

Evaluation of Add on Efficacy of Agni Karma with Siravyadha in Pain Management of Gridhrasi W.S.R to Sciatica-A Randomized Comparative Clinical Study

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ABSTRACT

Background: 3.8% in the working population and 7.9% of the total population suffers from Sciatica. The Modern conservative treatments give short-term pain reduction with mild to serious side effects. *Anushalya karma* (Para surgical procedures) are been practiced as *Atyayikachikitsa* (Emergency care) for the pain management. *Gridhrasi* (Sciatica) was described in Ayurveda as *Rujapradhana* (Pain predominant) under *Vataja Nanatmaja vyadhis* (Diseases caused by Vatadosha). **Objectives:** To evaluate adding on efficacy of *Agnikarma* (Cauterization therapy) with *Siravyadha* (Blood letting therapy) and *Siravyadha* (Alone) in pain management of *Gridhrasi* with special reference to sciatica. **Materials and Methods:** 40 subjects diagnosed with sciatica after fulfilling the inclusion criteria were enrolled in the study. The procedures were performed for once after obtaining informed consent according to the randomized groups i.e. Control group (*Siravyadha*) and Interventional group (*Siravyadha* followed by *Agnikarma*). The pain assessment parameters i.e. VAS (Visual Analogue Scale)/Wong-baker face rating scale, VDS (Verbal Descriptive Scale), FLACC (Face Leg Activity Cry Consolability) scale, SLR (Straight Leg Raising) test along with classical *Iakshanas* of *Gridhrasi* i.e., *Stamba* (Stiffness), *Ruja* (Pain), *Toda* (Pricking pain), *Spandana* (Pulsating sensation), *Sakti utkshepanani grahanthi* (Difficulty to lift the limbs with pain) and *Sandhi Spurana* (Pulsation in joints) were assessed from baseline and at different time points. **Results:** The add on therapy i.e. *Agnikarma* with *Siravyadha* have showed significant results (within and in between group) in parameters like pain (with p value <0.01 .) and other classical symptoms like *Stamba*, *Ruja*, *Toda*, *Spandana*, *Sakti utkshepanani grahanthi* and *Sandhi Spurana* with p value <0.01 , when compared with *Siravyadha* alone from baseline and at various time points. **Conclusion:** *Agnikarma* followed with *Siravyadha* is found more effective than the *Siravyadha* alone in the management of *Gridhrasi*.

Keywords: *Gridhrasi*, *Sciatica*, *Anushalya karma*, *Atyayika Chikitsa*, *Siravyadha*, *Agnikarma*, Pain management.

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INTRODUCTION

The newer lifestyle and the work patterns are putting tension on the standard health of a person. The

predisposing factors, like sedentary works, overexertion, heavy weight lifting, jerky movements while travelling, etc results in low backache.^[1] *Gridhrasi* has a common trait of radiating pain from the *Sphik* (lower back) to the *Paada* (foot), which has been linked to Sciatica in modern science, with symptomatology of lower backache with radiating pain from the lower back to the posterior aspect of the lower limb.^[2,3] Sciatica affects 3.8% of the Indian working population and 7.9% of the general population,^[4] with the age range

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of 40 to 50 years having the highest prevalence rate and females being more affected than males.^[5] The Modern Sciatica management strictly rely 90% on conservative treatment like non-steroidal-anti-inflammatory and in advanced cases surgical procedures like Discectomy, Laminectomy.^[3] Surgical management is beneficial in treating of Sciatica, however the recurrence rate of back pain was 54.17 %.^[6,7]

Ayurveda denotes *Gridhrasi* as *Ruja pradhana vata vyadhi* (Pain predominant vata dosha disorders) with its characteristic feature of radiating pain from *sphik* to *paada*. Ayurveda has classified Gridhrasi as Vataja and Vata-kaphaja. The *chikitsa* (Treatment) includes *Bheshaja* (medicine), *Basti* (Enema), *Swedana* (Fomentation), *Snehana* (Oilation therapy), *Shodhana* (Purification therapy), *Siravyadha* and *Agnikarma*.^[8,9] The current day aims for speedy pain alleviation in order to resume daily routine. *Anushalya karmas* are found to be more effective in relieving severe pain, this establishes the significance of *Anushalya karmas* in the treatment of *Gridhrasi* and *Vataja* diseases.^[10-12] Independently, *Siravyadha* and *Agnikarma* has proven the clinical efficacy in the management of *Gridhrasi* with a short pain free duration.^[3] To overcome this we made an effort to evaluate the efficacy of *Agnikarma* with *Siravyadha* as explained by Acharya Cakradatta and Yogaratnakara over a group of patients treated with *Siravyadha* alone.^[13,14]

MATERIALS AND METHODS

The patients diagnosed with sciatica were recruited from the OPD and IPD of KAHER's Shri B.M.K Ayurveda Hospital and Medical Research Centre, Belagavi. The present study followed CONSORT statement standards for reporting the outcomes of the study.^[15] The study was approved by the institutional ethical committee with ethical clearance number of BMK/19/PG/ST/5 and CTRI Registration Number-CTRI/2020/08/027473.

Research Design

The study was randomized comparative clinical trial and the subjects were distributed randomly into two groups by computer generated random numbers. The patients allocated to control and trial groups in a 1:1 ratio. CONSORT flow diagram of the study is provided in Figure 1.

Subjects

40 Subjects of Gridhrasi (Sciatica), irrespective of sex, caste, occupation and socio-economic status were recruited from the OPD and IPD department of Kayachikitsa, Panchakarma and Shalyatantra of

KAHER's Shri B M K Ayurveda Hospital and Research Centre, Belagavi.

Inclusion Criteria

Subjects with classical features of *Gridhrasi*, irrespective of sex and age between 20-60 years and the *Yogya* (fit for the therapy) for *Siravyadha*^[16,17] and *Agnikarma*^[18,19] with normal CT, BT and Hb% were included in the study.

Exclusion Criteria

Subjects *Ayogya* (contraindicated) for *Siravyadha*^[20] and *Agnikarma*,^[18,19] with History of spinal tuberculosis/lesion/injury, HIV I and II, HbsAG infections, severe anaemia or any other chronic illness (like Diabetes, Hypertension) pregnancy and Known case of bleeding disorders were excluded from the study.

Ayogya for *Siravyadha-Sarvangasopha* (generalized swelling), *kshina* (Emaciated), *Pandu* (Anaemia), *Arsha* (Haemorrhoids), *Udara* (Ascitis), *Garbhini* (pregnant), *Baala* (Children), *Vrudha* (aged people) and patients with *Jvara* (fever), *Kasa* (cough), *Swasa* (dyspnoea) etc.

Screening methods

40 Patients diagnosed with Gridhrasi were enrolled according to research proforma prepared for the study. The 45 patients with positive SLR test and classical lakshanas of Gridhrasi were included in screening procedure. The 40 subjects coming under the inclusion criteria were enrolled in the study.

Interventions

40 subjects were randomly divided into two groups, Group A- *Siravyadha* (Control group) and Group B- *Siravyadha* followed by *Agnikarma* (Interventional group). The procedure was done only for 1 sitting based on the randomization chart. The informed consent was taken from each patient after explaining the study in detail. The Institutional ethics committee approval was obtained for the study. The subject enrollment and data collection were done from the period of April 2021 to January 2022. The subjects were instructed to approach the investigator to report any adverse events during the study period.

Group A-Siravyadha

Pre-operatively the *Abhyanga* (Massage) over lower back and lower limbs followed by *Swedana* (Fomentation) and *Snigdhasavagupana* (medicated sweet preparation) was carried out. The *Siravyadha* was done with 18 gauge needle under aseptic measures after painting (with povidine iodine solution) and draping of the part. The drained blood (100-150 ml) was disposed under NABH guidelines. i.e., Mixed with sodium hypochloride for

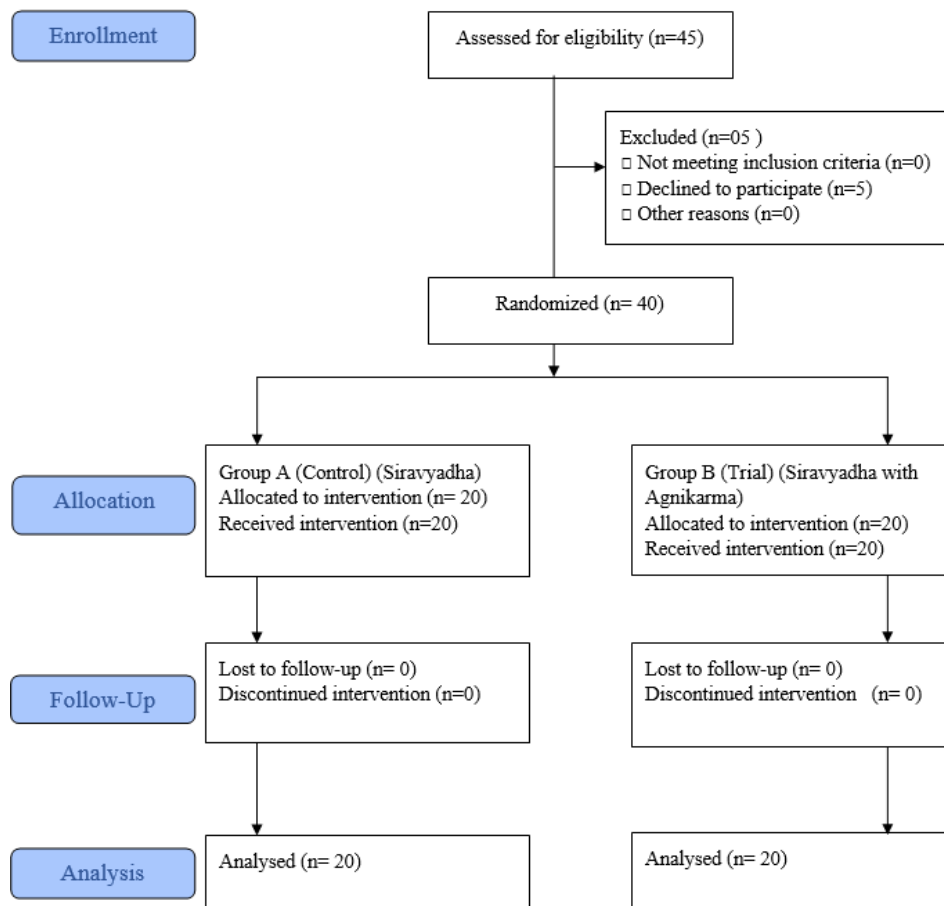


Figure 1: Consort chart.

15 min and disposed in yellow colored bag. The part bandaged tightly with application of *Haridrachoorana*. The foot end elevation provided for 10-15 min. Figures 2 and 3.

Group B-Siravyadha with Agnikarma

The *Siravyadha* was done with the same procedure. The *Agnikarma* was done after 10-15 min after *Siravyadha* procedure. The foot of the same limb (*Siravyadha* was done) was massaged and *Agnikarma* was done with Thermoregulated Agnikarma instrument (Cautery instrument) at *paadakanishtika* (little toe). The *Agnikarma* wound care done with application of Shatadhouta ghruta (Medicated ghee). Figure 2 and 4.

Criteria for assessment

Primary outcomes

The pain was assessed by VAS,^[21] VDS^[22] and FLACC^[23] Scale from baseline, immediately after treatment, 1st hr, 3rd hr, 6th hr, 12th hr and 24th hr of the treatment.

Secondary outcome

The improvement in SLR test was assessed by Goniometry along with classical *lakshanas* of *Gridhrasi* like *Stamba*, *Ruja*, *Toda*, *Spandana*, *Sakti utkshepanani grabanthi* and *Sandhi Spurana* were assessed by grading system from baseline and after treatment (after 24th hr).

Statistical Test

Statistical analysis was done by using SPSS version 20.0. The Results (within the groups) of parameters like VAS, VDS, FLACC scale, *Stamba*, *Ruja*, *Toda*, *Spandana*, *Sakti utkshepanani grabanthi* and *Sandhi Spurana* were assessed by using Wilcoxon matched pairs test. The Mann Whitney U tests were used to compare the two groups at different time points for the above assessment parameters. The statistical analysis of SLR test was performed with independent 't' test to compare the groups and dependent 't' test for within the group evaluation.



Figure 2: Materials used for the study.



Figure 3: Siravyadha procedure.

RESULTS

Total 40 subjects were screened and enrolled for the study without any dropout. No any adverse events were reported during the study period.

Subject Characteristics

Age-The maximum were spotted in the age group of 51-60 years (42.50%) and minimum at age group of 41-50 (27.50%) out of 40 subjects.

Gender-In consideration of gender 55% were male and females of 45% i.e. Group A (10:10) and Group B (12:08).

Occupation-The majority of patients were found in the group of Housewives (30%). The business categories were 25%, farmers were 22.5% and other categories included 22.5%.

Primary Outcome

Within the Groups results were significant statistically with p value of 0.0001 in both the groups in concern to assessment parameters like VAS, VDS and FLACC Scale at before treatment, immediately after treatment, 1st hr, 3rd hr, 6th hr, 12th hr and 24th hr of treatment. The Comparison of two groups by results were found Group B is comparable with Group A with p value <0.05



Figure 4: Siravyadha with agnikarma procedure.

in concern to assessment parameters like VAS, VDS, FLACC Scale at before treatment, immediately after treatment, 1st hr, 3rd hr, 6th hr, 12th hr and 24th hr of treatment. Percentage-wise Group B has showed marked improvements than Group A in parameters like SLR (Group B-93.75% and Group A-40.44%), VAS (Group B-82.18% and Group A-39.13%), VDS (Group B-81.87% and Group A-38.31%), FLACC Scale (Group B-90.00% and Group A-46.05%). Table 1.

Secondary outcome

Within the Groups results were significant statistically with p value of 0.0001 in both the groups in concern to assessment parameters like SLR test (before treatment, immediately after treatment, 1st hr, 3rd hr, 6th hr, 12th hr and 24th hr of treatment) and the classical lakshnas of *Gridhrasi* like *Stamba*, *Ruja*, *Toda*, *Spandana*, *Sakti utkshapanani grabanhti* and *Sandhi Spurana* (before and

24th hr of treatment). The two groups are comparable in relation to assessment parameters like SLR test (before treatment, immediately after treatment, 1st hr, 3rd hr, 6th hr, 12th hr and 24th hr of treatment), *Stamba*, *Ruja*, *Toda*, *Spandana*, *Sakti utkshapanani grabanhti* and *Sandhi Spurana* (before and 24th hr of treatment). Tables 2 and 3.

DISCUSSION

Sciatica is characterised by acute shooting pain as a result of persistent nerve stimulation. The quick impact of analgesics such as NSAIDS, corticosteroids and muscle relaxants makes the patient to seek contemporary treatment as first line of management. The analgesics and other medications assure a short period of pain relief and chronic usage results in mild to severe systemic illness.^[24] *Acharya Susbruta* underlines the importance and superiority of *Anusastrakarmas* (*Siravyadha* and *Agnikarma*)

Table 1: Comparison of Group A and Group B scores at different treatment time points by Mann-Whitney U test.

Parameters	Treatment times	Group A			Group B			U-value	Z-value	p-value
		Mean	SD	Mean rank	Mean	SD	Mean rank			
VAS	Before	8.05	0.94	17.03	8.70	1.08	23.98	130.50	-1.8665	0.0620
	Immediate	6.35	0.88	21.05	6.20	1.32	19.95	189.00	0.2840	0.7764
	1 hr	6.00	0.97	25.20	5.00	1.08	15.80	106.00	2.5292	0.0114*
	3 hr	5.25	0.97	25.23	4.25	1.16	15.78	105.50	2.5427	0.0110*
	6 hr	4.85	0.81	28.43	3.00	1.17	12.58	41.50	4.2739	0.0001*
	12 hr	4.85	0.93	30.05	1.90	0.91	10.95	9.00	5.1530	0.0001*
	24 hr	4.90	1.02	30.28	1.55	0.83	10.73	4.50	5.2748	0.0001*
VDS	Before	7.70	1.22	16.68	8.55	1.23	24.33	120.50	-2.0001	0.0598
	Immediate	6.15	1.09	20.45	6.05	1.43	20.55	199.00	-0.0135	0.9892
	1 hr	5.85	1.14	24.40	4.85	1.23	16.60	122.00	2.0964	0.0360*
	3 hr	5.15	1.18	24.78	3.95	1.47	16.23	114.50	2.2993	0.0215*
	6 hr	4.75	0.91	28.15	2.90	1.25	12.85	47.00	4.1251	0.0001*
	12 hr	4.75	1.07	29.98	1.80	0.95	11.03	10.50	5.1125	0.0001*
	24 hr	4.75	1.07	30.23	1.55	0.83	10.78	5.50	5.2477	0.0001*
FLACC	Before	3.80	1.47	16.75	5.00	1.97	24.25	125.00	-2.0152	0.0439
	Immediate	3.30	1.22	20.13	3.50	1.57	20.88	192.50	-0.1894	0.8498
	1 hr	2.45	1.28	19.28	2.65	1.14	21.73	175.50	-0.6492	0.5162
	3 hr	2.30	1.13	22.65	1.90	1.29	18.35	157.00	1.1496	0.2503
	6 hr	2.00	1.03	24.85	1.15	1.04	16.15	113.00	2.3398	0.0193*
	12 hr	1.90	0.97	27.08	0.65	0.81	13.93	68.50	3.5436	0.0004*
	24 hr	2.05	1.05	28.25	0.50	0.69	12.75	45.00	4.1792	0.0001*
Comparison of different treatment time points scores in Group A and Group B by Wilcoxon matched pairs test										
	Groups	Changes from	Mean Diff.	SD Diff.	% of change	Z-value	p-value			
VAS	Group A	Before-immediate	1.70	0.73	21.12	3.7236	0.0002*			
		Before-1 hr	2.05	0.94	25.47	3.8230	0.0001*			
		Before-3 hr	2.80	1.01	34.78	3.9199	0.0001*			
		Before-6 hr	3.20	1.06	39.75	3.9199	0.0001*			
		Before-12 hr	3.20	1.54	39.75	3.8230	0.0001*			
	Group B	Before-24 hr	3.15	1.60	39.13	3.8230	0.0001*			
		Before-immediate	2.50	0.69	28.74	3.9197	0.0001*			
		Before-1 hr	3.70	0.86	42.53	3.9198	0.0001*			
		Before-3 hr	4.45	0.83	51.15	3.9199	0.0001*			
		Before-6 hr	5.70	1.03	65.52	3.9199	0.0001*			
VDS	Group A	Before-12 hr	6.80	1.32	78.16	3.9201	0.0001*			
		Before-24 hr	7.15	1.27	82.18	3.9209	0.0001*			
		Before-immediate	1.55	0.69	20.13	3.7236	0.0002*			
		Before-1 hr	1.85	0.88	24.03	3.8230	0.0001*			
		Before-3 hr	2.55	0.94	33.12	3.9199	0.0001*			
	Group B	Before-6 hr	2.95	1.10	38.31	3.9199	0.0001*			
		Before-12 hr	2.95	1.64	38.31	3.8230	0.0001*			
		Before-24 hr	2.95	1.64	38.31	3.8230	0.0001*			
		Before-immediate	2.50	0.69	29.24	3.9197	0.0001*			

FLACC	Group A	Before-1 hr	3.70	0.98	43.27	3.9198	0.0001*
		Before-3 hr	4.60	0.99	53.80	3.9199	0.0001*
		Before-6 hr	5.65	1.14	66.08	3.9199	0.0001*
		Before-12 hr	6.75	1.41	78.95	3.9201	0.0001*
		Before-24 hr	7.00	1.38	81.87	3.9209	0.0001*
		Before-immediate	0.50	0.69	13.16	2.4450	0.0145*
		Before-1 hr	1.35	0.81	35.53	3.6214	0.0003*
		Before-3 hr	1.50	1.00	39.47	3.5162	0.0004*
	Group B	Before-6 hr	1.80	1.24	47.37	3.5162	0.0004*
		Before-12 hr	1.90	1.33	50.00	3.5162	0.0004*
		Before-24 hr	1.75	1.37	46.05	3.4078	0.0007*
		Before-immediate	1.50	0.95	30.00	3.5162	0.0004*
		Before-1 hr	2.35	1.46	47.00	3.7236	0.0002
		Before-3 hr	3.10	1.45	62.00	3.9199	0.0001*
		Before-6 hr	3.85	1.53	77.00	3.9199	0.0001*
		Before-12 hr	4.35	1.87	87.00	3.9201	0.0001*
Before-24 hr	4.50	1.93	90.00	3.9209	0.0001*		

Table 2: Comparison of Group A and Group B with SLR scores at different treatment time points by independent t test.

Treatment times	Mean	Group A		Group B		t-value	p-value
		Std.Dev.	Mean	Std.Dev.	Mean		
Before		41.30	9.13	36.00	8.37	1.9145	0.0631
Immediate		50.50	5.36	52.50	6.18	-1.0940	0.2808
1 hr		55.50	7.59	59.00	5.28	-1.6925	0.0987
3 hr		57.50	6.59	68.00	8.34	-4.4194	0.0001*
6 hr		57.50	6.59	69.75	8.03	-5.2757	0.0001*
12 hr		58.00	6.37	69.75	8.03	-5.1297	0.0001*
24 hr		58.00	6.37	69.75	8.03	-5.1297	0.0001*

Comparison of different treatment time points with SLR scores in Group A and Group B by dependent t test								
Groups	Time points	Mean	SD	Mean Diff.	SD Diff.	% of change	t-value	p-value
Group A	Before	41.30	9.13					
	Immediate	50.50	5.36	-9.20	6.21	-22.28	-6.6232	0.0001*
	1 hr	55.50	7.59	-14.20	10.24	-34.38	-6.2002	0.0001*
	3 hr	57.50	6.59	-16.20	10.58	-39.23	-6.8470	0.0001*
	6 hr	57.50	6.59	-16.20	9.94	-39.23	-7.2887	0.0001*
	12 hr	58.00	6.37	-16.70	10.13	-40.44	-7.3755	0.0001*
	24 hr	58.00	6.37	-16.70	10.13	-40.44	-7.3755	0.0001*
Group B	Before	36.00	8.37					
	Immediate	52.50	6.18	-16.50	9.05	-45.83	-8.1566	0.0001*
	1 hr	59.00	5.28	-23.00	9.23	-63.89	-11.1394	0.0001*
	3 hr	68.00	8.34	-32.00	11.17	-88.89	-12.8135	0.0001*
	6 hr	69.75	8.03	-33.75	11.46	-93.75	-13.1747	0.0001*
	12 hr	69.75	8.03	-33.75	11.46	-93.75	-13.1747	0.0001*
	24 hr	69.75	8.03	-33.75	11.46	-93.75	-13.1747	0.0001*

Table 3: Comparison of Group A and Group B with before and after treatment scores by Mann-Whitney U test.

	Treatment times	Group A			Group B			U-value	Z-value	p-value
		Mean	SD	Mean rank	Mean	SD	Mean rank			
STAMBA	Before	1.80	0.41	20.00	1.85	0.37	21.00	190.00	-0.2570	0.7972
	After	0.90	0.31	27.50	0.20	0.41	13.50	60.00	3.7735	0.0002*
RUJA	Before	1.90	0.31	20.50	1.90	0.31	20.50	200.00	0.0000	1.0000
	After	1.00	0.32	29.05	0.10	0.31	11.95	29.00	4.6120	0.0001*
TODA	Before	1.55	0.51	19.50	1.65	0.49	21.50	180.00	-0.5275	0.5979
	After	0.70	0.47	26.50	0.10	0.31	14.50	80.00	3.2325	0.0012*
SPANDANA	Before	1.20	0.70	17.30	1.60	0.60	23.70	136.00	-1.7177	0.0859
	After	0.35	0.49	22.50	0.15	0.37	18.50	160.00	1.0685	0.2853
SAKTIKSHEPANA NIGRAHANTHI	Before	1.75	0.44	19.63	1.80	0.52	21.38	182.50	-0.4599	0.6456
	After	0.85	0.37	27.50	0.15	0.37	13.50	60.00	3.7735	0.0002*
SANDHI SPHURANA	Before	1.25	0.72	20.03	1.35	0.49	20.98	190.50	-0.2435	0.8077
	After	0.40	0.50	24.50	0.00	0.00	16.50	120.00	2.1505	0.0315*
Comparison of before and after treatment scores in Group A and Group B by Wilcoxon matched pairs test										
	Groups	Changes from	Mean Diff.	SD Diff.	% of change	Z-value	p-value			
STAMBA	Group A	Before-after	0.90	0.45	50.00	3.6214	0.0003*			
	Group B	Before-after	1.65	0.49	89.19	3.9199	0.0001*			
RUJA	Group A	Before-after	0.90	0.45	47.37	3.6214	0.0003*			
	Group B	Before-after	1.80	0.41	94.74	3.9199	0.0001*			
TODA	Group A	Before-after	0.85	0.49	54.84	3.5162	0.0004*			
	Group B	Before-after	1.55	0.60	93.94	3.8230	0.0001*			
SPANDANA	Group A	Before-after	0.85	0.49	70.83	3.5162	0.0004*			
	Group B	Before-after	1.45	0.60	90.63	3.8230	0.0001*			
SAKTIKSHEPANA NIGRAHANTHI	Group A	Before-after	0.90	0.64	51.43	3.4078	0.0007*			
	Group B	Before-after	1.65	0.59	91.67	3.8230	0.0001*			
SANDHI SPHURANA	Group A	Before-after	0.85	0.49	68.00	3.5162	0.0004*			
	Group B	Before-after	1.35	0.49	100.00	3.9199	0.0001*			

in the pain management of *Gridhrasi*.^[25] *Acharaya Chakradatta* and *Yogarajna* highlighted the add-on therapy of *Siravyadha* followed by *Agnikarma* in treating *Gridhrasi*.^[13,14]

Pain- Significant reduction of pain was observed with *p* value 0.0001 in both the groups with assessment parameters like VAS, VDS and FLACC. *Siravyadha* helps to remove the *Avarana*, *does Vata anulomana* (Relieves vata dosha) and act as *Srotosodbhaka* (Clearance of pathways in body) thus helps in the pain management.^[28] Removal of congested blood from the site of nerve compression will reduce the pressure around the nerves thus helps in relieving the pain.^[29] Outflow of stasis blood improves the local circulation and reduces the concentration of pain-producing chemicals in

the circulation, further aids in the restoration of injured tissue as well as blocking the pain pathway.^[29] *Ushnaguna* (Hot potency) produced by *Agnikarma* helps in alleviating *Vata Dosha* as well as *Kapha Dosha* thus helps in reduction of pain.^[30] Thermal energy delivered by *Agnikarma* acts at the level of myelinated nerve fibers with large diameter (A beta fibers) and does the inhibition of signals from the unmyelinated nerve fibers with small diameter (C fibers) leading to closure or blocking of the physiological gate of pain.^[31,32] Research studies proved that application of therapeutic heat initiates an inflammatory condition at the site leading to increased blood circulation to that area and reduces the metabolic factors responsible for pain.^[33]

SLR test-*Siravyadha* acts as *Vatanulomaka* and removes margavarana (*Kaphaavrutavata*). The *Ushna*, *Tikshna* (*Sharp*), *Sukshma* (small) *guna* (property) of *Agnikarma* acts as an added efficacy in breaking the *Aavarana* (Obstruction) and it restores the normal *gati* (Direction) of *Vata* thus improving the movements of joints by reducing the pain.^[33]

Classical lakshanas (Symptoms) of Gridhrasi

Stamba-The probable reason for muscle stiffness is postulated as altered neuromuscular control.^[31] The pain is generated due to the increase in pain producing substances in the extracellular fluid (Inflammatory soup) at affected area. *Siravyadha* helps in removing the of extracellular fluid with inflammatory soup, the relieves the pain with muscle stiffness.^[33] Along with this there is added effect of *Agnikarma* i.e. the local therapeutic heat relieves pain and muscle spasm by producing vasodilatory effect thus evacuating the stasis and enhancing local blood circulation.^[31]

Spandana and *Sandhi spurana*-Significant result was observed with *p* value <0.0005. The therapeutic heat acts over *Dhatwagni* (Digestive power) and digests the *Amadosha* present at the affected area. This process makes *Uttarothara Dhatuposhana* (metabolism). Thus *Asthi* (Bones) and *Majjadhatu* (Bone marrow) becomes more stable and patient gets relief from *Spandana* and *Sandhi spurana*.^[32]

A recent case study on *Gradhrasi* treated with *Agnikarma* has shown the reduction of pain assessed by VAS from 6 to 4 after 24 hr,^[33] but in the present study *siravyadha* followed with *Agnikarma* has shown reduction of pain (VAS) from 8 to 1.55 after 24 hr. Previous study conducted on *gradhrasi* showed that pain reduction by *Agnikarma* from baseline to 16th day was 3.65 (Severe pain) to 1.80 (Trivial pain) and *siravyadha* was 3.85 (Severe pain) to 1.85 (Trivial pain) respectively.^[34] In the present study the combined treatment i.e. *Siravyadha* followed with *Agnikarma* has given better results.

According to the symptoms, the *brahatryis* advise using either *Agnikarma* or *Siravyadha* as an *upakrama*; however, the *laghutryis* advise using both in the same situation. *Agnikarma* as adding on efficacy after *siravyadha* has given significant results in the pain management of sciatica (*Gradhrasi*). In order to provide comprehensive care for *Gradhrasi*, the same can be used as an *Aatyayika chikitsa* (symptom modifying). Later, further therapies like *panchakarma* or *Shamana oushadis* can be scheduled as disease modifying treatments. The present treatment helps in the immediate pain management and helps

the clinicians to get quick results, further the treatment plan can be helpful in making the treatment protocols, policies with incorporating larger sample size and longer follow up period.

Strength of the study

The study is a randomised clinical trial, standard assessment parameters were used to analyze the study outcome. Standard statistical analysis was applied to draw the results. The treatment protocols were performed by developing standard operative procedures as per NABH guidelines. *Agnikarma* as adding on efficacy after *siravyadha* has given significant results in the pain management of sciatica (*Gradhrasi*).

Limitations

The sample size for the present study was taken less due to time constraint, patient availability, patient acceptability for invasive procedures. The treatment adopted was limited to symptomatic pain management, but not disease modifying.

CONCLUSION

The *Agnikarma* with *Siravyadha* found effective in parameters like VAS, VDS, FLACC, SLR test, *Stamba*, *Ruja*, *Toda*, *Spandana*, *Sakti utkshapanani grabanthe* and *Sandhi Spurana* (Within and Between groups results). *Anusastra karmas* can be practiced as *Aatyayikachikitsa* in the acute pain management. The study can be further continued with more sittings and follow-up to see the efficacy to provide evidence based results.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

SUMMARY

Gridhrasi is a very common clinical condition encountered during clinical practice. The common feature of *Gridhrasi* is radiating pain from *spbik* to *pada*, through which we can correlate *Gridhrasi* with Sciatica in modern science. It is estimated that about 60% to 80% of world's population experience back pain at some time in their lives. It is generally accepted that 90% of acute episodes

of low back pain settle, allowing return to work within 6 weeks. According to modern science, in 90% cases of Sciatica can be managed by conservative treatments with analgesia and early mobilization. In Ayurvedic literature the treatment for *Gridhrasi* explained as *Snehana*, *Svedana*, *Sodbhana*, *Basti*, *Siravyadha* and *Agnikarma*. In this *Siravyadha* and *Agnikarma* can be considered as *Athyayika chikitsa* for pain management. Considering both the treatment the study was conducted with 40 subjects with the incorporation of standard assessment parameters and statistical tests. Significant results were seen in all the parameters like VAS, VDS, FLACC Scale which were assessed at different time points. *Agnikarma* as an add on efficacy can be practiced in the management of *Gridhrasi*.

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