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A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFICACY OF CONVENTIONAL METHOD OF KATI BASTI AND ELECTRICALLY POWERED KATI BASTI YANTRA WITH NIRGUNDI TAILA IN VATAJA GRIDHRASI W.R.T SCIATICA

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ABSTRACT

Introduction: Gridhrasi is a one among the Nanatmaja Vatavyadhi. Acharya Charaka mentioned two types of Gridhrasi i.e., Vataja and Vata-Kaphaja. The symptoms of Vataja Gridhrasi includes Stambha, Ruk, Toda and Spandana in the Sphik (gluteal region),Kati Pradesha (low back), Uru (thigh), Janu (knee), Jangha (calf), and Pada (feet). Tandra, Aruchi, Gaurava are additional symptoms if there is Kaphanubandha. On the basis of the symptoms, it can be correlated with Sciatica, which is characterised by pain and paresthesia in the distribution of sciatic nerve. Ayurvedic management encompasses various approaches. Acharya Harita emphasizes Swedana and Raktamokshana as the treatment modality for Gridhrasi. Kati Basti is one such Snigdha Sweda procedure, which possess the combined effect of both Snehana as well as Swedana. And considering the difficulties in the procedure, the electrically powered Kati Basti Yantra was designed. **Methods:** 30 participants diagnosed with Gridhrasi were selected from OPD of KVG Ayurveda Medical Hospital, Sullia. They were allocated randomly into 2 groups; Group A was subjected to Conventional method of Kati Basti and Group B with Electrically powered Kati Basti Yantra with Nirgundi Taila for 7 days. The effect of therapy was assessed with subjective and objective parameters before treatment, after treatment and after 14 days of follow up. **Results:** Both the groups showed statistically significant results in all the parameters of assessment as p value is <0.001. And difference

between both methods is statistically insignificant as p value is less than 0.05. **Conclusion:** Both the methods showed statistically significant results in management of Gridhrasi. And as the difference between both methods of Kati Basti is statistically insignificant. So, electrically powered Kati Basti Yantra can be considered as a substitute treatment modality for the Conventional Method of Kati Basti.

KEYWORDS: Gridhrasi, Sciatica, Kati Basti, Electrically powered Kati Basti Yantra.

INTRODUCTION

The realm of Ayurveda lies its foundation in the concept of Tridoshas. Vata dosha has the chief dominance and in balanced state is responsible for the all the physiological activities of body and in imbalanced state is responsible for diseases.[1] Gridhrasi is one such disease caused by aggravated Vata Dosha as Acharya Charaka enumerates Gridhrasi among the eighty Nanatmaja Vatavyadhi.[2] Acharya Charaka has mentioned it's types i.e., Vataja and VataKaphaja Gridhrasi and also described Lakshanas as Ruk (pain), Toda (pricking), Stambha (stiffness) and Spandana(twitching) in Sphik (gluteal region), Kati Prishta (lowback), Uru (thigh), Janu (knee), Jangha (calf) till Pada (feet) regions.[3] Acharya Sushruta has described that the aggravated Vata invades the Kandaras of Parshinipratyanguli which leads to pain and inability to extend the leg.[4]

Considering the symptoms, Gridhrasi is correlated with Sciatica which is characterised by low backache radiating to toes in the lateral aspect of the thigh caused by irritation of Sciatic Nerve. Contemporary medical treatments primarily focus on pain management using analgesics and anti-inflammatory drugs. However, they often offer only temporary relief, without addressing the underlying cause, leading to recurring episodes and medication dependency. In stark contrast, Ayurveda offers a comprehensive approach to the management of Gridhrasi. Acharya Harita gives importance to Swedana for the treatment of Gridhrasi.[5] In Gridhrasi, Vata involvement is evident as pain and disability, so Snehana and Swedana Chikitsa is marked as an effective treatment option.[6]

One such Swedana modality is 'Kati Basti'. Kati Basti is a Snigdha Sweda procedure which involves pooling of medicated oils to the lower back area with the help of a dough frame. The temperature of the oil is maintained throughout the procedure with repetitive changing of oil. To overcome the drawbacks of the conventional method, Kati Basti Yantra was designed,

which is electrically powered instrument designed to perform Kati Basti with ease as well as to improve the efficacy of the procedure.

So, the study was designed with the below mentioned objectives

1. To explore the therapeutic efficacy of Kati Basti in the management of Gridhrasi.
2. To compare the conventional method of Kati Basti with the Kati Basti done with Electrically powered Kati Basti Yantra and establish it as potential substitute of the conventional method.

MATERIALS AND METHODS

Source of data

- **Sample source:** Patients suffering from Lakshanas of Gridhrasi had been selected from OPD/IPD department in KVG Ayurveda Medical College & Hospital Sullia.
- **Drug Source:** Nirgundi was collected from local areas after proper identification and Taila was prepared in KVG Ayurveda Pharma and Research Centre, Sullia.

Method of collection of data: 30 Patients of Vataja Gridhrasi admitted in IPD were selected for the study.

Inclusion Criteria

- Patients having the classical Lakshanas of Vataja Gridhrasi.
- Patients who are Swedana Yogya according to Ayurveda classics, irrespective of gender, occupation and socio-economic status.
- Patients between 20 to 70 years of age.

Exclusion Criteraia

- Patients with conditions mentioned in Swedana Ayogyas.
- Patients with association of other systemic disorders.
- Patient below 20 years and above 70 years of age.

Informed Consent: Consent form in Kannada language was prepared and prior consent of all participants were obtained on the consent form.

Duration of Study

Kati Basti	7 days
Follow Up	14 days
Total Study Duration	21 days

Intervention

30 patients of Vataja Gridhrasi will be divided into 2 groups- Group A and Group B.

Group A: Conventional Kati Basti with Nirgundi Taila for 7 days.

Group B: Kati Basti with Electrically powered Kati Basti Yantra with Nirgundi Taila for 7 days.

GROUP A: CONVENTIONAL METHOD OF KATI BASTI

Poorva Karma

- Preparation of the patient: - Patient was advised to take Laghu Bhojana 2 hrs before treatment. After evacuating the bowel and bladder, the patient was subjected to Kati Basti. The patient was asked to lie down in prone position with low back exposed.
- Preparation of frame: - 500 g of black gram flour was taken in a wide mouthed vessel and mixed with appropriate amount of warm water to prepare a soft dough. A ring frame is made with 12.5 cm diameter and 5 cm height.
- Oil was heated in water bath and measured with the digital thermometer and recorded.

Pradhana Karma

- The prepared circular ring was placed over the Kati Pradesha and both the inner and outer lower margins were sealed by pressing the dough against the skin so that there were no leakages during the procedure.
- After checking and recording the temperature of the Taila, it was gradually poured into the frame. The level of the oil was kept about 1 inch above the skin.
- Once the temperature decreases, the temperature was recorded. And the Taila was replaced with the help of spoon or cotton pad.
- After measuring the temperature, fresh warm oil was then poured into the frame. The cooled oil taken out was kept in water bath for heating so as to reuse again. Thus, the temperature was maintained and recorded throughout the procedure.

Paschat Karma

- The oil was removed completely with the help of spoon or cotton pad. Dough ring was removed.
- Mild Abhyanga was done on sacral and lumbar region. Patient was advised hot water bath after 15 minutes of rest.

GROUP B: KATI BASTI WITH ELLECTRICALLY POWERED- KATI BASTI YANTRA

Poorva Karma

- Preparation of the patient: - Patient was advised to take Laghu Bhojana 2 hrs before treatment. After evacuating the bowel and bladder, the patient was subjected to Kati Basti. The patient was asked to lie down on abdomen with low back exposed.
- Preparation of frame: - 250 g of black gram flour is taken in a wide mouthed vessel and is mixed with appropriate amount of warm water to prepare a soft dough for fixing the Yantra to the low back area.

Pradhana Karma

- The Kati Basti Yantra was fixed over the Kati Pradesha with the help of Masha Dough.
- Taila was gradually poured into the frame. The oil was made to immerse the heating rods of the Yantra.
- The Yantra was connected to an electric source and the temperature was set according to the patient's tolerability.
- The procedure was continued and temperature recorded by the Thermosensor of the device as well as the temperature of the oil checked with digital industrial thermometer was recorded after the interval of 5 minutes.

Paschat Karma

- The Kati Basti Yantra was plugged off.
- The oil was removed completely with the help of cotton pad.
- Kati Basti Yantra was removed. And mild Abhyanga was done on sacral and lumbar region. Patient was advised hot water bath after 15 minutes of rest.

ASSESSMENT TOOLS

The assessment of effect of treatment was done on the basis of clinical changes observed in patients. The parameters have been divided into subjective criteria and objective criteria for assessment.

Subjective Criteraia

- Stambha
- Ruk
- Toda
- Spandana

Objective Criteria

- SLR Test

Questionnaires

- To assess extent of disability:- Oswestry Disability Index
- To assess extent of mobility:-Sugarbaker and Barofsky- Clinical Mobility Scale
- To assess intensity of symptoms:-SBI- Sciatica Bothersomeness Index
- To assess frequency of symptoms:-SFI- Sciatica Frequency Index

GRADING FOR ASSESSMENT OF RESULTS

Subjective Criterias- Stambha, Ruk, Toda and Spandana were graded according to the gradings mentioned in Table No.1

Table No.1: Grading of Subjective Criterias.

STAMBHA	GRADING
Absent	0
Stiffness for less than 15 mins	1
Stiffness for 15-30 mins	2
Stiffness for 30 mins - 1 hour	3
Stiffness for more than 1 hour	4
RUK(VAS)	
None (0)	0
Mild (1-3)	1
Moderate(4-6)	2
Severe(7-10)	3
TODA	
Absent	0
Mild pricking Paín, occasionally in a day	1

Moderate pricking pain, after movement, daily persistent	2
Severe pricking pain, persistent	3
SPANDANA	
Absent	0
Mild twitching Paín, occasionally in a day	1
Moderate twitching pain, after movement, daily persistent	2
Severe twitching pain, persistent	3

Objective Criteria- SLR was graded according to Grading mentioned in Table No. 2

Table No.2: Grading of SLR.

0^0	**0**
More than 0^0-30^0	1
30^0-70^0	2
More than 70^0	3

Questionnaires

1. Oswestry Disability Index: Oswestry disability index is an extremely important tool to measure patient's permanent functional disability. It is a self-administered questionnaire divided into 10 sections designed to assess limitations of various activities of daily living. Each section is scored on a 0-5 scale, 5 representing the greatest disability. The index was calculated by dividing the summed score by the total possible score.
2. Clinical Mobility Scale: The scale is used to assess the patient's degree of mobility over time. Grades are given according to the 8 parameters. The total score is calculated by adding all 8 subscores.
3. Sciatica Bothersomness Index(SBI) & Sciatica Frequency Index(SFI): The scale is to assess the severity and frequency of the symptoms of Sciatica. The patient is asked to grade the symptoms on the scale of 1 to 6. Total score is calculated by adding up the grades of each symptom.

The grading was recorded on 1^{st} day, before starting of treatment shedule. The changes were observed and recorded on 7^{th} day and 21^{st} day.

RESULT AND DISCUSSION

The effect of the therapy was assessed statistically with paired t test. The effect of the therapy on all the parameters in Group A and Group B are showed in Table No.3 and Table No.4

Group A showed 37.68% improvement and Group B showed 33.49% improvement i.e., both groups showed moderate relief (31-60%) in the symptoms of Vataja Gridhrasi w.s.r to Sciatica.

EFFECT OF THERAPY ON ALL PARAMETERS IN GROUP A

Table No. 3: Effect of Therapy on all parameters in Group A.

Group A (Conventional Method of Kati Basti)								
Parameter	**BT**	**AF**	**MEAN DIFF.**	**SD**	**SE**	**t**	**p-value**	**SIG.**
Stambha	2.00	0.67	1.33	0.62	0.211	6.325	<0.0001	HS
Ruk	1.80	0.47	1.33	0.52	0.120	10.58	<0.0001	HS
Toda	0.80	0.07	0.73	0.26	0.182	4.032	<0.001	S
Spandana	0.60	0.07	0.53	0.26	0.165	3.227	<0.001	S
Active SLR	2.33	2.47	-0.14	0.52	0.091	1.467	>0.05	NS
Passive SLR	2.33	2.53	-0.20	0.52	0.107	1.870	>0.05	NS
ODI	18.67	6.07	12.60	4.13	1.141	11.038	<0.0001	HS
CMS	16.40	21.60	-5.20	2.06	0.571	9.114	<0.0001	HS
SBI	7.33	1.53	5.80	1.25	0.509	11.395	<0.0001	HS
SFI	8.47	2.47	6.0	1.81	0.662	9.065	<0.0001	HS

EFFECT OF THERAPY ON ALL PARAMETERS IN GROUP B

Table No. 4: Effect of Therapy on all parameters in Group B.

Group B (Electrically powered Kati Basti Yantra)								
Parameter	**BT**	**AF**	**MEAN DIFF.**	**SD**	**SE**	**t**	**p-value**	**SIG.**
Stambha	2.07	0.33	1.73	0.49	0.220	7.596	<0.0001	HS
Ruk	1.87	0.60	1.27	0.51	0.153	8.264	<0.0001	HS
Toda	0.33	0.00	0.33	0.00	0.126	2.645	<0.001	S
Spandana	0.93	0.13	0.80	0.35	0.175	4.582	<0.001	S
Active SLR	2.53	2.67	-0.14	0.49	0.091	1.467	>0.05	NS
Passive SLR	2.60	2.67	-0.07	0.49	0.067	1.00	>0.05	NS
ODI	18.27	8.20	10.07	4.65	0.707	14.24	<0.0001	HS
CMS	17.13	21.07	-3.93	2.43	0.613	6.415	<0.0001	HS
SBI	7.20	2.00	5.20	1.13	0.312	16.68	<0.0001	HS
SFI	8.53	2.27	6.27	0.88	0.371	16.68	<0.0001	HS

COMPARATIVE RESULTS OF GROUP A AND GROUP B

Comparative analysis over the effect of the treatment in the both groups was done statistically with ‘unpaired t test’. The difference in Group A and Group B is statistically not significant as p value is less than 0.05. Thus, statistically the groups have no difference in the efficacy of the therapy.

Table No.5: Showing Comparative Results of Both Groups.

GROUP A	GROUP B	MEAN DIFFERENCE	SE	t VALUE	p VALUE
37.68%	33.49%	4.19	1.960	-2.143	< 0.05

DISCUSSION

Kati Basti is a type of Swedana procedure in which heated medicated oil is pooled over the lumbosacral region for a certain period of time. As the procedure utilizes Snigdha Drava i.e., Taila and there is Agni Samyoga while heating the taila. Hence, it is considered as a form of Snigdha Sweda.

Kati Basti possesses both the properties of Snehana & Swedana. As Vata is Sheeta, Ruksha in nature. Sweda being Ushna and with Taila being Snigdha in nature, alleviates Vata. Swedana increases sweat and brings out Maladravyas along with sweat. Thus, it decreases kleda in the body resulting in the reduction of Stambha (Stiffness) which is common symptom of Gridhrasi. After Swedana Romancha, Toda, Vedana (Pain), Shotha (Oedema), Angagraha, Ayama vanishes and the organs become softs and elastic. Gridhrasi is clearly mentioned in Swedarha Vyadhis and also Gridhrasi is a Shoolapradhana Vatavyadhi and Shulavyuparama (destruction of pain) is the sign of proper Swedana.

During the study, it has been observed that Males tolerate more temperature than Females. Maximum temperature tolerated by Males on Average is 46.9^0 and Females is 45.4^0. As females are more sensitive to increased temperatures than males.

In the present study, the patients who are having Vata Kapha Prakruti showed tolerance to temperature more than other Prakruti. The difference was observed to be on average 1.25℃. This owes to the quality of Vata and Kapha where in Sheeta predominance is observed. The person who were having Pitta predominant Prakruti i.e., Vata Pitta and Pitta Kapha showed slightly reduced tolerance to temperature as compared to Kapha-Vata Prakruti.

In Group A, the overall maximum temperature recorded was 49° C, and minimum was 39° C. The Conventional method of Kati Basti showed the average temperature variation of +/- 3^0.

In Group B, the device maintained the temperature set for the patient with the average of +/- 0.8^0 and +/- 1.5^0 than real time temperature.

Though the procedure is an effective localized treatment modality. Various drawbacks were observed.

1. **CONTINUOUS CHANGING OF OIL:-** The oil gets cooled down in about 2-4 minutes. Thus, needs continuous changing of the oil throughout the procedure.
2. **NON-UNIFORM TEMPERATURE:-** As the oil is changed repeatedly, the continuous heat cannot be imparted on the site of tenderness.
3. **LOSS OF TAILA:-** The Conventional Method of Kati Basti showed average loss of 22 ml/day.
4. **HUMAN RESOURCE:-** The method needs two therapists and continuous efforts throughout the procedure.
5. **TEMPERATURE CONTROL:** There are increased chances of burns, as there is no control over the temperature of the oil and perception of heat is subjective to therapists and patients.

Electrically powered Kati Basti Yantra

Electrically powered Kati Basti yantra was designed to optimise the Conventional Method of Kati Basti. The instrument was designed to maintain uniform temperature throughout the procedure without the need to change the oil repeatedly. The design aided the flexibility of setting the temperature according to the patient's tolerance. It is cost effective modality as the quantity of oil needed for the procedure is reduced from 800 ml in conventional method of Kati Basti to 350 ml in Electrically powered Kati Basti Yantra as there is no necessity of changing the oil as well as on average the loss of Taila per day is 8.8ml/day only. 250g of Masha is required for the ring frame instead of 500 g in conventional method of Kati Basti. The Kati Basti Yantra maintained the average temperature uniformly with the variation of +/- 0.8 degrees. The number of therapists for the procedure can also be reduced as only one therapist can carry out the procedure without any difficulty.

PROBABLE MODE OF ACTION

In Kati Basti the warm oil is detained for a long time at the site of pathology the resultant effect of the procedure according to the physiology is as stated below -

Physiological effects of heat therapy include pain relief increases in blood flow and metabolism, and increased elasticity of connective tissue. Neural transduction of heat is mediated by TRP vanilloid 1 (TRPV1) receptors, which are ion channels activated by noxious heat. Increasing tissue temperature stimulates vasodilation and increases tissue blood flow

which is thought to promote healing by increasing the supply of nutrients and oxygen to the site of injury. The rate of local tissue metabolism is also increased by warming, which may further promote healing. Heat-induced changes in the viscoelastic properties of collagenous tissues may underlie the demonstrated efficacy of heat therapy for improving range of movement. An increase in the temperature of connective tissue, in particular the collagenous tissue such as skin, muscle, tendon, ligament or articular capsule, will be accompanied by an increase in the elasticity. Heat can improve the elasticity of fibrous tissue by a factor of 2 to 10. At the same time, the viscosity of matrix decrease. Consequently, connective tissue such as tendon tissue and ligament will also become more elastic.

CONCLUSION

After comparing the before and after follow up treatment of all the criterias in both Group A and Group B, it was concluded that there were statistically significant changes observed in almost all the parameters as $p < 0.001$ except in Active and Passive SLR where p value was > 0.05.

Overall effect of therapy on showed both Group A and Group B Moderate improvement.

Group A showed 37.68% improvement and Group B showed 33.49% improvement, but on comparison it was observed that electrically powered Kati Basti Yantra maintained temperature throughout the procedure with less variation of temperature than Conventional method of Kati Basti. Moreover, less loss of oil was observed in electrically powered Kati Basti Yantra. And the electrically powered Kati Basti Yantra showed no complications like burns, shock etc. throughout the course of research work. Thus, it can be considered more safe procedure than Conventional method of Kati Basti.

Hence, **'The electrically powered Kati Basti Yantra can be considered as a substitute treatment modality for the Conventional method of Kati Basti'.**

Scope of further improvements were observed.

- The device can be added with battery backup for prolong use irrespective of electricity.
- The oil needs to be stirred intermittently to maintain temperature. So, a stirrer can be attached to the device.

REFERENCES

1. Acharya Agnivesha- Charaka Samhita Vidyotini Hindi commentary by Pr. Kashinatha Shastri and Dr. Gorakhanatha Chaturvedi, Chaukhambha Bharti Academy Varanasi, Reprint year 2009, Volume 1, Sutrasthana, Chapter No. 28, Shloka No. 56, 787.
2. Acharya Agnivesha-Charaka Samhita of Agnivesha with Ayurveda Deepika commentary of Sri Chakrapanidatta, Edited by VaidyaYadavji Trikamji, Published by Chaukhamba Surbharati Prakashan,Varanasi, reprint edition 2021, Sutrasthana, Chapter 20, Shloka No. 11, 113.
3. Acharya Agnivesha-Charaka Samhita of Agnivesha with Ayurveda Deepika commentary of Sri Chakrapanidatta, Edited by VaidyaYadavji Trikamji, Published by Chaukhamba Surbharati Prakashan, Varanasi, reprint edition 2021, Chikitsasthana, Chapter 28, Shloka No. 56-57, 619.
4. Acharya Sushrutha - Sushrutha Samhitha with Nibandhasangraha commentary of Sri Dalhana Acharya and Nyayacandrika Panjika of Sri Gayadasacarya, edited by Vaidya Yadavji Trikamji Acharya, Pub: Chaukhamba Sanskrit Santhan Varanasi, Edition 2019, Nidana Sthana: Chapter 1, Shloka No. 74: 268
5. Acharya Harita- Harita Samhita-Sanskrit Moola with ‘Nirmala’ Hindi Teeka, Edited and Translated By- Vaidya Jayamani Panday, Published By Chaukhambha Vishwabharti, Varanasi, Edition 2013, Trityasthana, Chapter 22, Shloka No. 2, 380.
6. Acharya Agnivesha-Charaka Samhita of Agnivesha with Ayurveda Deepika commentary of Sri Chakrapanidatta, Edited by VaidyaYadavji Trikamji, Published by Chaukhamba Surbharati Prakashan,Varanasi, reprint edition 2021, Sutrasthana, Chapter 20, Shloka No. 13: 114.