



Role of *Mucuna pruriens* beej Churna and *Mucuna pruriens* beej siddha matra basti in the administration of *Kampavata* with Reference of Parkinson's Disease

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ABSTRACT:

The traditional sign & symptoms of *Kampavata* resembles with modern day's Parkinson's disease. *kampavata* is the one of Namatamja vata vikara explained in texts of Ayurvedic samhitas. Parkinson's disease is a degenerative disorder of central nervous system and is having pathology in substantia nigra & is extra-pyramidal crippling disease. Parkinson's disease affects 1% of population above the age of 50 years. The symptoms of *kampavata* are hasta-padyo kampa(tremors in hands and legs), stambha(rigidity), chests sanghat(Bradikinesia and akinesia) vakvikruti(disturbance in speech) and gatra sanghat(postural abnormality). In spite of advancement in the field of modern medical science the treatment of this disease remains symptomatic only and no complete cure is available till date. The motor features of Parkinson's disease can be managed with treatment that replaced the chemical dopamine in the brain. While there is many medically approved dopamine replacement drugs available for patients affected by Parkinson's disease there also many natural sources. The previous research on *mucuna pruriens* are supported as one of the most potent natural source of dopamine replacement treatment.

KEYWORDS: *kampavata*, *Mucuna pruriens* beej, *Mucuna pruriens* beej matra basti , parkinson's disease

INTRODUCTION

According to Ayurveda, most of the diseases of the Vata are requirements situation of degenerative diseases of the nervous system. Kampa vata is one such condition caused by imbalance of Vata. The treatment of 'kampavata' consists of both internal and external administration of drugs in different forms aimed to reverse the 'vata' imbalance. Ayurveda was found to be an effective treatment for patients with Parkinson's disease. Ayurveda is an ancient Indian system of medicine. It has an integrated approach to the prevention and treatment of illness and tries to maintain or re-establish the harmony between the mind, body, and forces of nature. Kampavata is a dhatushayaj & apatarpanjanya vikara of vata vitiation, In Ayurveda Basti is the main treatment modality used for vata vikara, hence application of kapikachhu beej siddha matra basti with oral administration of the kapikachhu beej churna (Mucuna pruriens seed powder) shows magical result in the patient in two months of treatment.

In Parkinson's disease the basic pathologic changes is degeneration of a group of nerve cells deep within the centre of brain in an area called substantia nigra. These cells use Dopamine as their neurotransmitter to signal other nerve cells. As these cells degenerate & stop functioning, Dopamine fails to reach the areas of brain that affect motor functions. No satisfactory treatment is seen in modern system of medicine for Parkinson's disease. In this therapy kapikachhu beej contains Levodopa which is indicated in Parkinson's disease and Basti chikitsa is useful in all Vata vyadhis & Nasya affects the group of degenerated nerve cells of substantia nigra.

ABOUT AYURVEDA TRADITIONAL SYSTEM

A fine powder of drug or drugs in Ayurvedic systems of medicine known as churna. The drugs mentioned in patha are cleaned properly dried thoroughly pulverized and then sieved. The churns have property of free flowing and it retains its potency for one year if preserved in an airtight container. Triphala churna, trikatu churna are some of examples. Ayurveda, a natural system originated in India more than 3,000 years ago. The term ayurveda is derived from the Sanskrit words ayur (life) and veda (science or knowledge) thus, Ayurveda translates to knowledge of life.

Churna is a mixture of powdered herbs and or minerals used in Ayurvedic medicine. Triphala is an example of a classic Ayurvedic formula used for thousand of years that is made from the powders of three fruits. Churna means dried powder. Raw herbs are dried, powdered and pass through sieves to obtain a fine powder which is mixed with other ingredients to prepare the churna

AYURVEDA

The term ayurveda is the traditional Hindu system of medicine that uses a combination of diet, herbal treatments and yogic breathing to treat illness.

Ayurveda also called as ayurveda medicine.

Ayurveda also called the science of longevity, because it offers a complete system to live a long healthy life.

It offers programs to rejuvenate the body through diet and nutrition.

Ayurvedic medicine is a healthy lifestyle system that people in India have used for more than 5000 years.

In Ayurveda PARKINSON'S DISEASE is described as kampavata which occurs due to exaggeration of VATA & DOSHA. The traditional use of medicinal plants as natural remedies against various pathologies has received full attention from the scientific community. In the last few decades, herbal medicines have been extensively used to fight diseases worldwide due to their efficiency, low costs, and few side effects. Plants contain an immense variety of bioactive molecules for therapeutic, agri-food, and cosmetic uses. For many years, medicinal plants have been considered a promising source of essential raw material for the discovery of natural compounds that are used as subsequent drugs to fight ailments.

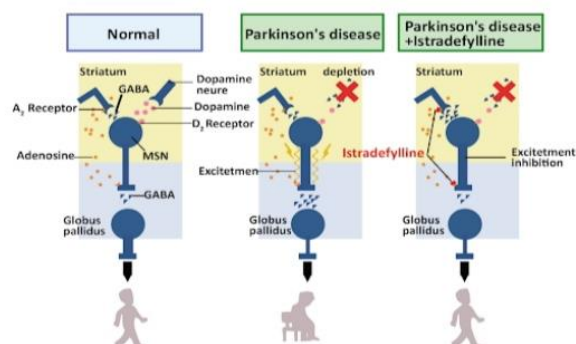
The seed powder of the leguminous plant, *Mucuna pruriens* has long been used in traditional Ayurvedic Indian medicine for diseases including parkinsonism. We have assessed the clinical effects and levodopa (L-dopa) pharmacokinetics following two different doses of mucuna preparation and compared them with standard L-dopa/carbidopa (LD/CD)

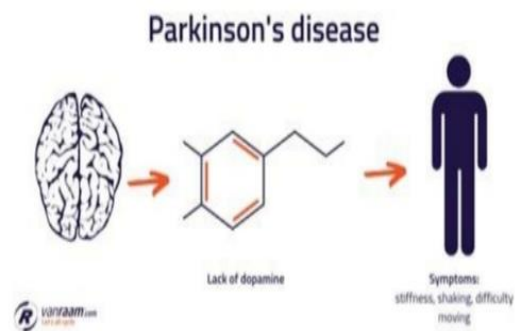
PARKINSON'S DISEASE:

Loss of dopamine-generating cells in the brain that results in a complex array of symptoms is called as Parkinson's disease (PD) but it is primarily associated with progressive loss of motor control. Major cause of disability among the elderly is Parkinson's disease. After Alzheimer's. Common diagnostic criteria generally require the initiation of antiparkinson's medication before the diagnosis can be confirmed. This ambiguity can be confusing for primary care physicians, disease, currently the second most common neurological degenerative disorder affecting worldwide is Parkinson's disease. Young-onset Parkinson's disease is a condition where an individual under 40 years of age may develop PD

Motor function in PD

Parkinson's Disease is a progressive neurodegenerative disorder with motor defects due to imbalance between the dopaminergic (inhibitory D2 excitatory D1 receptor). A disorder of central nervous system that affects movement often including tremors. Nerve cell damage in the brain causes dopamine levels to drop leading to symptoms of Parkinson's disease. A disorder of the central nervous system that affects movement often including tremors. Nerve cell damage in the brain causes dopamine level to drop, leading to the symptoms of Parkinson's disease. In Parkinson's disease, certain nerve cells (neurons) in the brain gradually break down or die. Many of the symptoms are due to a loss of neurons that produce a chemical messenger in your brain called dopamine. When dopamine levels decrease, it causes abnormal brain activity, leading to impaired movement and other symptoms of Parkinson's disease.





SYMPTOMS OF PARKINSON'S DISEASE

1. Tremor: can occur at rest, in the hands, limbs, or can be postural

2. Muscular: stiff muscles, difficulty standing, difficulty walking, difficulty with bodily movements, involuntary movements, muscle rigidity, problems with coordination, rhythmic muscle contractions, slow bodily movement, or slow shuffling gait

3. Sleep: early awakening, nightmares, restless sleep, or sleep disturbances

4. Whole body: fatigue, dizziness, poor balance, or restlessness

5. Cognitive: amnesia, confusion in the evening hours, dementia, or difficulty thinking and understanding

6. Speech: difficulty speaking, soft speech, or voice box spasms

7. Nasal: distorted sense of smell or loss of smell

8. Urinary: dribbling of urine or leaking of urine

9. Mood: anxiety or apathy

10. Facial: jaw stiffness or reduced facial expression



OBJECTIVES.

1. Slowed movement

2. Balance

3. Gait and Balance problems

PHYSICOCHEMICAL PROPERTIES

KAPIKACCHU=

Kapikacchu has scientific name *mucuna pruriens*(L)DC.It's English common names include monkey tamarind,velvet bean,Bengal velvet bean,Lucinda bean and Lyon bean.It produced many medium sized red swollen bumps along with itching.*Mucuna pruriens* has a natural herbal supplement used in Ayurvedic medicine an ancient practice from India that lowers stress, reduces anxiety impress focus.It has agricultural and historical value and used in herbalism.It has family fabaceae.*Mucuna* has a smoky,earthy flavour.*Mucuna pruriens* or velvet beans is a tropical legume that might boost dopamine levels *Mucuna pruriens* has an established herbal drug used for the management of nervous disorders and also as an aphrodisiac.It has been shown that its seeds are potentially of substantial medicinal importance. It has been shown to have antiparkinson and neuroprotective effect.It is very rich in natural levodopa which is better tolerated and more potent than synthetic levodopa in simmer, madoka, or stalevo.

IMPORTANCE

- 1.*Kapikacchu* used for centuries as a household remedy to treat neurodegenerative disorder.
- 2.It can raise dopamine level and naturally evaluate your mood levels.
- 3.It maintain tridoshic balance by reducing vata,while increasing pitta and kapha doshas.
- 4.It contains L-dopa gallic acid glycosides,nicotinic tannic acid.
- 5.*Kapikacchu* silage contains 11-23% crude proteins,35-40% Crude Fibres and dried beans,30-35% crude proteins.
- 6.They may come from any part of plant like seeds in order to ensure quality,quantity,purity and efficacy of drug.

KAPIKACCHU SEED

*SCIENTIFIC CLASSIFICATION

- 1.Botanical name- *Mucuna pruriens*
- 2.Kingdom- *Plantae*
- 3.Family- *Fabaceae*
- 4.Genus- *Mucuna*
- 5.Species- *Mucuna pruriens*.

Seeds of *mucuna pruriens* are known to produce the unusual nonprotein amino acid 3-(3,4 dihydroxyphenyl)-L-alanine(L-dopa).It also contains glutathione,gallic acid and betasitosterol.It has unidentified bases like mucunine,mucuna and dine,prurienine other bases isolated from the pods,seeds,leaves and roots include indole 3-alkylamines- N , N dimethyltryptamine.

In Ayurvedic medicine this magical bean has been used for thousands of years.It is also known to be velvet beans.Velvet beans naturally contain high level of L-Dopa the precursor molecule to

dopamine. The seed powder of luminous plant *Mucuna pruriens* has long been used in traditional Ayurvedic Indian medicine for diseases including Parkinsonism.

The two types of *kapikacchu* are described as wild and cultivated.

-wild variety has better utility in clinical practice than cultivated.

-According to seed colour, two types are explained by some authors as sveta bija (White seed) and krishnabeeja (Black seed)

IMPORTANCE OF KAPIKACCHU SEEDS

1. Neurodegenerative disorder
2. Raise dopamine level and naturally elevate your mood levels.
3. Maintain tridoshic balance, by reducing vata while increasing pitta and kapha



KAPIKACCHU LEAVES:

Mucuna pruriens has a semi woody annual or more often perennial twinner producing from its perenniating root system with slender

terate branches that when young are usually clothed with short whitish hair but becomes fluorescent or only slightly hairy when mature.

Leaves are fairly large, pinnately trifoliate, alternate about 1/5 inches long. Leaflets are 3 to 4 inches long. Leaves covered with fine lustrous or silvery grey hair beneath.

.It is a powerful herb that balances the three doshas-vata, pitta, kapha, kaunch been or kapikacchu eliminates a host of health issues troubling the nasal passage, throat and lungs, such as cough, wheezing, cold, allergies and frequent sneezing. The seeds contain high amounts of L-DOPA that is used in the treatment of Parkinson's disease. It also contains lecithin, a glucoside and a number of alkaloids including nicotine, prurienine, pruriedine, the seed kernel contain fatty oil.

Morphological characteristics

1. The plant is an annual, climbing shrub with long vines that can reach over 15 meters in length
2. The plant is young, it is almost completely covered with fuzzy hairs, shed with age.
3. The leaves are tri-pinnate, ovate, or rhomboid shaped. In young plants, both sides of the leaves are hairy.

KAPIKACCHU FLOWERS:

The flowers are arranged in axillary arrayed panicles, 15 to 32 cm long and each have two to many flowers. The accompanying leaves are about 12.5 cm long. The vines come into flowering after 120-125 days of sowing and continue to bear flowers and fruits till 180-200 days. *Mucuna pruriens* bears white, lavender or purple flowers. Its pods

are about 10-20 cm long and are covered with loose white to creamish hairs that cause a severe itching if they come in contact with skin. The chemical compounds responsible for the itch are a protein, mucunain and serotonin. The seeds are shiny black brown or spotted in white

Antimicrobial Activity: The methanolic extract of whole plant had antimicrobial properties against gram +ve and gram -ve organism. This extract is mainly effective against *Escherichia coli*, *Salmonella typhi*, *Bacillus subtilis* and *Shigella dysenteriae*. The antimicrobial potency was evaluated by zone of inhibition (ZI) where *Escherichia coli* showed higher ZI (2.8cm) than *Bacillus subtilis* ZI (2.1cm).

Antioxidant Activity:

The various parts of this plant contain total phenols which might have antioxidant activity. The similar findings were observed for this plant where free radical scavenging activity was evaluated via nitric oxide scavenging method. The alcohol extract showed significant antioxidant activity which was comparable with standard ascorbate and total phenol content.

Anti Parkinson's Activity:

Its seeds contain levodopa, a direct precursor of the neurotransmitter dopamine; it has shown to be as effective as pure levodopa /carbidopa in the treatment of Parkinson's disease.

**Antidiabetic Activity:**

The presence of these cyclitols is of interest due to the insulin-mimetic effect of d-chiro-inositol, which constitutes a novel signaling system for the control of glucose metabolism. *M. pruriens* seeds are used at a dose of 500 mg/kg to reduce plasma glucose level. These and other data demonstrated that the amount of seeds necessary to obtain a significant antidiabetic effect contain a total of approximately 7 mg of d-chiro-inositol. The antidiabetic properties of *M. pruriens* seed ethanol/water 1:1 extract are most likely due to d-chiro-inositol and its galacto derivatives. The seed extract of *M. pruriens* at doses of 100 and 200 mg/kg body weight reduced oral glucose load from ~127 to 75 mg % after 2 h of oral administration. In another experiment, there was reduction of blood glucose from ~250 to 90 mg % in streptozotocin diabetic rats after 21 days. The investigation suggested that the antidiabetic activity may be due to its dietary fiber content.

Neuro-protective Activity:

Reports suggested that the seed powders of *Mucuna pruriens* are more beneficial to Parkinson's patients than the synthetic drug, when it is used for long term. An n-propanol extract of *M. pruriens* seeds yields the highest response in neuro-protective testing involving the growth and survival of DA neurons in culture. Interestingly, n-propanol extracts, which contain a negligible amount of L-DOPA, have shown significant neuro-protective activity, suggesting that a whole extract of *M. pruriens* seeds could be superior to pure L-DOPA with regard to the treatment of Parkinsonism. The dopamine content in brain tissue is reduced when the conversion of tyrosine to L-DOPA is blocked. L-DOPA, the precursor of dopamine, can cross the blood-brain barrier and undergo conversion to dopamine, restoring neurotransmission.

Pharmacognostical studies

a) Macroscopic:

Seed ovoid, slightly laterally compressed, with a persistent oblong, funicular hilum, dark brown with spots; usually 1.2-1.8cm long, 0.8-1.2 cm wide, hard, smooth to touch, not easily breakable; odour, not distinct; taste, sweetish-bitter.

b) Microscopic:

Mature seed shows a thin seed-coat and two hard cotyledons; outer testa consists of single layered palisade-like cells; inner testa composed of 2 or 3 layers, outer layer of tangentially elongated, ovoid, thin-walled cells, inner 1 or 2 layers of dumb-bell or beaker-shaped, thick-walled cells; tegmen composed of a wide zone of oval to elliptical, somewhat compressed, thin-walled, parenchymatous cells; some cells contain starch grains; cotyledons poised of polygonal, angular, thin-walled, compactly arranged, parenchymatous cells, containing aleurone and starch grains; starch grains small, simple, rounded to oval measuring 6-41 μ in dia., but not over 45 μ in dia.; a few vascular bundles with vessels showing reticulate thickening or pitted present.

POWDER - Pale cream coloured; shows fragments of testa with palisade-like cells thin walled parenchyma, reticulate and pitted vessels, aleurone and starch grains small, simple, rounded to oval measuring 6-41 μ in dia., but not over 45 μ . in dia

MATERIAL & METHOD:

17 patients diagnosed clinically with Parkinson's disease was selected in this study. This study is open ended, prospective clinical study. Improvement in the symptoms is assessed clinically by Unified Parkinson's Disease Rating Scale (UPDRS) before initiating treatment, during treatment (at the 1st month) and at the end of study.

INCLUSION CRITERIA:-

- A patient clinically presenting the symptoms of Parkinson's disease).
- Patients of either sex.
- Both newly diagnosed & those who are under treatment for the same are included in this study.

EXCLUSION CRITERIA:-

- Patients with other Systemic Disorders & those who are with other complications which interfere with treatment was excluded.
- The patients suffering from , Diabetes, Uncontrolled Hypertension, other metabolic, other metabolic & endocrine diseases was excluded.

DIAGNOSTIC CRITERIA:-

The diagnosis was made base on the clinical symptoms of Kampavata, which are as below,

- Kampa: - tremor's
- Stambha: - rigidity
- Chesta sanghat: –Bradikinesia
- Gati Sanghat:- gait abnormalities
- Avanamana:- Postural abnormality
- vak vikruti: - abnormality in speech

DRUG USED:-

Kapikacchu beej churna (mucuna pruriens seed powder: 5 gms thrice daily, with kosha jal anupana. Kapikachhu beej siddha matra basti in 70 ml quantity is administered in morning when bowel and bladder is evacuated. Matra basti is prepared by boiling 70 ml of til talam + kapikacchu kwatha.)

ASSESSMENT CRITERIA:-

To assess the efficacy of treatment the symptoms of Kampavata (Parkinson's disease) as tremors, rigidity, bradykinesia, gait & postural abnormalities etc. were noted carefully before the commencement of treatment, on 30th day & at the end of 2nd month i.e. at the end of treatment. The Unified Parkinson's Disease Rating Scale (UPDRS) was applied to measure the degree of improvement.

The gradation of symptom is done as per follows

Tremors(Table 1,gradation of Symptoms)

0	Absent
1	Slight & infrequent not bothersome to patient
2	Moderate bothersome to patient
3	Severe, interfere with many activities
4	Marked interfere with all activities

Rigidity (Table 2, gradation of symptom)

0	Absent
1	Slight or only with activities
2	Mild to moderate with activities
3	Marked, full range of activities
4	Severe

• **Bradikinesia:(Table 3, gradation of symptom)**

0	None
1	Minimal slowness
2	Mild slowness, small amplitude
3	Moderate slowness & amplitude
4	Severe slowness & amplitude

Gait : (Table 4, gradation of symptom)

0	Normal
1	Walks slowly shuffle with short step
2	Walks with difficulty, little or no assistance
3	Sever disturbance frequent assistance
4	Cannot walk

• **Posture: (Table 5, gradation of symptom)**

0	Normal
1	Slightly stooped
2	Moderately stooped may lean on one side
3	Severe stooped with kyphosis
4	Marked abnormality of posture

STATISTICAL ANALYSIS: -

The data regarding symptoms of samples were collected and graded according to unified Parkinson's disease rating scale, the total score before treatment, during & after completion of treatment was assessed by using "Chi- Square Test".

OBSERVATION OF KAMPA(TREMOR),STAMBHA(RIGIDITY),CHESTA–SANGHAT(BRADIKINESIA), GATI - SANGHAT (GAIT ABNORMALITY), AVNAMANA (POSTURAL ABNORMALITY)(TABLE NO.6)

Tremor	0	1	2	3	4	Total
Before Treatment	-	-	10	6	1	17
During Treatment	-	-	9	6	1	17
After Treatment	-	10	4	2	1	17
					P value<	0.001
Rigidity	0	1	2	3	4	Total
Before Treatment	1	7	5	3	-	17
During Treatment	9	5	2	1	-	17
After Treatment	12	3	2	-	-	17
					P value<	0.030
Bradikinesia	0	1	2	3	4	Total
Before Treatment	-	2	10	3	2	17
During Treatment	-	6	6	3	2	17
After Treatment	2	10	3	2	-	17
					P value<	0.050
GAIT Abnormality	0	1	2	3	4	Total
Before Treatment	-	9	6	2	-	17
During Treatment	-	10	6	1	-	17
After Treatment	-	1	14	11	-	17
					P value<	0.267
Postural Abnormality	0	1	2	3	4	Total
Before Treatment	1	10	6	-	-	17
During Treatment	1	10	6	-	-	17
After Treatment	1	10	6	-	-	17

					P value<	1.000
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OBSERVATION OF KAMPA(TREMOR), STAMBHA (RIGIDITY), CHESTA–SANGHAT (BRADIKINESIA), GATI -SANGHAT(GAIT ABNORMALITY), AVNAMANA (POSTURAL ABNORMALITY) (Table-7)

CHRONICITY	No.Of.Patients
LESS THAN 1 YEAR	3
1-2 YEARS	8
2-3 YEARS	3
3-4 YEARS	2
4-5 YEARS	1
TOTAL	17

DRUG OF ACTION OF KAPIKACHHU BEEJ

(MUCUNA PRURIENS):-Mucuna pruriens seeds has been reported to be a good source of 3, 4-dihydroxyphenylalanine (L-Dopa) with 5-6%. The alcohol extract of mucuna pruriens seeds have four alkaloids viz mucinine, mucinadine, prurienine, prurieninine. The seed extract show potent antiparkinson effect in mice . The past researches are supporting one of the most potent natural sources for dopamine replacement treatment

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