Therapeutic Effect of Unani Formulation at Early Stage of Parkinson's Disease (Raasha): A Case Series

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Abstract

Background: Parkinson's disease (PD) is a progressive neurodegenerative disorder marked by the selective loss of dopaminergic neurons, often driven by oxidative stress, mitochondrial dysfunction, and neuroinflammation. Experimental models commonly utilize neurotoxins such as 6-hydroxydopamine (6-OHDA), MPTP, and Rotenone to replicate PD-like pathology via reactive oxygen species (ROS)-mediated neuronal damage. **Methods:** This clinical study evaluated the therapeutic potential of a Unani polyherbal decoction in three patients (two males, one female) aged 40–80 years with Parkinsonism. Each received 50 mL of the formulation twice daily for 90 days. Motor function was assessed using the Unified Parkinson's Disease Rating Scale (UPDRS) before and after treatment. **Results**: Post-treatment assessments revealed notable improvements in UPDRS scores: Case 1 (16.7%), Case 2 (21.7%), and Case 3 (26.3%). Statistical analysis using a paired t-test demonstrated a significant reduction in motor symptoms ($t = 6.3$, $p < 0.001$), suggesting potential therapeutic efficacy. **Conclusions:** The intervention appeared safe and yielded promising motor improvements. However, the absence of a control group and the limited sample size constrain generalizability. Future studies should adopt randomized controlled designs with larger cohorts to validate these findings. Moreover, incorporating mental health assessments (e.g., stress, anxiety, depression) may enhance understanding of the neuropsychological dimensions of Parkinsonism and its response to integrative therapies.

Keywords: Parkinson's disease, Neuroprotective, Antioxidant, Antiapoptotic, Unani treatment, Raasha

Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by the selective degeneration of dopaminergic neurons in the substantia nigra pars compacta, leading to motor dysfunction, behavioural changes, and cognitive decline. The pathogenesis of PD is multifactorial, encompassing idiopathic cases with no identifiable cause, genetic mutations (e.g., SNCA, LRRK2, PARKIN), environmental exposures (e.g., pesticides, heavy metals), and age-related neurobiological deterioration. In contrast, secondary Parkinsonism may result from pharmacological agents (e.g., antipsychotics), post-infectious sequelae, neurotoxic insults, or cerebrovascular and metabolic disorders (1–4).

PD is the second most prevalent neurodegenerative disorder globally, with an estimated point prevalence of 1–2 per 1,000 individuals in the general population and 1–3% among those aged ≥65 years (5,6). Current pharmacotherapeutic strategies—including levodopa, dopamine agonists, monoamine oxidase B (MAO-B) inhibitors, anticholinergics, amantadine, and catechol-O-methyltransferase (COMT) inhibitors—primarily target symptomatic relief by modulating dopaminergic transmission. However, none of these agents have demonstrated disease-modifying potential, underscoring the urgent need for neuroprotective interventions (7).

Emerging research highlights the role of oxidative stress (OS), mitochondrial dysfunction, and neuroinflammation in PD pathophysiology. Experimental models employing neurotoxins such as 6-hydroxydopamine (6-OHDA), 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), and Rotenone replicate PD-like pathology via reactive oxygen species (ROS)-mediated apoptosis and dopaminergic neuronal loss (8).

In this context, ethnomedical systems such as Unani medicine offer promising therapeutic avenues. Although classical Unani texts do not explicitly define PD, analogous symptomatology is described under Raasha (tremor), with historical references by Hippocrates (Buqrat), Rhazes (Al-Rhazi), and Avicenna (Ibn Sina) detailing tremor-related conditions and their management (9–10). Unani nosology further encompasses terms such as Istirkha wa Falij (paresis/paralysis), Zouf-e-Aasab (neural weakness), Ikhtelaj-e-Aziat (muscle twitching), and Tasallub-e-Mutaddad (rigidity), reflecting a holistic understanding of neuromotor dysfunction (9–14).

Pathophysiologically, Unani medicine attributes tremors to Sue-e-Mizaj (temperamental imbalance), which disrupts the transmission of vital energy (Quwa) to the nerves, resulting in partial functional decline and irregular motor activity. Unani pharmacotherapy emphasizes the use of neuroprotective botanicals—such as Mucuna pruriens, Anacyclus pyrethrum, Acorus calamus, Withania somnifera, Hyoscyamus niger, and Strychnos nux-vomica—which contain bioactive compounds with antioxidant, anti-inflammatory, and neurotransmitter-modulating properties. These agents offer a gentler therapeutic profile compared to synthetic drugs and may contribute to the integrative management of neurodegenerative disorders.

This study aims to evaluate the clinical efficacy of a standardized Unani polyherbal formulation in patients with Parkinsonism, with a focus on motor symptom improvement and potential neuroprotective mechanisms.

Material and Methods

Study design and setting

This study focuses on assessing the efficacy and safety of a Unani formulation in patients with Parkinson's disease. Data were gathered from the Outpatient Department of Ajmal Khan Tibbiya College and Hospital, Aligarh Muslim University (A.M.U.). All collected information was treated with strict confidentiality, ensuring the privacy and anonymity of participants throughout the research process.

Participants: Patients are selected on the basis of exclusion and inclusion criteria. Initially 5 individual express interest and complete questionnaires.Following through review of inclusion and exclusion criteria 5 participant (3M, 2F) met criteria for inclusion in study. However, one male and one female patient was unable to continue the follow up visit resulting in his withdrawal from study.
The study was conducted on the patient attending Moalejat OPD and IPD at Ajmal Khan Tibbiya College & Hospital, AMU, Aligarh. In this case series,a clinical diagnosed of Parkinson disease who were willing to undergo the Unani medicine treatment.Informed consent was taken from all the patients.

Intervention

Decoction of Unani medicine that contains Mucuna prurience, Anacyclus pyrethrum (L.), Lag., Acorus calamus L., Withania somnifera andHyoscyamus Niger Linn(tukhme-konch, aqarqarha waj, asgandhand ajwain khurasani respectively) was given in the morning and in the evening for 12 weeks. This 12 weeks of study duration was divided into six visits of follow up made on the 15th, 30th, 45th, 60th, 75th and 90th day. At every visit, patients were asked for any improvement or worsening in their clinical symptoms. No concomitant treatment was allowed during the protocol period.
DOSE –decoction of 50mlof Unani formulation each time and used as morning and evening dose.

Ethical considerations

The study was conducted in accordance with the guidelines of Declaration of Helsinki and Good Clinical Practices for Clinical Trials in Ayurveda, Siddha, and Unani Medicine.

Inclusion Criteria:

Participants were required to have a confirmed clinical diagnosis of Parkinson’s disease, established by a clinician based on the presence of cardinal motor

symptoms—bradykinesia, resting tremor, rigidity, and postural instability—and clinical examination. Additionally, they had to be classified within stages< 4 on the Hoehn and Yahr scale.
Age between 40-80 yrs and either gender

Exclusion Criteria:
Individuals with neurological conditions other than Parkinson's disease—including idiopathic PD, primary PD, Parkinson-plus syndromes, and secondary parkinsonism—were excluded from the study. Additional exclusion criteria encompassed patients with cardiac or renal insufficiency, intellectual disabilities, history of head trauma or injury, and those undergoing deep brain stimulation (DBS).Pregnant & lactating women. In addition to these criteria, we established specific circumstances as dropout indicator including. Withdrawal of informed consent. >2unexplained absence from intervention protocol. Occurrence of moderate to severe adverse effect.Taking warfarin, selective serotonin reuptake inhibitors (SSRIs), monoamine oxidase inhibitors (MAOIs), or diuretics.

Patient's Information
Case 1
A 55-year-old male patient presented to the outpatient department with masked facies and a slightly stooped posture. He reported a two-year history of bradykinesia, resting tremor, and limb stiffness. His primary complaint was difficulty initiating movement, initially manifesting as clumsiness and progressively leading to significant impairment in daily activities such as rising from a seated position, walking, combing hair, buttoning clothes, and eating.
The tremor has been persistent for the past few years, predominantly affecting the hands and occurring mainly at rest. It began in the left hand and progressed to the right after four months. He noted that the tremor worsens with emotional stress but diminishes temporarily with voluntary movement.
Rigidity has contributed to generalized stiffness and is responsible for his flexed posture. He also reported a change in voice quality, describing it as slow and monotonous. Recently, he has experienced increasing weakness in both upper and lower limbs, along with gait instability.
There are no history of headache, vomiting, seizures, diplopia, nasal speech, nasal regurgitation, or bowel and bladder dysfunction. No sensory deficits were reported. Regarding higher mental functions, the patient exhibits mild depressive symptoms but no cognitive decline.On examination, his blood pressure was 140/90 mmHg and pulse rate were 90 bpm.

Case 2

A 70-year-old male patient presented with a 1.5-year history of movement difficulties. He reported a sensation of his feet feeling "stuck to the floor," along with marked difficulty in initiating movement. The patient denied any pain, tenderness, or swelling in the joints or feet. He also noted reduced arm swing during ambulation, with symptoms being bilaterally symmetrical.

He experienced a constant fear of falling and reported an inability to maintain a standing position unaided. There was no history of bony deformities or muscle wasting. He additionally complained of generalized weakness, loss of taste, and a diminished appetite. There was no history suggestive of dysphagia or gastroesophageal symptoms such as heartburn.

Notably, the patient reported anosmia and episodes of dizziness, particularly exacerbated on transitioning from a lying to a standing position. He denied experiencing headache, vomiting, or any recent falls from an upright position.

Case 3

An 80-year-old hypertensive female presented to the outpatient department with a chief complaint of resting tremors in the left hand, accompanied by rigidity and impaired fine motor coordination, such as difficulty with finger tapping and hand movements that exhibit deceleration and amplitude reduction mid-task. Notably, her motor symptoms tend to improve during sleep.

The tremors, described as "pill-rolling," developed gradually and are now present in both hands, with greater severity on the left side. She also reported progressive stiffness and musculoskeletal pain in the lower limbs and back, leading to significant difficulty initiating and coordinating movements. She has been unable to ambulate without support for the past year.

Her history includes multiple falls secondary to postural instability and impaired balance. Additionally, she reported sleep disturbances, mood fluctuations, depressive features, and occasional auditory hallucinations. There is no relevant family history, and aside from a seven-year history of antihypertensive therapy, she has not been on any long-term medications.

Diagnostic Criteria

The Hoehn and Yahr scale and the Unified Parkinson's Disease Rating Scale (UPDRS), including its updated version (MDS-UPDRS), (16) are used to assess the severity and progression of Parkinson's disease. The UPDRS (Unified Parkinson's Disease Rating Scale) is divided into four principal domains:Behaviour, and Mood, Activities of Daily Living, Motor Examination, Complications. Each of these domains contains portions of a total 42 items, which are further organized into four distinct subscales.

Result

Following treatment, all three patients exhibited clinically meaningful reductions in UPDRS scores. Case 1 improved from 144 to 120 (16.7% reduction), Case 2 from 157 to 123 (21.7% reduction), and Case 3 from 160 to 118 (26.3% reduction).Statistical analysis using a paired t-test revealed a significant overall effect of treatment, with $t = 6.3$ and $p < 0.001$, indicating that the observed improvements were unlikely due to chance. These findings suggest a robust therapeutic impact on motor function and symptom severity, as quantified by UPDRS, and support the efficacy of the intervention across varying baseline severities.

Discussion

Strength

In Unani medicine, neurodegenerative conditions are categorized under nervous disorders (Amrāḍ-i-A'ṣāb)and brain disorders (Amrāḍ-i-Dimāgh). Within these classifications, conditions such as tremors (Raasha), dementia (Nisyan), paralysis (Fālīj), and apoplexy (Saktā) are extensively discussed and elaborated upon in classical texts. [17, 18]

The brain's temperament (Mizaj) is characterized as cold and wet, which makes it especially responsive to various external stimuli.[19]

When a disorder impacts the entire brain, all of its Quwa (faculties) are affected collectively. In contrast, localized brain disorders influence only specific faculties or the nerves associated with the affected region [20]

Oxidative stress may be understood as burnout (Ihtiraq) of humor(Khilṭ), or as an increase in waste products (Fudlat) resulting from the decline of vital force (Quwwat Ghaziya) and expulsive force (Quwwat Dafi 'a), ultimately leading to the progressive accumulation of (waste products (Fudlat) in the body with age.[17]

The observed improvement in Parkinson's disease patients could be attributed to the variedpharmacological effects of the ingredients found in compound Unani formulations. Parkinson's disease presents notable clinical symptoms, particularly severe joint rigidity and muscle spasms. Mucuna pruriens (Tukhm-e-Konch), has shown efficacy in alleviating these symptoms and improving patient comfort. A key component, (Tukhm-e-Konch) Mucuna pruriens, contains approximately 5–7% L-DOPA, which serves as a precursor to dopamine, the neurotransmitter critically involved in motor control and mood regulation. (21)Research suggests that L-DOPA extracted from Mucuna pruriens may offer several benefits compared to its synthetic counterpart when administered to individuals with Parkinson's disease. Long-term use of synthetic L-DOPA is often associated with various side effects, whereas the natural form derived from M. pruriens appears to present a more favourable therapeutic profile.The seeds contain several bioactive compounds, such as tryptamine, alkylamines, and steroids, and serve as a rich source of L-3,4-dihydroxyphenylalanine (L-DOPA)[22]. Mucuna pruriens has been shown to contain L-DOPA at a concentration

of 40 mg per gram of plant material, representing a substantial proportion of its phytochemical composition.[23]Various preparations derived from its seeds are commonly utilized in the treatment of conditions such as rheumatoid arthritis, diabetes, atherosclerosis, neurological disorders, and male infertility.[24] Clinical trials have reported favourable outcomes in patients with Parkinson's disease. Notably, one study demonstrated that a dosage of 15 grams of crude Mucuna pruriens seed powder significantly inhibited the prolactin response induced by chlorpromazine injection, with efficacy comparable to that of 0.5 grams of L-DOPA.[25-29].

Another notable ingredient is Anacyclus pyrethrum (Aqarqarha), which is recognized for its antidepressant properties. This herb plays a significant role in alleviating depression among patients. Additionally, it functions as a memory enhancer, demonstrating positive effects in individuals with cognitive decline. Its neurotropic (Muqawwi Asab) activity may also contribute to the overall improvement in neurological function, potentially leading to a reduction in tremors and other Parkinsonian symptoms.Anacyclus pyrethrum (Aqarqarha) offers valuable therapeutic effects, notably as a nervine stimulant. Its ability to alleviate numbness and bodily pain plays a pivotal role in easing the clinical signs and symptoms associated with Parkinson’s disease. These combined properties contribute to its overall supportive impact on neurological health and patient well-being.[30]

Acorus calamus(Waj) possesses a range of therapeutic benefits that contribute to neurological well-being. Its properties include:Acting as a Munaqqie Dimagh, aiding in the removal of morbid substances from the brain. Enhancing memory and alleviating forgetfulness (Nisyan). Reducing numbness (Khadar) and discomfort in the body. Supporting Istirkha by maintaining proper muscle tone and preventing spasms. Addressing Luknate Zaban, which involves improving clarity in speech. Overall, helping to strengthen and invigorate the nervous system. [31]Acorus calamus, a traditional medicinal herb known for its role in managing central nervous system disorders, was studied for its therapeutic effects on Parkinson’s disease. Methanolic extracts of its rhizomes were administered to rats at three dosage levels—250, 500, and 750 mg/kg—using a 6-hydroxydopamine (6-OHDA) induced Parkinson’s model. The treatment significantly enhanced locomotion, motor coordination, and balance in the affected rats. Furthermore, Acorus calamus elevated the expression of tyrosine hydroxylase (TH) in the substantia nigra and boosted extracellular dopamine (DA) levels in the striatum. Western blot analysis revealed increased levels of DJ-1 protein and a reduction in α-synuclein expression following treatment, indicating neuroprotective potential.[32]

Withania somnifera (Asgand) plays a significant role in alleviating the symptoms associated with this condition. It helps reduce inflammation within the nervous system and eases pain. Additionally, it functions as a general body tonic, offering vital support in managing debilitating illnesses such as this one. By enhancing joint flexibility and strength, Asgand contributes to the reduction of extreme joint rigidity in affected

patients.[31]Withania somnifera (L.), widely recognized for its pharmacological potential, plays a vital role in the Indian Systems of Medicine with both pre-clinical and clinical applications. Studies using cellular and animal models have shown that its extracts, active compounds, and metabolites exhibit powerful antioxidant effects. These components help protect neuronal cells from toxic damage and inflammation by modulating key signalling pathways such as PI3K/Akt and MAPK, and by activating anti-apoptotic mechanisms. This neuroprotective action supports its therapeutic potential in neurodegenerative disorders like Alzheimer's, Parkinson's, and Huntington's disease. The breadth of evidence strongly supports the promising clinical value of Withania somnifera in managing a wide range of conditions. [33]
The antiparkinsonian potential of aqueous methanolic extracts from Hyoscyamus niger seeds was investigated using the MPTP-induced Parkinson's disease model in mice. The extract significantly inhibited monoamine oxidase activity and reduced the generation of hydroxyl radicals (·OH) triggered by MPP^{+} in isolated mitochondria. These neuroprotective effects suggest that the methanolic seed extract of H. niger may counteract Parkinsonism by suppressing mitochondrial oxidative stress. (34)The neuroprotective efficacy of methanolic extract from Hyoscyamus niger (MHN) seeds was examined using a stereotaxically induced rotenone model of Parkinson's disease in rats. Animals received MHN orally at doses of 125, 250, and 500 mg/kg body weight once daily for seven days, followed by unilateral intrastriatal administration of rotenone (8 μg in 0.1% ascorbic acid-normal saline). After three weeks, neurobehavioral evaluations were performed, and brain homogenates were analysed for lipid peroxidation (TBARS), total glutathione (GSH) content, and antioxidant enzyme activities—glutathione peroxidase (GPx), catalase (CAT), and superoxide dismutase (SOD). MHN treatment, which contains L-DOPA, significantly improved motor performance in actophotometer, rotarod, and Morris's water maze tests. Compared to untreated rats, MHN-treated subjects exhibited decreased TBARS levels and elevated GSH content, along with enhanced GPx, SOD, and CAT activity. Additionally, the extract demonstrated L-DOPA presence and showed strong inhibition in DPPH and ABTS in vitro antioxidant assays, as well as monoamine oxidase activity suppression [35]
The combined formulation has shown efficacy in alleviating tremors linked to various conditions and enhancing key clinical manifestations of Parkinson's disease, particularly those rooted in neuromuscular dysfunction. These remedies have been traditionally utilized for such purposes by both classical and contemporary Unani practitioners. Their therapeutic effectiveness is attributed to a synergistic blend of actions, including: purifier of morbid substances(Munaffis-e-Mawad-e-Fasida), phlegm-clearing agents(Munaffis-e-Balgham and Mukhrij-e-Balgham), general and specific tonics (Muqawwi Aam wa Khas), nervine stimulant (Muharrik-e-Aʿṣāb), warming agent (Musakkhin), antiepileptic (Dāf-e-Sar'a), beneficial in hemiplegia and facial palsy (Nāf-e-Fālīj wa Laqwa), cardiotonic (Muqawwi Qalb), brain tonic (Muqawwi Dimāgh), and deobstruent (Mufatteḥ Sudūd). The overall therapeutic

impact of the combined formulation is considered more significant than the isolated effect of any single ingredient.

Limitations

The present findings, while promising, are constrained by the absence of a control group, limiting the ability to attribute observed improvements solely to the intervention. As such, these results should be interpreted as preliminary and cannot be generalized to the broader population. To strengthen the level of evidence, future studies should incorporate larger, more diverse sample sizes and adopt randomized controlled designs. Moreover, integrating validated instruments to assess mental health parameters—such as stress, anxiety, and depression—would offer valuable insights into the bidirectional interplay between neurological function and psychological well-being, thereby enriching the clinical and mechanistic understanding of treatment outcomes.

Conclusion

The Unani system of medicine offers a diverse range of single herbs and compound formulations for managing neurodegenerative disorders (NDDs). Many plant-derived compounds exhibit antioxidant, anti-amnesic, anti-Alzheimer's, and antidepressant properties, and several have demonstrated clinical efficacy. This study explores the administration of oral Unani formulations of patients with Parkinson's disease, aiming to establish a potentially effective Unani-based therapeutic approach. The findings of the study indicate that Unani formulations evaluated were effective in alleviating the clinical signs and symptoms of Parkinson's disease. By the end of the trial, statistically significant improvements were observed. The results concluded that these Unani formulations demonstrated both clinical and statistical efficacy, and were found to be safe and beneficial for the management of Parkinson's disease across both treatment groups.

CRediT authorship contribution statement:

Author's Role

Humaira Bano: Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.
Md Hamza Ahmad: Writing – review & editing and Formal analysis.
S Javed Ali: Supervision, Investigation. Formal analysis, Data curation
Anam Fatema: Methodology, Investigation

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Declaration of conflict of interest/financial disclosures
The authors declare that they have no relevant conflicts of interest.
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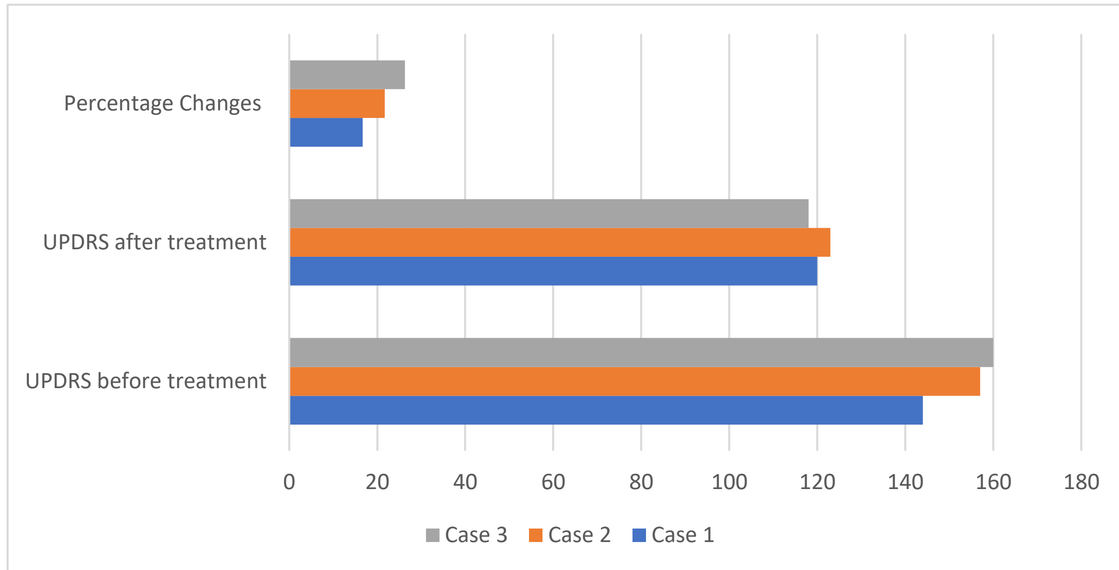
Table 1. Unani Formulation Ingredients: Traditional Names, Botanical Equivalents, and Therapeutic Dosage

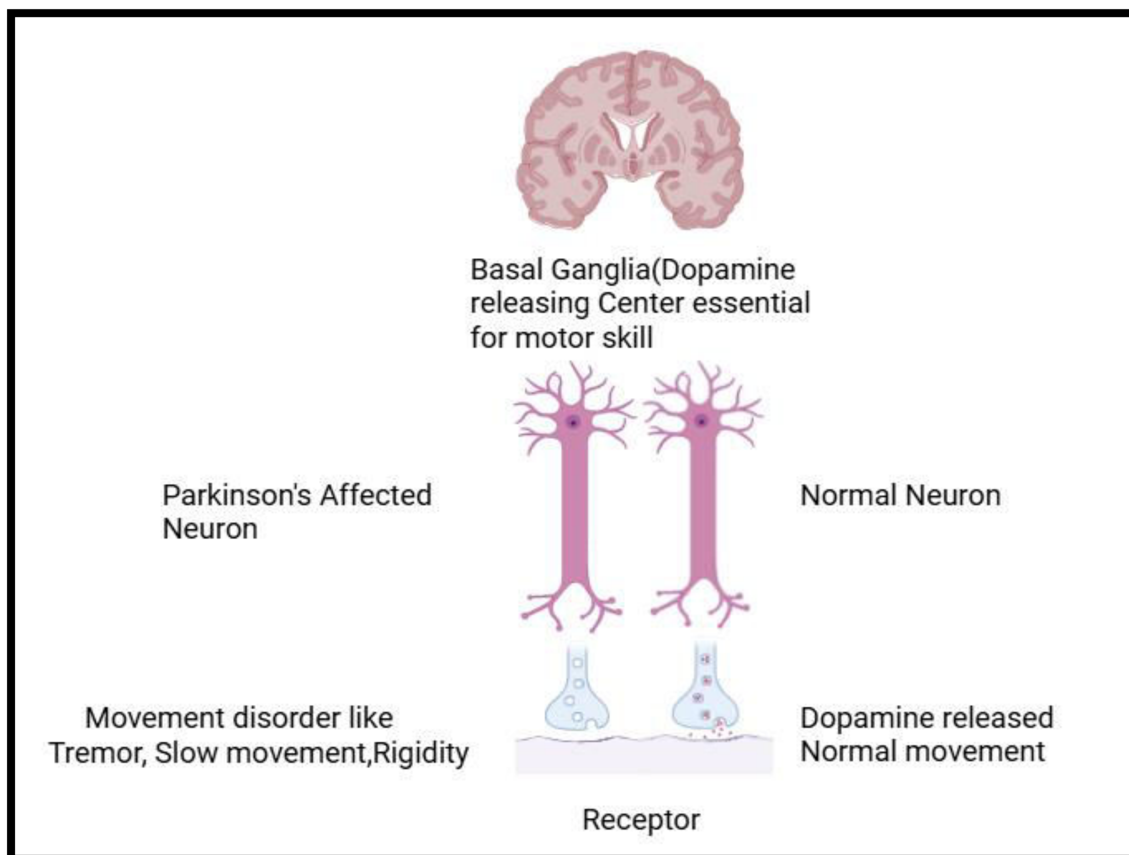
S.no	Drug name	Botanical name	Family	Part used	Doses
1	**Tukhm e Konch**	Mucuna prurience	Fabaceae	Seed	5gm
2	**Aqarqarha**	Anacyclus pyrethrum (L.) Lag.	Asteraceae	Root	5gm
3	**Waj**	Acorus calamus L.	Acoraceae	Root	5gm
4	**Asgand**	Withania somnifera	Solanaceae	Root	5gm
5	**Ajwain khurasani**	Hyoscyamus Niger Linn	Solanaceae	Seed	5gm

Patients	UPDRS before treatment	UPDRS after treatment	Percentage Changes	Result
Case 1	144	120	16.7	t=6.3
Case 2	157	123	21.7	p<0.001
Case 3	160	118	26.3	

Table 2. Therapeutic Impact on UPDRS Scores in PD Patients: Pre- and Post-Treatment Comparison

Fig. 1 Therapeutic Impact on UPDRS Scores in PD Patients: Pre- and Post-Treatment Comparison





Graphical abstract