



"A CLINICO COMPARATIVE STUDY OF ATIBALA TAILA AND SAHACHARADI TAILA AS MULTIMODAL SNEHANA IN THE MANAGEMENT OF KAMPAVATA WITH SPECIAL REFERENCE TO PARKINSON'S DISEASE"

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ABSTRACT

Introduction: Parkinson's disease is the most common neurodegenerative disease, the cardinal features of Parkinson's disease are tremors, rigidity, and bradykinesia and gait impairment. It most commonly affects the persons over the age of 55 years. The disease condition *Kampa* (tremors) mentioned under the heading of *VataVyadhi* in *Ayurveda* is similar to Parkinson's disease. *Snehana* (Oilation) is considered the best amongst all *Vata* pacifying measures. This study is aimed to compare the effect of both of *AtibalaTaila* and *SahacharadiTaila* in the management of *Kampavata* (Parkinson's disease) through multiple routes of administration which are described by *AstangaHridaya* in *VatavyadhiChikitsa*. **Material And Methods:** 20 patients with confirmed diagnosis of Parkinson's disease were enrolled from I.P.D. of P.D. Patel Ayurveda Hospital, Nadiad. All the patients were treated in I.P.D. for 30days and treated with multimodal *Snehana*. *AtibalaTaila* in group A and *SahacharadiTaila* in group B was taken for therapeutic procedures. Patients were assessed before and after the treatment with the unified Parkinson's disease rating scale (UPDRS). **Results:** Better relief in signs and symptoms of the disease was found in group A in comparison to group B. **Conclusion:** Multimodal administration of *AtibalaTaila* is more effective than *SahacharadiTaila* in the management of *Kampavata* i.e. Parkinson's disease.

KEYWORDS : *Kampavata*, Parkinson's disease, *Abhayang*, *Nasya*, *Matrabasti*, *Shirobasti*, *Shamanartha Snehapana*

INTRODUCTION

Parkinson's disease is most common among progressive neurodegenerative disorder after Alzheimer's disease. It is characterized by bradykinesia, rest tremors, muscular rigidity, shuffling gait, flexed posture as well as non-motor symptoms.^[1] Because of its crippling nature and non-availability of curative treatment, this disease has remained a great problem in the ageing society. There is need to establish effectiveness of Ayurvedic treatment which can provide relief in signs and symptoms of Parkinson's disease.

It most commonly effects the persons over the age of 55 years^[2]. An estimated seven to 10 million people worldwide have Parkinson's disease. The prevalence of the disease ranges from 41 people per 100,000 in the fourth decade of life to more than 1,900 people per 100,000 among those who are 80 and older. The incidence of the disease, an estimated 4 percent of people with Parkinson's are diagnosed before age 50 and has an equal sex distribution.^[3]

Charaka Samhita^[4] and *Sharangdhara Samhita*^[5] have mentioned *Kampa* under *Nanatmaja Vyadhi*(specific disorders) and *Madhava Nidana* has described *Sarvangakampa*(whole body tremors) and *Shirahakampa*(tremors in head) under disease *Vepathu*(tremors).^[6] *Ashtanga Hridaya*^[7] and *Charaka Samhita*^[8] have mentioned that *Chala Guna*(mobile quality) of *Vata Dosha* is responsible for *Chesta Pravartana* (initiation of the movement). In *Kampa* (Tremors) there is *Prakopa*(provocation) of *Vata Dosha* especially of its *Chala guna*. Other symptoms of Parkinson's disease like indistinct speech (*Vakvikriti*), muscular rigidity (*Stambha*), bradykinesia (*Chesta Stambha*) are also symptoms of vitiated *Vata Dosha*. *Vata Dosha* gets vitiation in *Vrudhnavastha* (old age) which causes progressive degeneration in all body tissues with advancement of the age.

Levodopa is the most effective anti-Parkinsonian drug available.^[9] The initial dramatic response to levodopa is unfortunately not maintained. Levodopa is associated with poorly understood long term complications. Within 5 years,

about 40 percent of patients experience problems due to instability of response and this occurs all within 10 years.^[10] According to Ayurvedic consideration, *Ruksha*(dryness) and *Laghu*(light) properties of aggravated *Vata dosha* are responsible for degeneration of nigral cells in Parkinson's disease which is taken as *Dhatu Kshaya*(degeneration of tissues). Considering *Vata Prakopa* as main factor in the pathogenies of Parkinson's disease treatment of *Vatavyadhi* was applied in its management.

Taila is having anti *Vata* properties like *Snigdha* (unctuousness), *Guru*(heaviness), *Slakshna* (smoothness), *Ushna*(heat) etc. which are opposite to *Ruksha*(dryness), *Laghu*(lightness), *Khara*(coarseness), *Shita*(coldness) etc. properties of *Vata Dosha*, hence *Taila* is considered the best among all *Vata* pacifying medicaments. *Atibala Taila*.^[11] and *Sahacharadi Taila*.^[12] are indicated for *Vata Vyadhi* by *Acharya Vagbhatta* in *Astanga Hridaya*. Increased *Gunas* of *Vata Dosha* especially its *Ruksha*, *Laghu* and *Khara Gunas* are responsible for the degeneration of the body tissues. Reduction in these *Gunas* prevents further degeneration of the tissues. Reduced degeneration of brain tissues causes reduction of the sign and symptoms of Parkinson's disease.

Atibala Taila and *Sahacharadi Taila* were administered through multiple routes i.e. *Nasya* (nasal drops), *Matrabasti* (oil enema), *Abhyanga*(massage), *Shirobasti* and *Abhyantara Shamanartha Snehapana* in present study.

AIMS AND OBJECTIVES:

To compare and evaluate the effectiveness of multimodal *Snehana* with *Atibala Taila* and *Sahacharadi Taila* in the management of *Kampavata* (Parkinson's disease).

MATERIALS AND METHODS:

Selection Of The Patients:

Patients fulfilling the inclusion criteria of *Kampavata* were registered from O.P.D. and I.P.D. of the *Panchakarma* and *Kayachikitsa* departments, P.D. Patel Ayurveda Hospital of J.S. Ayurveda Mahavidyalaya, Nadiad, during February 2020 to January 2021. Detailed history was taken according to the

proforma prepared for the study incorporating all the relevant points from both *Ayurveda* and modern medical sciences.

Study Design And Sample Size:

Randomized, open labelled, comparative study.
20 patients (10 patients in each group) were registered irrespective of their sex, religion, social status etc.

ETHICS COMMITTEE CLEARANCE AND CONSENT:

As this was a clinical research, approval from Institutional Ethics Committee for Human Research (IECHR), J.S. Ayurveda Mahavidyalaya, Nadiad, was taken prior to initiation of research work its Approval No: JSAM/IECHR/104/07-2019.

DIAGNOSTIC CRITERIA

Patients were clinically diagnosed with following signs & symptoms of Parkinson's disease (*Kampavata*)

- Tremors
- Rigidity
- Bradykinesia / Akinesia
- Postural disturbance
- Mask face

Inclusion Criteria: -

1. Patients fulfilling diagnostic criteria.
2. Patients between the age group of 40-75 years of both the genders were included.

Exclusion Criteria: -

Patients suffering from severe systemic illnesses like carcinoma, uncontrolled diabetes mellitus, tuberculosis etc. were excluded.

Treatment Schedule:

All the patients were treated in IPD up to main treatment period i.e. 30 days.

Treatment	Drug & Dose	Durati on
	In group A: Atibala Taila and In group B: Sahacharadi Taila was taken for the Snehana treatment	
<i>Sarvanga Abhayanga</i> (Morning 9.00-9.30)	With 30-50ml of <i>Taila</i> according to group A or B	2 days
<i>Sarvanga Bashpa Svedana</i> (sudation) (Morning immediate after <i>Abhyanga</i>)	With <i>Nirgundi patra</i>	
<i>Virechana</i> (Purgation) (At 10.00am after <i>Abhyanga</i> and <i>Svedana</i>)	<i>Abhayanga: Sarvanga Svedana: Sarvanga Bashpa Svedana with Nirgundi patra Virechana: Dinadayalachurna (Haritaki, Svarnapatri, Ajamoda, Saindhava) (4-7 grams) + Eranda Taila (30-50 ml) with warm water according to Koshtha and Bala of the patient.</i>	1 day
<i>Samsarjana Krama</i> (post purificatory dietary regimen)		2 days
<i>Shamana Chikitsa</i>	• <i>Snehapana</i> 20 ml twice a day with warm water (at 07:00am and 05:00pm) • <i>Sarvanga Abhyanga</i> (in the morning between 09:00- 09:30am)	25 Days

• *Sarvanga Bashpa Svedana*
with *Nirgundi Patra* (immediate
after *Abhyanga*)
• *Nasya* 4 ml in each nostril (8
drops at 10:00am)
• *Shiro Basti* for 45 minutes (at
3.00 pm)
• *Matra Basti* 40 ml after dinner
(between 7-7:30pm)
Atibala Taila in group A and
Sahacharadi Taila in group B
was taken for all these
treatment procedures

Preparation Of Medicines

Medicines were Prepared at Sundar Ayurveda Pharmacy, Nadiad under the super vision of experts.

Assessment Of The Result

All the patients were clinically assessed with Unified Parkinson's disease rating scale before and after treatment. (Table no 1)

OBSERVATION AND RESULT

Observations:

Total 20 patients were registered and all of them have completed the treatment. Observations of basic information of the patients including *Prakriti*, *Dashavidha Pariksha Bhavas*, signs and symptoms of the disease as well as observations related to the therapies performed on the patients were observed.

All the patients were having age more than 50 years, maximum 60% patients were having *Vata-pitta Prakriti*, majority of the patients were having *Madhyama Aturabala Pramana*, 65% patients had *Vishama Agni* and 45% patients have *Krura Koshtha*. 90% of patients were taking *Ruksha* and *Shita Guna* dominant diet whereas 80% patients were taking *Katu Rasa* dominant diet.

Maximum 55% patients had *Madhyama Shuddhi* after *Virechana*. 65% patients retained *Matrabasti* up to 9-12 hours. 14 patients out of 20 were taking conventional medicines amongst which 07 patients were advised to reduce conventional medicines whereas 07 patients were advised to stop them totally with the progressive improvement in signs and symptoms of the disease by *Ayurvedic* management.

100% patients were having tremors, bradykinesia and speech disturbance.

RESULTS:

Results obtained were analyzed statistically by the paired 't' test. The reduction in the mean score after completion of treatment in majority of the assessment criteria were statistically significant in both the groups.

In the study of 10 patients of group A 04 patients achieved marked improvement, 06 patients got moderate Improvement whereas in the study of 10 patients of group B only one patient benefited with marked improvement, 05 patients got moderate improvement and 04 patients got mild improvement.

Though the results showed that the relief in signs and symptoms was observed in both the groups, the better improvement was found in the Group A where multimodal *Snehana* was performed by the *Atibala Taila* in comparison to Group B in which multimodal *Snehana* was performed by the *Sahacharadi Taila*.

DISCUSSION

Parkinson's is prevalent mostly in old age group (over 55yrs).

According to *Ayurveda Vriddhavastha* (above 60 years of age) is the age of *Vata Prakopa*. Vitiated *Vata* causes progressive degeneration in all the body tissues. *Kampavata* is mentioned under *Nanatmaja VataVyadhi*, *Chala Guna* of *Vata Dosha* is responsible for *Chesta Pravartana* (initiation of the movement). *Ruksha* and *Laghu* properties of aggravated *Vata Dosha* are responsible for degeneration of nigral cells in Parkinson's disease. *Taila* is considered the best amongst all *Vata* pacifying agents, which reduces *Ruksha* and *Laghu* properties of aggravated *Vata* by its *Snigdha* and *Guru* Properties. Considering *Vata Prakopa* as main factor in the pathogenies of Parkinson's disease, treatment of *VataVyadhi* can be applied in its management. In *VataVyadhi Chikitsa*, *Charaka Samhita* has mentioned that there is no any medication which excels *Snehana* (especially *Taila*) therapy in curing *Vata* diseases. *Snehana* therapy prevents further degeneration in body tissues as well as provides nourishment to the degenerated tissue elements. Maximum possible use of *Taila* (especially medicated with the medicinal plants having anti *Vata* properties) through multiple routes can help to reduce degeneration and improve the functional capacity of the tissues in degenerative disorders. Hence *Atibala Taila* and *Sahacharadi Taila* which are mentioned by *Ashtanga Hridaya* for the management of *Vata* disorders were used for the treatment of Parkinson's disease in present study to compare their effectiveness. Both of these *Taila* were administered through various routes of administration including *Nasya*, *Matrabasti*, *Shirobasti*, *Abhayanga* and *Abhyantara Shamanartha Snehapana*.

Though the results showed that the relief in signs and symptoms was observed in both the groups, the better improvement was found in the Group A where multimodal *Snehana* was performed by the *Atibala Taila* in comparison to Group B in which multimodal *Snehana* was performed by the *Sahacharadi Taila*. This may be because amongst the ingredients of *Atibala Taila*, 66% were having *Ushna Guna* and 24% were having *Shita Guna*, 48% were having *Ruksha Guna* and 24% were having *Shita Guna* as well as 70% were having *Laghu Guna* and 16.66% were having *Guru Guna* whereas amongst the ingredients of *Sahacharadi Taila*, 54% were having *Ushna Guna* and 33% were having *Shita Guna*, 66.66% were having *Ruksha Guna* and 15.15% were having *Snigdha Guna* whereas 69.69% were having *Laghu Guna* and 13 % ingredients were having *Guru Guna*. *Atibala*, the main ingredient of *Atibala Taila* is having *Snigdha* and *Picchila Guna* which *Sahachara*, the main ingredient of *Sahacharadi Taila* do not have. This indicates that the anti *Vata* properties are more in the ingredients of the *Atibala Taila* than in the

ingredients of *Sahacharadi Taila*.

Abhayanga with *Atibala Taila* and *Sahacharadi Taila* nourishes peripheral tissues and causes increase in muscle strength which improves the activities of daily living and other motor activities in the patients of Parkinson's disease.

Matrabasti with *Atibala Taila* and *Sahacharadi Taila* pacifies aggravated *Vata Dosha* in *Pakvashaya* which is the main site of *Vata Dosha*. Pacification of *Vata Dosha* in *Pakvashaya* causes pacification of aggravated *Vata Dosha* all over the body and prevents the degeneration in various tissues in the body which ultimately retards the progress of the degenerative diseases like Parkinson's disease.

Nasya and *Shiro Basti* with *Atibala Taila* and *Sahacharadi Taila* reduces aggravated *Vata Dosha* especially in the *Shira* which can prevent or reduce degeneration in brain tissues and improves the function of the brain which results in the relief of the symptoms of the degenerative diseases of the brain like Parkinson's disease.

Abhyantara Shamanartha Snehapana with *Atibala Taila* and *Sahacharadi Taila* pacifies aggravated *Vata Dosha* and prevents degeneration of body tissues and ultimately increase functional capacities of the patients having degenerative diseases including Parkinson's disease as discussed above.

The Ayurvedic practitioners do not prefer to use *Sneha* through multiple routes simultaneously. *Charaka Samhita* mentions in *Siddhi Sthana* chapter 04 that *Sneha* should be administered through *Gudamarga* and *Kanthamarga Ananantara*.^[13] *Chakrapani* explained it that *Anantaram* means not to administer *Sneha* through both of these routes at a same time without gap. It means that we can administer *Sneha* through oral and rectal route at different timings in a day keeping gap between both of them. In the present study, the *Atibala Taila* and *Sahacharadi Taila* were given orally during day time and the *Matra Basti* of these was administered after dinner in all the patients of both the groups.

CONCLUSION:

The results are encouraging. Significant relief was found in all signs and symptoms of the Parkinson's disease in the patients of both the groups. The conventional medicaments were also reduced or stopped in the patients who were taking them. Multi modal Ayurvedic management of *Kampavata* (Parkinson's disease) with *Atibala Taila* is more effective in relieving signs and symptoms of the disease in comparison to *Sahacharadi Taila*.

Table No. 2: Effect Of Therapy On Signs And Symptoms In The 10 Patients Of Kampavata In Group A

No	Signs & symptoms	B. T	A. T	Diff	%	N	SQRT	SD	SE	T	P value
1	Intellectual Impairment	1.2	0.6	0.6	50.00	10	3.16	0.51	0.16	3.67	<0.01
2	Thought disorders	2.5	1.6	0.9	36.00	10	3.16	0.56	0.17	5.01	<0.001
3	Depression	2.1	1.4	0.7	33.33	10	3.16	0.48	0.15	4.58	<0.01
4	Motivation / Initiative	2.2	1.5	0.7	31.81	10	3.16	0.48	0.15	4.58	<0.01
5	Speech	2.4	1.5	0.9	37.50	10	3.16	0.31	0.15	3.60	<0.01
6	Salivation	1.0	0.5	0.5	50.00	10	3.16	0.52	0.16	3.00	<0.01
7	Swallowing	0.6	0.2	0.4	66.66	10	3.16	0.69	0.22	1.80	<0.01
8	Hand writing	2.2	1.4	0.8	36.36	10	3.16	0.42	0.13	6.00	<0.001
9	Cutting food	2.3	1.3	1.0	43.47	10	3.16	0.47	0.14	9.00	<0.001
10	Dressing	2.5	1.6	0.9	36.00	10	3.16	0.31	0.10	1.99	<0.05
11	Hygiene	2.2	1.0	1.2	54.54	10	3.16	0.78	0.24	4.81	<0.01
12	Turning in bed	2.5	1.5	1.0	40.00	10	3.16	0.47	0.14	6.70	<0.001
13	Falling	1.3	0.4	0.9	69.23	10	3.16	0.56	0.17	5.01	<0.001
14	Freezing	2.1	1.0	1.1	52.38	10	3.16	0.31	0.10	11.0	<0.001
15	Walking	2.2	1.3	0.9	40.90	10	3.16	0.31	0.10	9.00	<0.001
16	Tremor	2.2	1.1	1.1	50.00	10	3.16	0.73	0.23	4.71	<0.01
17	Sensory symptoms	2.0	1.0	1.0	50.00	10	3.16	0.47	0.14	6.70	<0.001
18	Speech	2.1	1.2	0.9	42.85	10	3.16	0.42	0.10	9.00	<0.001
19	Facial expression	2.4	1.3	1.1	45.83	10	3.16	0.31	0.10	11	<0.001
20	Tremors at rest: face, lips, chin	1.6	0.9	0.7	43.75	10	3.16	0.48	0.15	4.58	<0.01

21	Hands	Rt	1.8	0.8	1.0	55.55	10	3.16	0.47	0.14	6.70	<0.001
22		Lt	1.4	0.8	0.6	42.85	10	3.16	0.51	0.16	3.67	<0.01
23	Feet:	Rt	1.3	0.7	0.6	46.15	10	3.16	0.51	0.16	3.67	<0.01
24		Lt	1.2	0.6	0.6	50.00	10	3.16	0.51	0.16	3.67	<0.01
25	Action tremors:	Rt. Hand	1.9	0.9	1.0	52.63	10	3.16	0.66	0.21	4.74	<0.01
26		Lt. Hand	1.3	0.8	0.5	38.46	10	3.16	0.52	0.16	3.00	<0.01
27	Rigidity: Neck		1.2	0.6	0.6	50.00	10	3.16	0.69	0.22	2.71	<0.05
28	Upper extremities	Rt	1.7	0.9	0.8	47.05	10	3.16	0.42	0.13	6.00	<0.001
29		Lt	1.3	0.6	0.7	53.84	10	3.16	0.67	0.21	3.27	<0.01
30	Lower extremities	Rt	1.6	0.9	0.7	43.75	10	3.16	0.48	0.15	4.58	<0.001
31		Lt	1.2	0.6	0.6	50.00	10	3.16	0.69	0.22	2.71	<0.05
32	Finger taps	Rt	1.9	1.1	0.8	42.10	10	3.16	0.42	0.13	6.00	<0.05
33		Lt.	1.8	1.2	0.6	33.33	10	3.16	0.51	0.16	3.67	<0.01
34	Hand Grips	Rt	1.5	0.9	0.6	40.00	10	3.16	0.69	0.22	2.71	<0.05
35		Lt	1.5	0.9	0.6	40.00	10	3.16	0.69	0.22	2.71	<0.05
36	Hand pronate/supinate:	Rt	1.7	0.8	0.9	52.94	10	3.16	0.31	0.10	9.00	<0.001
37		Lt	1.7	0.9	0.8	47.05	10	3.16	0.63	0.20	4.00	<0.01
38	Leg agility:	Rt	1.9	1.1	0.8	42.10	10	3.16	0.42	0.13	6.00	<0.001
39		Lt	1.6	1.0	0.6	37.50	10	3.16	0.51	0.16	3.67	<0.01
40	Arise from chair		2.4	1.5	0.9	37.50	10	3.16	0.56	0.17	5.01	<0.001
41	Posture		2.3	1.5	0.8	34.78	10	3.16	0.42	0.13	6.00	<0.001
42	Gait		2.4	1.5	0.9	37.50	10	3.16	0.31	0.10	9.00	<0.001
43	Postural stability		2.0	1.5	0.5	25.00	10	3.16	0.52	0.16	3.00	<0.01
44	Body bradykinesia		2.4	1.6	0.8	33.33	10	3.16	0.42	0.13	6.00	<0.001

Table No 2: Effect Of Therapy On Signs And Symptoms In The 10 Patients Of Group B Kampavata

No	Signs & symptoms		B. T	A. T	Diff	%	N	SQRT	SD	SE	T	P value
1	Intellectual Impairment		1.0	0.8	0.2	20.00	10	3.16	0.42	0.13	1.50	<0.05
2	Thought disorders		2.0	1.2	0.8	40.00	10	3.16	0.63	0.20	4.00	<0.001
3	Depression		1.9	1.4	0.5	26.31	10	3.16	0.70	0.22	2.23	<0.01
4	Motivation / Initiative		1.5	0.6	0.9	60.00	10	3.87	0.31	0.10	9.00	<0.001
5	Speech		1.7	1.0	0.7	41.17	10	3.87	0.48	0.15	4.58	<0.001
6	Salivation		0.6	0.4	0.2	33.33	10	3.87	0.42	0.13	2.50	<0.01
7	Swallowing		0.6	0.3	0.3	50.00	10	3.87	0.48	0.15	1.96	<0.05
8	Hand writing		2.1	1.6	0.5	23.80	10	3.87	0.52	0.16	3.00	<0.01
9	Cutting food		2.0	1.5	0.5	25.00	10	3.87	0.52	0.16	3.00	<0.01
10	Dressing		2.1	1.3	0.8	38.09	10	3.87	0.63	0.20	4.00	<0.001
11	Hygiene		1.6	1.3	0.3	18.75	10	3.87	0.48	0.15	1.96	<0.05
12	Turning in bed		1.8	1.3	0.5	27.77	10	3.87	0.52	0.16	3.00	<0.01
13	Falling		0.8	0.5	0.3	37.50	10	3.87	0.48	0.15	1.96	<0.05
14	Freezing		1.5	0.9	0.6	40.00	10	3.87	0.51	0.16	3.67	<0.01
15	Walking		1.9	1.3	0.6	31.57	10	3.87	0.51	0.16	3.67	<0.01
16	Tremor		2.2	1.5	0.7	31.81	10	3.87	0.48	0.15	4.58	<0.001
17	Sensory symptoms		1.8	1.4	0.4	22.22	10	3.87	0.51	0.16	2.44	<0.01
18	Speech		1.8	1.2	0.6	33.33	10	3.87	0.51	0.16	3.67	<0.01
19	Facial expression		2.0	1.5	0.5	25.00	10	3.87	0.52	0.16	3.00	<0.01
20	Tremor at rest: face, lips, chin		1.6	0.9	0.7	43.75	10	3.87	0.67	0.21	3.27	<0.01
21	Hands	Rt	2.4	1.6	0.8	33.33	10	3.87	0.63	0.20	4.00	<0.001
22		Lt	1.2	1.1	0.1	08.33	10	3.87	0.56	0.17	0.55	<0.05
23	Feet:	Rt	1.8	1.4	0.4	22.22	10	3.87	0.51	0.16	2.44	<0.01
24		Lt	1.2	0.8	0.4	33.33	10	3.87	0.51	0.16	2.44	<0.01
25	Action tremor:	Rt	2.5	1.9	0.6	24.00	10	3.87	0.51	0.16	3.67	<0.01
26		Lt	1.1	0.9	0.2	18.18	10	3.87	0.42	0.13	1.50	<0.05
27	Rigidity: Neck		1.5	0.9	0.7	43.75	10	3.87	0.67	0.21	3.27	<0.01
28	Upper extremities	Rt	1.5	1.1	0.4	26.66	10	3.87	0.51	0.16	2.44	<0.01
29		Lt	0.8	0.5	0.3	37.50	10	3.87	0.48	0.15	1.96	<0.05
30	Lower extremities	Rt	1.6	1.1	0.5	31.25	10	3.16	0.52	0.16	3.00	<0.01
31		Lt	0.9	0.6	0.3	33.33	10	3.16	0.48	0.15	1.96	<0.05
32	Finger taps	Rt	1.9	1.3	0.6	31.57	10	3.16	0.51	0.16	3.67	<0.01
33		Lt.	1.2	0.6	0.6	50.00	10	3.16	0.51	0.16	3.67	<0.01
34	Hand Grips	Rt	1.7	1.3	0.4	23.52	10	3.16	0.51	0.16	2.44	<0.01
35		Lt	1.0	0.7	0.3	30.00	10	3.16	0.48	0.15	1.96	<0.05
36	Hand pronate/supinate:	Rt	1.8	1.2	0.6	33.33	10	3.16	0.51	0.16	3.67	<0.01
37		Lt	1.1	0.7	0.4	36.36	10	3.16	0.51	0.16	2.44	<0.01
38	Leg agility:	Rt	1.9	1.4	0.5	26.31	10	3.16	0.52	0.16	3.00	<0.01
39		Lt	1.1	1.0	0.1	09.09	10	3.16	0.31	0.10	1.00	<0.05
40	Arise from chair		1.7	1.1	0.6	35.29	10	3.16	1.51	0.16	3.67	<0.01
41	Posture		1.6	1.3	0.3	18.75	10	3.16	0.48	0.15	1.96	<0.05
42	Gait		2.0	1.3	0.7	35.00	10	3.16	0.48	0.15	4.58	<0.001

43	Postural stability		1.9	1.2	0.7	36.84	10	3.16	0.48	0.15	4.58	<0.001
44	Body bradykinesia		2.0	1.5	0.5	25.00	10	3.16	0.52	0.16	3.00	<0.01

Table No: 3 Results: Testing Of Hypothesis Through Two Sample T-test

Signs and symptoms		Difference of mean		Variance		df	T value	P Value
		Group A	Group B	Group A	Group B			
Mentation			0.2	0.26	0.17	18	2.13	<0.05
Thought disorder		0.9	0.8	0.32	0.40	18	3.37	<0.05
Depression		0.7	0.5	0.23	0.50	18	2.73	<0.05
Motivation		0.7	0.9	0.23	0.10	18	2.09	<0.05
Speech		0.9	0.7	0.10	0.23	18	2.09	<0.05
Salivation		0.5	0.2	0.27	0.17	18	1.40	<0.05
Swallowing		0.4	0.3	0.48	0.23	18	1.37	<0.05
Handwriting		0.8	0.5	0.17	0.27	18	2.40	<0.05
Cutting food		1.0	0.5	0.22	0.27	18	2.23	<0.05
Dressing		0.9	0.8	0.10	0.40	18	2.44	<0.05
Hygiene		1.2	0.3	0.62	0.23	18	3.07	<0.05
Turning in bed		1.0	0.5	0.22	0.27	18	2.23	<0.05
Falling		0.9	0.3	0.32	0.23	18	2.54	<0.05
Freezing		1.0	0.6	0.00	0.26	18	2.44	<0.05
Walking		0.9	0.6	0.10	0.26	18	3.56	<0.05
Tremor		1.1	0.7	0.54	0.23	18	3.43	<0.05
Sensory symptoms		1.0	0.4	0.22	0.26	18	2.71	<0.05
Speech		0.9	0.6	0.10	0.26	18	2.56	<0.05
Facial expression		1.0	0.5	0.00	0.27	18	3.00	<0.05
Tremor at rest: -face, lips, chin		0.7	0.7	0.23	0.45	18	2.45	<0.05
Hands	Rt	1.0	0.8	0.22	0.40	18	2.80	<0.05
	Lt	0.6	0.1	0.26	0.32	18	2.06	<0.05
Feet	Rt	0.6	0.4	0.26	0.26	18	3.86	<0.05
	Lt	0.6	0.4	0.26	0.26	18	3.86	<0.05
Action tremor	Rt	1.0	0.6	0.44	0.26	18	2.15	<0.05
	Lt	0.5	0.2	0.27	0.17	18	2.40	<0.05
Rigidity: -Neck		0.6	0.0	0.48	0.0	18	2.71	<0.05
Upper Extremities	Rt	0.8	0.4	0.17	0.26	18	2.89	<0.05
	Lt	0.7	0.3	0.45	0.23	18	2.52	<0.05
Lower Extremities	Rt	0.7	0.5	0.23	0.27	18	1.88	>0.05
	Lt	0.6	0.3	0.48	0.23	18	2.11	<0.05
Finger taps	Rt	0.8	0.6	0.17	0.26	18	2.94	<0.05
	Lt	0.6	0.3	0.26	0.17	18	2.13	<0.05
Hand grip	Rt	0.6	0.4	0.48	0.26	18	1.72	>0.05
	Lt	0.6	0.3	0.48	0.23	18	3.11	<0.05
Hand pronate/supinate	Rt	0.9	0.6	0.10	0.26	18	2.56	<0.05
	Lt	0.8	0.4	0.40	0.26	18	2.54	<0.05
Leg agility	Rt	0.8	0.5	0.17	0.27	18	2.40	<0.05
	Lt	0.6	0.1	0.26	0.10	18	2.61	<0.05
Arise from chair		0.9	0.6	0.32	0.26	18	2.23	<0.05
Posture		0.8	0.3	0.17	0.23	18	2.46	<0.05
Gait		0.9	0.7	0.10	0.23	18	3.90	<0.05
Postural stability		0.5	0.7	0.27	0.23	18	1.88	>0.05
Body Bradykinesia		0.8	0.5	0.17	0.27	18	2.40	<0.05

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