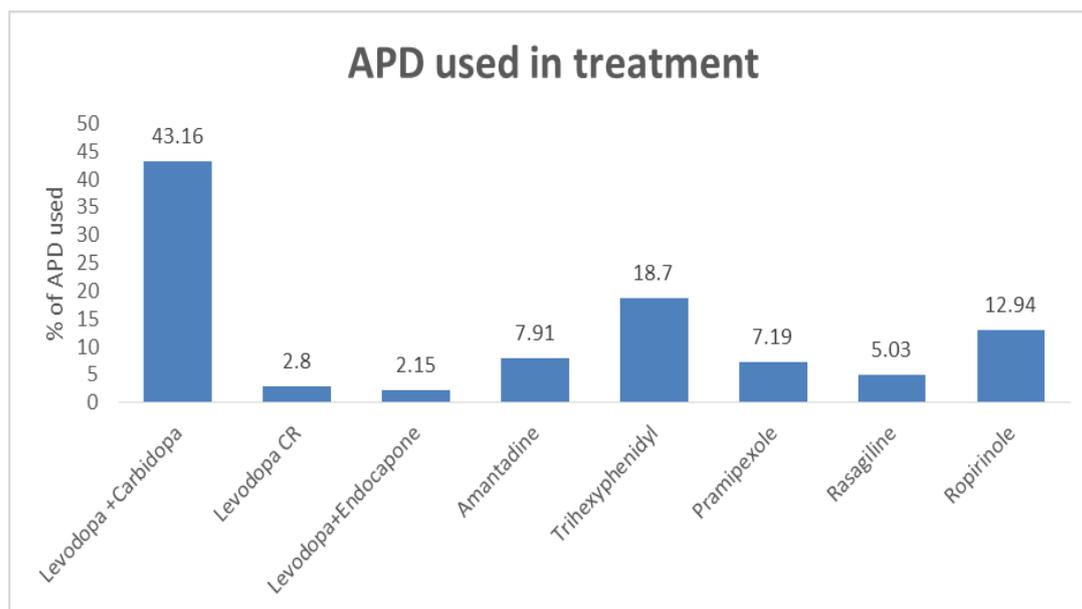
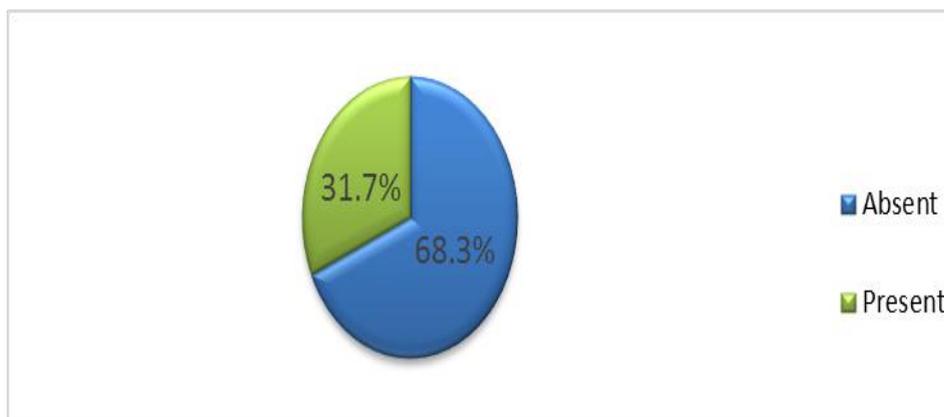


Figure 1: Distribution of patients based on anti Parkinson drugs used in treatment.

Among 60 patient, other concurrent drug were prescribed with APD are Antiplatelet Drugs, Antihypertensives, Antilipidemics, Proton Pump Inhibitors, Antidepressants, Laxatives, Antidiabetics And Vitamins. In the study population, majority were taking levodopa for 5 – 10 year. Among 60 patients, most of the patients were taking 200 – 400mg of levodopa equivalent daily doses. Motor complication in IPD patients were assessed by using UPDRS Part IV<sub>A</sub> and IV<sub>B</sub>. Among 60 patients who were receiving levodopa preparation, 31.7% experience dyskinesia and 65% were experiencing off period between the dose.



**Figure 2: Distribution of patients based on presence of dyskinesia.**

Among 19 patients with dyskinesia, 68.3% patients have experienced slight dyskinesia and trouble in doing things during dyskinetic period. Among 39 patients with OFF period 31.7% of them experienced mild motor fluctuation and trouble in doing things during OFF period. Among the 60 patients, 65% of patients experience morning dystonia.

**Table 1: Association between patient variables and dyskinesia.**

Variables	P Value*
Male	>0.05
Age >60	>0.05
Hoehn And Yahr Stage 2.5	>0.05
LEDD >500mg	<0.05
Total Dose Of Levodopa >500mg	<0.05
Disease Duration >10yr	<0.05
Treatment With Levodopa	<0.05
• Chi-square test	

Total dose of levodopa, levodopa equivalent daily dose, disease duration and treatment duration with levodopa has significant association with dyskinetic movement. Therefore dose adjustment must be considered while prescribing levodopa.

## CONCLUSION

Our study provides a basic knowledge about prescribing pattern in parkinson's disease and also the risk factors involved with levodopa induced motor complication. From the study, it is evident that total dose of levodopa, levodopa equivalent daily dose, disease duration and treatment duration with levodopa has significant association with dyskinetic movement. Prescription pattern analysis was carried out. Levodopa-carbidopa combination drug is most commonly prescribed drug. The study also investigate the prevalence of motor complications in patients with IPD and the prevalence was found that 31.7% patients experienced dyskinesia and 65% patients experienced off state.

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