

Use of Therapeutic exercises in Drug Induced Parkinsonism: A Case Report

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Abstract: Drug Induced Parkinsonism (DIP) is defined by the appearance of a parkinsonian syndrome in patients treated with drugs that impair dopamine function.¹ DIP has been documented for more than half a century as a common complication of antipsychotic therapy. This case report describes the use of therapeutic exercises for rehabilitating the patient with Drug Induced Parkinsonism. A 62 year old man with known case of bipolar disorder since 10 years and was on medicine lithium carbonate which is an antipsychotic. He came from outdoor hospital to Pravara Rural Hospital with complaints of weakness in upper & lower extremities and tremors for medical and physiotherapy management. Physiotherapy management was given for 5 days a week for 5 weeks. Unified Parkinson's disease Rating Scale (UPRDS), Modified Hoehn and Yahr Staging, Schwab and England activities of living scale was used. After 5 weeks of Medical, Physiotherapy management and withdrawal of lithium carbonate drug presented significant improvement in postural instability, gait retraining.

Keywords: Drug Induced Parkinsonism, UPDRS, Modified Hoehn and Yahr Staging, Schwab and England Activities of Daily living Scale.

Abbreviations: DIP- Drug-Induced Parkinsonism, UPRDS- Unified Parkinson's Disease Rating Scale.

Introduction: Drug Induced Parkinsonism (DIP) is defined by the appearance of a parkinsonian syndrome in patients treated with drugs that impair dopamine function.¹ DIP is the second-most-common etiology of parkinsonism in the elderly after Parkinson's disease (PD) Drug-induced parkinsonism (DIP) has been recognized for more than half a century as a common complication of antipsychotic therapy. It was initially considered to be present in 4 – 40% of patients treated with the first neuroleptics, but it has been reported as a complication of treatment with multiple compounds including calcium channel antagonists, antiemetic's, drugs for the treatment of vertigo, antiarrhythmic, antidepressants.¹ Lithium is an effective medication for the treatment of bipolar disorder. Drug-Induced Parkinsonism is typically related to antipsychotics and rarely to Lithium. It is important to recognize that even in the presence of a normal lithium serum level, patients may present with parkinsonian symptoms. Lower therapeutic serum lithium levels should be considered in the geriatric bipolar patient population given the increased risk for drug-drug interactions and increased vulnerability for adverse health effects.⁴

It has been found that some of the drugs that produce DIP may cause direct neurotoxic damage to the nigrostriatal dopamine neurons. In addition, it is now evident that some individuals, perhaps with genetic variants of genes involved in familial Parkinson's disease, are especially susceptible to this complication.¹ Patients with DIP respond to treatment with L-Dopa and dopamine agonists less well than patients with idiopathic PD. Most patients improve, at least partially, after the withdrawal of the offending drugs.¹ Over the time biggest challenge encountered in DIP is to differentiate it from Idiopathic Parkinson's Disease (IPD). Any patient presenting to out-patient department with symptoms suggestive of Parkinsonism syndrome should undergo detailed history about medication taken during past year. DIP is more common in elderly individual with subacute onset of symptoms suggesting bilateral and symmetrical involvement. Though, asymmetrical involvement is seen in IPD after 6th decade of life but is also seen in DIP case reports. In most cases of the DIP, levodopa has no effect on the patient's symptom complex in comparison to IPD. Incidence of DIP is 1.0 new cases overall per 100,000 persons per years according to a study by Lewy Body Dementia Association.³ Although DIP shares clinical features with PD, there are no known histologic changes in the brain of person's who experience DIP. The measurement of homovanillic acid (HVA) in the cerebrospinal fluid (CSF) may be useful to differentiate DIP from idiopathic PD. HVA levels in patients with idiopathic PD are slightly reduced as compared to DIP. Positron emission tomography studies have shown that blockade of 75% to 80% of postsynaptic D2 receptors results in motor features of Parkinsonism. Alternatively, other drugs with no significant D2 affinity also produce DIP, indicating that dopamine receptor blockade is not the sole mechanism.² Physiotherapy intervention is an important adjunct to pharmacologic treatment along with withdrawal of lithium carbonate drug. It improved neurologic symptoms (eg, tremor, bradykinesia, and rigidity), walking ability, Activities of Daily Living, and Quality of Life.⁵

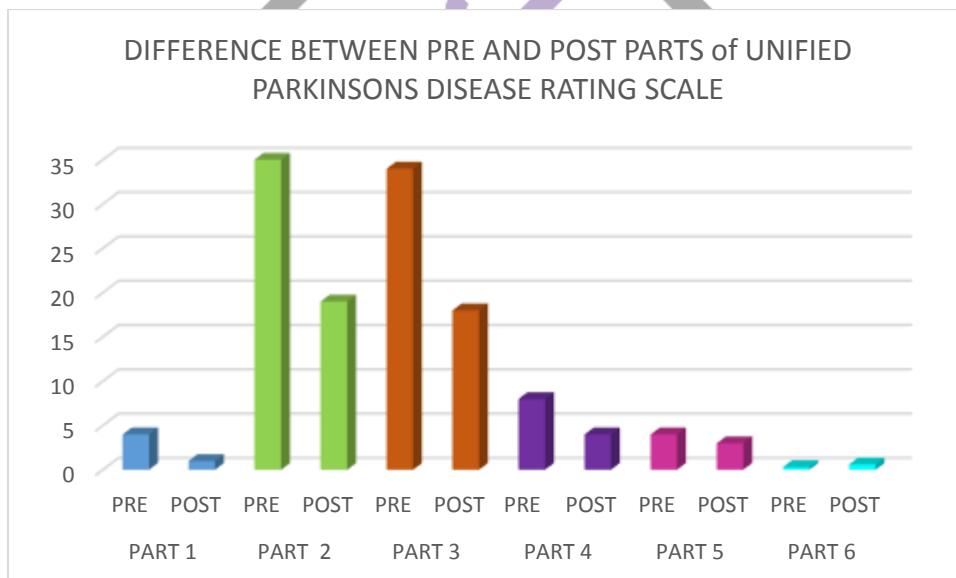
History of patient: 62 years old male with known case of bipolar disorder was on medication lithium carbonate since 10 years, came to Pravara Rural Hospital (PRH) from outdoor hospital for further Medical and Physiotherapy management. After thorough Physiotherapy assessment, it was found that the patient had difficulty in bed mobility, bradykinesia, weakness in bilateral upper and lower extremities, trunk instability, intentional tremors and hypokinetic voice. After consultation with psychiatrist his lithium carbonate medication was stopped and medical management for Parkinsonism with L-dopa and other medications were started along with Physiotherapy intervention. Physiotherapy treatment was given for 5 times a week for 5 days.

Physiotherapy Intervention:

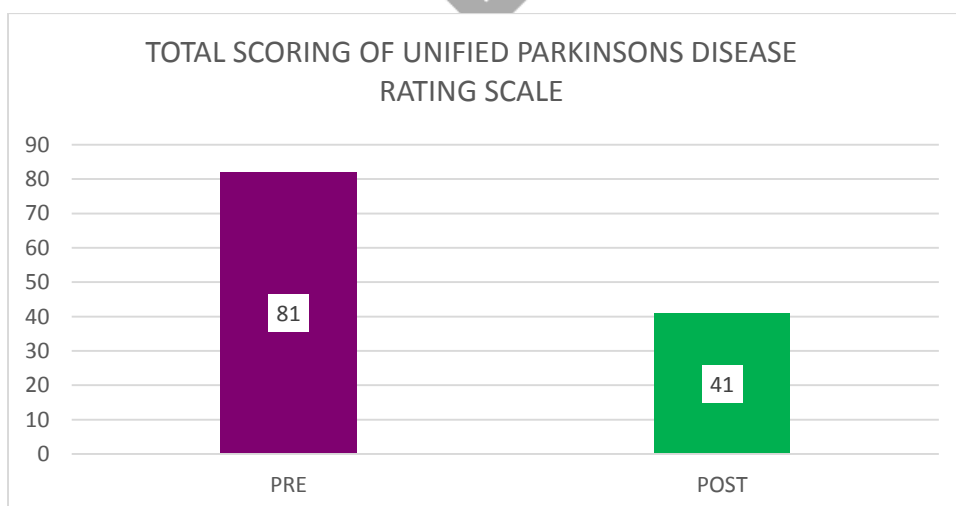
After evaluating the patient on the basis of problems list, short term and long term goals were planned and discussed with the patient. Immediately Physiotherapy treatment was started for 5 days a week for 1 hour with breaks in between to rest. On Physiotherapy assessment, Unified Parkinson’s Disease Rating Scale (UPDRS) was used to document overall effects of the disease. It is a composite scale which has six sections, which also includes Modified Hoehn and Yahr staging, Schwab and England activities of daily living scale. Protocol was individualized, based on specific impairments and patient goals. Initially, the treatment protocol started with bed mobility training. This included, rolling from side- to-side, supine to side lying, side lying to sitting, pelvic bridging activity, abdominal curls initially with assistance progressed to independent activities. Gentle Passive Range of Motion (ROM) progressed to Active ROM including relaxation exercises with gentle rocking in a chair, stretching to hamstring and calf muscles. Dynamic balance activities in sitting including reach-outs, perturbations from side-to-side and progressed to standing on stable surface which was progressed to unstable surface such as foam mat. Later Sit to stand was initiated with assistance of two therapist from each side which was progressed to with assistance of only walker. Gait training was designed to lengthen diminished arm swing and trunk movements was initially started with help of mirror feedback and auditory cueing of therapist in parallel bars with pelvic belt for support proceeded to gait training on walker with assistance of a therapist and then only with walker, then with cane under supervision and visual & auditory cueing. UPDRS including all parts with Modified Hoehn and Yahr staging, Schwab and England activities of daily living scale was reassessed after 5 weeks and significant improvement was seen in pre and post scores. As the patient wanted to go back home as he stays far away from hospital. He was provided with a home based program to perform the exercises daily at home.

Results:

Graph 1.1: Pre-Intervention and Post-Intervention scores of part 1 to part 6 of UPDRS



Graph1.2: Pre-Intervention and Post-Intervention scores of Unified Parkinson’s Disease Rating Scale.



Discussion: The purpose of study was to perceive the improvement in patient with Drug induced Parkinsonism after receiving Physiotherapy intervention, Medical management and withdrawal of lithium carbonate for 5 weeks. The primary aim of the study was to improve trunk instability and gait retraining. After the intervention, improvement was seen in UPDRS, Total pre-intervention score was 81 and total post-intervention score was 41. It showed the patient has improved in various aspects of the scale like mentation, behavior and mood, Activities of daily living during 'on' and 'off', motor examination, complication and other complication of therapy. Thus, the improvement was seen in all domains of Unified Parkinsons Disease Rating Scale. The literature documents numerous effective interventions for improving balance and mobility.⁸

According to Christoph R et.al, Physical therapy plays an important role in the management of Parkinson's disease providing strategies to improve physical capacity and to overcome pharmaco-resistant motor symptoms such as complex disturbances of gait, balance, and posture at different stages of the disease. Although physical therapy provides clinically meaningful benefits for Parkinson's disease patients with improvement in the UPDRS motor score.⁶

Improvement was seen in Modified Hoehn and Yahr Staging of disease. It was improved from stage 4 to stage 3 which contains severe disability to mild to moderate bilateral disease.

Nieuwboer A et.al, studied to evaluate gait parameters in a patients with PD. The author had used Hoehn and Yahr Staging as one of the outcome which showed gait parameters can be modified after a short-term rehabilitation program and predict the improvement of the gait function after rehabilitation.⁷

Improvement was seen in Schwab and England activities of daily living scale from 30% i.e, with effort, now and then does a few chores alone or begins alone. Much help needed. Improved to 60% i.e, 60% = some dependency. Can do most chores, but exceedingly slowly and with much effort. Errors; some impossible.

Conclusion: Therapeutic exercises showed improvement in patients with Drug Induced Parkinsonism. Significant beneficial changes occurred after measuring the UPDRS, Modified Hoehn and Yahr Classification of Disability Scale, Schwab and England activities of daily living after receiving of therapeutic exercises for 5 days a week for 5 days.

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