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ORIGINAL RESEARCH ARTICLE

CLINICAL EVALUATION OF RAJAYAPANA BASTI ADMINISTERED BY CLASSICAL PUTAKA METHOD AND DRIP METHOD IN PARKINSON'S DISEASE

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ABSTRACT:

Parkinson's disease (PD) has been described as *Kampavata* in Ayurveda. Ayurvedic texts have described treatment regimens to combat the condition. **Aim:** To determine the improvement in patients suffering from PD following *Basti* treatment. **Materials & Methods:** We gave *MustadiRajayapanaBasti* treatment in patients willing to undergo *Basti* treatment by two methods- Classical *Putaka* method and Drip method. Results were analyzed using paired samples 't' test. **Results:** All patients tolerated the treatment well without any adverse events and reported improvement in symptoms. Although both methods show improvement, there was a statistically significant improvement in the tremors, rigidity, akinesia and bradykinesia, pill rolling movement, micrographia and glabellar tap. **Conclusions:** Over the short period of the present study, *Basti* therapy especially given by Drip method was found to show improvement in the condition of patients with PD.

Keywords: *Kampavata* , *MustadiRajyapanaBasti*, Parkinson's disease

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INTRODUCTION:

Parkinson's disease is a progressive neurodegenerative disorder affecting seven to ten million people worldwide[1]. The clinical course of the disease is chronic, progressive and characterized by rigidity, bradykinesia and tremors[2]. The treatment option mainly involves dopamine replacement which has its own side effects in long run. The term *Kampavata* was explained for the first time in the text *Basavarajeeyam*[3], with most of its clinical features similar to that of PD.

- *Karapadatale kampa* – Tremors in the hands and feet.
- *Dehabhramana* – Postural instability.
- *Nidrabhanga* – sleep disturbances
- *Matiksheena* – Dementia

As *Kampavata* occurs due to the derangement of *vata* and also its prevalence is more in old age - it is clear that the therapy should be aimed at these three levels.

- Pacifying the vitiated *vata*
- Providing neuro-nourishment by *Rasayana* drugs

To obtain satisfactory results, the management should be in such a way that it should bridle the aggravated *Vata* , *Dhatukshaya*, *Avarana*. This goal can be achieved by the use of *Rasayana* drugs in *Basti* form. *Basti* has been considered as the best treatment for *Vata*[4]. Moreover, *Basti* also promotes the longevity and provides stability to *Dhatus*. It enhances the strength ofpsyche, Agni, voice and complexion[5]. *Mustadi Rajayapana* has said to be *Rasayana*, *Balya* and *Brimhana* by *Maharshi Charaka*[6].

Classically *Basti* is given by *Putak* method i.e through *Basti* bag and nozzle in which the drug is administered at once.However in this study we have used yet anothermethod, that is, drip method first described by Vaidya H.S.Kasture in which the drug is administered per rectum through drip which takes longer duration to administer as well as retention[7]. The aim of this study is to assess and compare the efficacy of *Rajyapana Basti* given by classical and drip method in the management of *Kampavata* w.s.r. PD.

MATERIALS AND METHODS:

Research design: Interventional, randomised open clinical trial.

Materials:

Rajayapana Basti:

Preparation of *Rajayapana Basti* [6]: In this study, for the preparation of *Rajayapana Basti*, coarse mixture of *Mustadi* drug was taken in amount of 12 *Tolas* (120 g). Decoction was prepared by the regular method and was

filtered. Milk 430 ml was added to the decoction and was boiled until the quantity of milk is remained. Mutton soup 60 ml was then added to it. In a mortar rock salt 5 g was triturated with 60 g honey with the help of pestle. Cow's Ghee 60 g was added to it and was triturated until it became like amalgam. Then powder of *Kalka* drug in a quantity of 30 g was mixed with it. Lastly the milk decoction mixed with mutton soup was added to it and stirred well. Thus, the net quantity of *Basti* prepared for administration was 640 ml.

Sampling: Simple random sampling technique using random table number.

Study Population: An accessible population of male and female who were representative of target population participated in the study.

Study Sample and Sample size: A total of 13 patients irrespective of their sex, caste, etc. having clinical signs and symptoms of PD were selected taking due considerations of inclusion and exclusion criteria.

Study setting: The study was carried out in Department of Panchakarma, Institute for Post Graduate Teaching and Research in Ayurveda Hospital, Jamnagar, Gujarat, India, from 2005 to 2007.

Inclusion Criteria: For inclusion in this study, patients with PD in the age group of 40-70 years, who had following symptoms of PD and were willing to consider *Ayurvedic* treatment, were recruited.

- Akinesia and bradykinesia(*Chestasanga*) : Slowness of movements.
- Resting tremor(Kampa): At least in one limb.
- Rigidity(Stambha): In any group of muscles in extremities.
- Postural changes(Avanamana): Which includes signs like Rombergism.
- Gait changes:Slow, shuffling and short stepped gait (Marché apetits pas)
- Difficulty in speech-Monotonous and low speech(*Vak Vikriti*).

Exclusion Criteria: Patients with marked mental impairment, hypothyroidism, pregnancy and postpartum period, renal, hepatic, and significant cardiac dysfunctions were excluded from the study. Thirteen patients fulfilled the above inclusion and exclusion criteria and were recruited in the study. A detailed neurological examination of all the patients was performed.

Grouping: Patients were admitted in IPD of IPGT&RA, Jamnagar for a period of 21days and *Ayurvedic* treatment was administered, which consisted of the following:

Group A

- *Abhyanga* (methodical massage) [8] of the entire body was performed with *Dhanvantaram tailam* .
- *Bashpa Svedana*(sudation) was done. The patient was made to sit in a customized wooden box [8] into which warm vapours were passed. This induced perspiration in the patient. This was continued for 10-15 minutes depending on the patient's tolerance level.
- *Mustadi Rajyapana Basti*- By classical *putak* method. Dose-500ml

Group B

- *Abhyanga*(massage)
- *Svedana*(sudation)
- Mustadi Rajyapana Basti- By drip method. Dose-500ml

Method of Administration of Yapana *Basti* [7,9]: After passing the stool and urine the patients were subjected to massage with Bala Taila and fomentation. Patients then were given left lateral position with their left leg held out stretched while the right leg flexed at knee and held near abdomen. Movements at the time of *Basti* were prohibited. Simple rubber catheter no. 12 was used for administration of *Basti* in Drip method, and *Basti Netra* for *Putaka* method was used and they were lubricated with *Ghee* or oil. A special Douch set with a controller was used for Drip method while classical *Basti Netra* attached with polythene bag was used for *Putaka* method. For the drip method after filling with required quantity of liquid, the set was held at a higher level, so that the rubber catheter attached to it can be introduced into anus steadily and slowly. To avoid any sedimentation and blockage, *Basti* drug was stirred gently time to time. Catheter was removed after administration of *Basti* and patients were advised to relax in supine position. While for *Putaka* method *Basti Netra* was attached with polythene bags after filling them with required liquid and pushed gently into anus. Then gentle pats were given on the soles and buttocks of the patients. After sometime, patients were advised to take rest in their bed.

Criteria for assessment: For the assessment, a scoring pattern was adopted which is as follows:

Tremor

T4-Bilateral violent tremor along with tremor in tongue and/or in eyelids lips and not suppressed or diminished by willed movement.

T3-Tremor not violent but present in less number of organs mentioned above.

T2-Bilateral tremor.

T1-Unilateral slight tremor present at rest decreased by action, increases by emotion and stress and disappears during night

T0-No tremor.

Bradykinesia:

B4- Marked slowness, poverty or amplitude

B3- Moderate slowness, poverty or small amplitude

B2- Mild slowness and poverty of movement

B1- Minimal slowness could be normal or deliberate

B0- None

Gait :

G4-Unable to raise from bed and walk without assistance.

G3-Can walk slowly but need substantially help, shuffling with retropulsion/ propulsion lack of associated movement.

G2-Can walk without assistance slowly with shuffling with retropulsion/ propulsion.

G1-Can walk without assistance slowly but with shuffling gait.

G0-Can walk brisk without aid.

Speech changes:

V4- Incomprehensive words, monotonous voice, echoing, speaks only on insistence of examiner.

V3- Monotonous voice, spilt consonance but understandable.

V2- No echoing dysarthria present but speech is clearly understandable, monotony present.

V1- Variable tone of voice, slight slurring of speech.

V0- Normal speech.

Rigidity:

R4-Marked rigidity in major joints of limbs, patients maintain abnormal sitting postures, stared eyes.

R3-Patients sit properly but Cog-wheel rigidity demonstrable in major joints, slow eye ball movements without staring appearance.

R2- Rigidity in one of the major joints.

R1-Cog-wheel rigidity feebly present and on continuous examination vanishes.

R0- No rigidity.

Statistical Analysis: Results were analyzed using paired samples '*t* ' test.

OBSERVATIONS:

There were one woman and twelve men who participated in the study.69% patients were in the age group of 61-70 years.54% patients had *Vata –Pitta* constitution. Chief complaints presented by the patients are enlisted in Table 1.

Table 1: Cardinal symptom wise distribution of 13 patients of *Kampavata* (Parkinson's Disease)

CHIEF COMPLAINTS	GROUP A	GROUP B	TOTAL	%
Resting tremor	6	7	13	100
Akinesia and bradykinesia	5	7	12	92.3
Rigidity	5	6	11	84.6
Gait changes	4	6	10	71
Difficulty in speech	4	4	8	61.5
Memory Loss	5	3	8	61.5
Pill rolling	5	4	9	69.2
Micrographia	5	5	10	71
Glabellar tap	3	6	9	69.2

Effect of *Rajayapana Basti* given by *Putaka* method: *Basti* given by *Putaka* method provided statistically highly significant relief in Rigidity *(Stambha)* (38.46%) and gait changes *(Gativikriti)* (38.16%). This therapy provided statistically significant improvement in pill rolling movements (27.27%) and glaballar tap (36.36%). It also provided statistically highly significant improvement in signs of picking of pins (45.45%) and significant relief in marie sign (30.00%), rapid alternating movement (33.33%) and walking time (25.00%). Table2-4

Table 2: Effect of Rajyapana Basti on Cardinal Symptoms by Putaka Method

Symptoms	Mean		%	S.D.	S.E.	't'	P
	B.T.	A.T.					
Tremors	03.00	02.66	11.11	0.51	0.21	1.58	> 0.01

Rigidity	02.16	01.33	38.46	0.40	0.16	5.00	<0.001
Gait Changes	02.00	1.16	41.16	0.40	0.16	5.00	<0.001
Speech Changes	02.00	1.66	16.66	0.51	0.21	1.58	>0.01
Pill rolling movements	1.83	1.33	27.27	0.54	0.22	2.23	<0.05
Micrographia	1.16	1.00	14.28	0.40	0.16	1.00	>0.10
Glabellar Tap	1.83	1.16	36.36	0.51	0.21	3.16	<0.01

Table 3: Effect of Rajyapana Basti by Putaka Method on Indices to assess Akinesia and Bradykinesia

Symptoms	**Mean**		**%**	**S.D.**	**S.E.**	**'t'**	**P**
	B.T.	**A.T.**					
Picking of pins	1.83	1.00	45.45	0.40	0.16	5.00	<0.001
Marie Sign	1.66	1.16	30.00	0.54	0.22	2.23	<0.05
Buttoning Time	1.66	1.50	10.00	0.40	0.16	1.00	>0.10
RAM	1.50	1.00	33.33	0.54	0.22	2.23	<0.05
Chest Expansion	1.16	1.00	14.28	0.40	0.16	1.00	>0.10
Walking Time	2.00	1.50	25.00	0.54	0.22	2.23	<0.05

Table 4: Effect of Rajyapana Basti by Putaka Method on Functional Assessment Test

Symptoms	**Mean**	**%**	**S.D.**	**S.E.**	**'t'**	**P**

	B.T.	A.T.					
Handgrip	1.50	1.16	22.22	0.81	0.33	1.00	> 0.10
Foot Pressure	1.50	1.60	22.20	1.26	0.51	1.00	> 0.10

Effect of *Rajayapana Basti* given by Drip method: Group A provided statistically significant relief in tremors *(Kampa)*(41.17%), Rigidity *(Stambha)* (46.15%), gait changes *(Gativikriti)* (60%), speech changes *(Vakvikriti)* (50%).It also provided statistically significant relief in the signs of diseaselike pill rolling movement (44.44%), micrographia (57.14%) andglabellar tap (50.00%).

This therapy also provided statistically significant improvement inclinical tests like picking of pins (54.54%), marie sign (62.50%),buttoning time (37.50%), rapid alternating movement (50.00%) andwalking time (54.54%).It also provided statistically significant improvement in functionalassessment tests like handgrip (44.44%) and foot pressure (55.55%).Table 5-7

Table 5: Effect of Rajyapana Basti on Clinical Features by Drip Method

Symptoms	Mean		%	S.D.	S.E.	't'	P
	B.T.	A.T.					
Tremors	02.83	01.66	41.17	0.75	0.30	3.79	<0.01
Rigidity	02.16	01.16	46.15	0.63	0.28	3.53	<0.01
Gait Changes	01.66	00.66	60.00	0.63	0.25	3.87	<0.01
Speech Changes	02.00	01.00	50.00	0.63	0.25	3.87	<0.01
Pill rolling movements	1.50	0.83	44.44	0.50	0.25	2.58	<0.01
Micrographia	1.16	0.50	57.14	0.51	0.21	3.16	<0.01
Glabellar Tap	1.33	0.66	50.00	0.51	0.23	2.88	<0.01

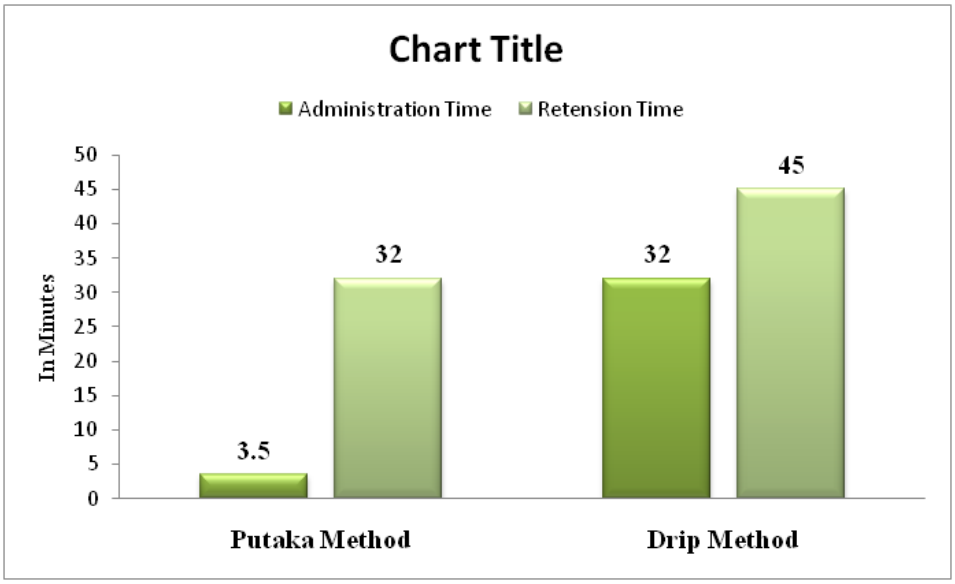
Table 6: Effect of Rajyapana Basti by Drip Method on Indices to assess Akinesia and Bradykinesia

Symptoms	Mean		%	S.D.	S.E.	't'	P
	B.T.	A.T.					
Picking of pins	1.33	0.83	54.54	0.81	0.33	4.00	<0.01
Marie Sign	1.33	0.50	62.50	0.40	0.16	5.00	<0.001
Buttoning Time	1.33	0.83	54.54	0.54	0.22	2.23	<0.05
RAM	01.00	0.50	50.00	0.54	0.22	2.23	<0.05
Chest Expansion	1.16	1.00	14.28	0.40	0.16	1.00	>0.10
Walking Time	1.83	0.83	54.54	0.40	0.16	7.00	<0.001

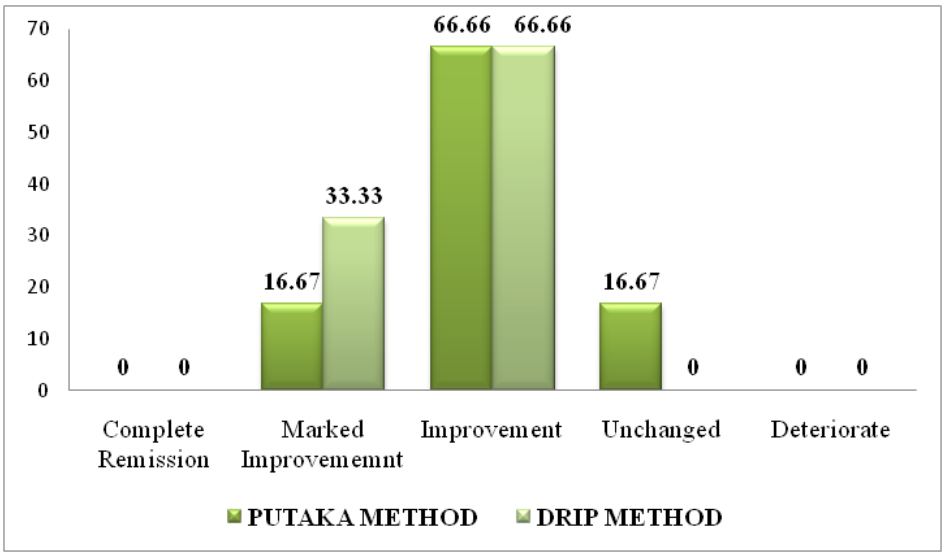
Table 7: Effect of Rajyapana Basti by Drip Method on Functional Assessment Test

Symptoms	Mean		%	S.D.	S.E.	't'	P
	B.T.	A.T.					
Handgrip	1.50	0.83	44.44	0.51	0.21	3.16	<0.01
Foot Pressure	1.50	0.66	55.00	0.40	0.16	5.00	<0.001

Graph 1: Time of Administration and retention of basti:



Graph 2: Overall Effect of Therapy:



DISCUSSION:

Vata is responsible for all types of body movements and is crucial in the pathogenesis of a large number of diseases[10]. In most of the neurodegenerative disorders *Vata* dominant symptoms are appreciable due to vitiation of *vata* either due to-1) *Dhatuksaya* (tissue diminution) or 2) *Avarana* (occlusion of its channel by other tissues)[11]. Parkinson's disease is characterized by loss of dopaminergic neurons in the compact part of substantia nigra. As a part of the neurodegenerative process protein aggregates will accumulate as Lewy bodies in dopaminergic neurons. In addition, non-dopaminergic neurons are known to be affected in Parkinsons's disease, for example, in several brain stem nuclei and the olfactoric

bulb. The pathogenic process underlying the death of dopaminergic neurons is far from fully understood. Along with mitochondrial dysfunction, excitotoxicity, neuroinflammation and oxidative stress, recent evidence indicates that accumulation of protein filaments in Lewy bodies actively takes part in the degeneration of neurons[12]. This accumulation of proteins can be considered as *Avarana* of *Kapha* causing aggregation of *Vata* further leading to *Dhatukshaya* i.e. loss of dopaminergic neurone.

Rajayapana Basti showed significant improvement in tremor, which is symptom of deranged *Vata.* It also showed significant improvement in rigidity, akinesia and bradykinesia, speech changes and memory. The effect of *Basti* on rigidity may be due to improvement in the function of *Prana, Udana* and *Vyana Vata* . There was significant improvement in picking of pins, marie sign, buttoning time, rapid alternating movement and walking time which shows breaking of *Avarana* of *Kapha* on *Vyana* as *Sarvachestas* are the function of *Vyana* Vayu[13]. *Rajayapana Basti* which is having *Rasayana*, *Balya* and *DhatuVriddhikara* properties[6] might have improved the excretory function of colon. It may also be possible that *Basti* may be acting as stimulator for many intraluminal, luminal and whole body function. Regulatory peptides like serotonin, enteroglucogon, vasoactive intestinal polypeptides (VIP) are produced in colon[14]. The deficiency of CCK-8, substance P, methionine encephalin, leucine encephalin, VIP is noted in Parkinson's disease[15]. These all peptides are related to functioning of basal ganglia and some of them like substance P, CCK-8, VIP are stimulator of dopaminergic neuronal system[16]. It might be possible that *Basti* by stimulating many factors in GIT physiology effects on regulatory functions of these peptides either by moderation or by stimulation. These further stimulated Enteric nervous system (ENS) which works in synergism with Central Nervous System (CNS), so the drugs absorbed can acts directly on neurons and modify neural function or they may reflexly acts by sending afferent impulses to central nervous system via the chemoreceptors, baro-receptors or the peripheral nerves[17]. The drug of *YapanaBasti* can also affect the nutrition due to its *Balya* (promotes the body strength)*, Brimhana* (provides nourishment to the depleting tissues) and *Rasayana* (immunomodulatory) properties. *Rajayapana Basti* given by drip method provided better results than *Putaka* method. This might be because of more retention and more absorption of drug given by drip method in *Pakvashaya* in comparison to *Putaka* method.

CONCLUSION:

In nutshell, it can be said that *Rajayapana Basti* has definiterole in the management of *Kampavata* (Parkinson's disease). However,drip method provided better results in tremors, speech Changes, pill rolling movements, micrographia,Marie sign, walking time, hand grip and foot pressurethan *Putaka* method. This can be attributed to more retention time of *Basti* given by drip method in *Pakvashaya*.

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