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To evaluate the efficacy of *Agnikarma* after *Siravyadhana* in Pain Management of *Gridhrasi* w.s.r. to *Sciatica*: A Randomized Controlled Clinical Trial

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ABSTRACT

Gridhrasi, a *Vataj Nanatmaja Vyadhi*, is characterized by pain (*Ruka*), pricking sensation (*Toda*), stiffness (*Stambha*), and twitching (*Muhuspandana*) that radiate from the *Sphika* up to the *Pada*. This condition corresponds to sciatica in modern medicine. *Acharya Shodhala* in *Gadanigraha* recommends *Agnikarma* as an additional therapy if *Siravyadhana* alone fails to relieve the pain. Although both treatments are effective individually, their combined efficacy has not been explored. A study was conducted with 40 patients randomly divided into two groups of 20 each at SJGAUH Hospital. In Group A, *Siravyadhana* was performed at 4 *Angula* above or below *Janusandhi* using an 18G needle. In Group B, *Siravyadhana* followed by *Ruksha Agnikarma* (*Bindu Akriti*) at the *Padakanisthika* region using a *Panchadhatu Shalaka*. Treatment outcomes were evaluated based on parameters recorded before and after the interventions. The results showed significant improvement in both groups, but Group B demonstrated faster recovery, fewer recurrences, and more complete relief compared to Group A. Thus, the combination of *Siravyadhana* and *Agnikarma* provides an added advantage in managing *Gridhrasi*, offering faster and sustained relief, and aligns with *Atyayika Chikitsasutra*.

Key words: *Gridhrasi*, *Siravyadhana*, *Agnikarma*, *Sciatica*, *Panchadhatu Shalaka*, *Bloodletting*, *Lower back pain*, *Radiating leg pain*, *Thermal microcautery*

INTRODUCTION

Gridhrasi is a condition mentioned in all *Brihatrayees* and is included under 80 types of *Vataj Nanatmaja Vyadhi*. *Vatavyadhi* mentioned under *Astamahagada* so, *Grudhrasi* can be included in it. *Gridhrasi* consist of features like *Ruk*, *Toda*, *Stambha*, *Spandana* over *Sphik*, *Kati*, *Prishta*, *Uru*, *Janu*, *Jangha* extending up to

Pada in the same sequential order along with *Sakti Kshepanigraha*.^[1,2]

On the basis of symptoms, disease can be correlated with *Sciatica* in the contemporary science which is caused by the impingement of L4, L5 or S1 nerve and manifests as neuropathic pain extending from the gluteal region down the posterolateral leg to the foot. *Sciatica* is a relatively common condition with a lifetime incidence varies from 10 to 40% while the annual incidence of an episode of *sciatica* ranges between 1% - 5%. Peak incidence occurs in patient from 5th to 6th decade.^[3]

Risk factor involves strenuous physical activity like heavy weight lifting, driving vehicle for long periods, improper sitting and sleeping postures. Conservative management of *sciatica* includes administration of NSAIDS, muscle relaxant and corticosteroids which gives temporary relief. In some cases, if nerve compression is more, surgical procedure like Laminectomy, discectomy is indicated but this surgical

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procedure which are quite expensive with their limitations.^[4]

Ayurvedic management of Gridhrasi includes treatment as:

Bheshaj, Snehana, Swedana, Siravyadhana, Basti and Agnikarma. As *Aacharya Sushruta* mentioned *Siravyadhana* and *Agnikarma* as *Atyayika Chikitsa*. *Siravyadha* is accepted as *Ardhachikitsa* in *Shalyatantra* like *Basti* in *Kayachikitsa*. It is one among *panchakarma* and one of the most commonly preferred procedure. As *Gridhrasi* is *Aavaranajanya Vyadhi*, *Siravyadhana* helps to remove *Srotoavarodha*. Also, there is involvement of *Dusyakandara* in the pathogenesis of *Gridhrasi* as *Kandara* is *Upadhatu of Rakta*. So, *Siravyadhana* removes *Dushita Rakta*. References show that the diseases treated with *Agnikarma* do not recur.^[5]

Aacharya Shodhalakrita Gadanigraha and *Chakradatta* mentioned *Siravyadhana* followed by *Agnikarma* with *Panchadhatu Shalaka* in the contest of *Gridhrasi*. *Bindu Aakriti Ruksha Agnikarma at padakanisthika*, following *Siravyadhana*, effectively relieves pain, especially in cases of *Atiugra ruja*. *Ruk* and *Stambha*, the predominant symptoms of *Gridhrasi* which disturbs the normal routine of the patient are effectively relieved by the *Agnikarma*.^[6,7] As *Agni* possess *Usna, Tikshna, Sukshma, Aashukari Guna* which are opposite to *Vata* and *Kapha*. Based on this understanding, the present study investigates the combined effects of these two procedures, following the principles of *Atyayika Chikitsa* as described by the *Acharyas*.^[8,9]

AIM

To evaluate the efficacy of *Agnikarma* after *Siravyadhana* in pain management of *Gridhrasi* w.s.r. to *Sciatica*: A Randomized Controlled Clinical Trial.

OBJECTIVES

- To evaluate the efficacy of *Agnikarma* after *Siravyadhana* in the pain management of *Gridhrasi* w.s.r. to *sciatica*.
- To evaluate the efficacy of *Siravyadhana* in the pain management of *Gridhrasi* w.s.r. to *sciatica*.

- To compare the results of both the groups to ascertain the efficacy of *Agnikarma* after *Siravyadhana* in comparison to *Siravyadhana*.

MATERIALS AND METHODS

The study was conducted during the period of September 2023 to 2024.

Method of Collection of Data

Total 40 Subjects with clinical features of *Ghridhrasi* w.s.r. to *Sciatica* fulfilled the inclusion criteria approaching the Out-Patient Department and In-Patient Department of *Shalyatantra* at *S.J.A.U.H. Bengaluru* were randomly selected for the study using method of simple random sampling.

Inclusion Criteria

- Selection of subject were done irrespective of sex, religion, occupation, economic and educational status.
- Subject with features of *Gridhrasi* namely *Ruk* (continuous pain), *Toda* (intermittent pricking pain), *Stambha* (stiffness), *Spandana* (twitching sensation) over *Sphik, Kati, Prishta, Uru, Janu, Jangha* extending up to *Pada*.^[1]
- Positive SLR test.
- Positive Bragard's test.
- Subject above 18 and below 70 years of age

Exclusion Criteria

- Subject with any systemic disorder which may interfere with the course of treatment
- Subject with history of fracture related to spine, Spinal tumour, tuberculosis of vertebra.
- Pregnant, lactating woman and children.

Study Design

Group: A (20 Subjects)	Group: B (20 Subjects)
<i>Siravyadhana</i>	<i>Siravyadhana</i> followed by <i>Agnikarma</i> .

Intervention

Group A - Siravyadhana

Poorvakarma

- Written informed consent of the patient was taken.
- Required materials i.e. tourniquet, measuring glass, sterile disposable gloves, needle no. 18g, kidney tray, surgical spirit, sterile gauze were collected.
- Sthanika Snehana* with *Murchita Taila* followed by *Sthanika Swedana* was done.
- Patient was advised to take *Yavagupana* 1 hour prior to the procedure.

Pradhanakarma

- The site of *Siravyadhana* was cleaned.
- The tourniquet was tied 4 *Angula* above the *Sira*.
- Siravyadhana* was done 4 *Angula* above or below the *Janusandhi*.^[10]
- A sterile disposable 18G needle with bevel facing upward was introduced into *Sira* and blood was collected in measuring glass.
- The tourniquet was released.
- The amount of blood was collected according to *Dehabala* of patient.

Paschatkarma

- The site of *Siravyadhana* was cleaned with sterile cotton.
- Haemostasis was achieved.
- Sterile tight bandaging was done.
- The patient was advised to elevate the limb.

Group B - Siravyadhana followed by Agnikarma

Poorvakarma

- The written informed consent was taken.
- Siravyadhana* was performed on the patient as mentioned, Once the patient was stable after *Siravyadhana*, *Agnikarma* was carried.

- Required materials: Sterile gauze, sterile disposable gloves, surgical spirit, sponge holding forceps, *Panchadhatu Shalaka*, *Ghrita*, *Madhu*.
- Patient was advised to lie down in prone position.

Pradhanakarma

- The *Panchadhatu Shalaka* was heated to red hot.
- Bindu Akriti Agnikarma* was performed with the red-hot *Shalaka* at *Padakanishtika* (lateral and ventral aspect of little toe) of the affected limb till appearance of *Samyaka Dagdha Lakshana*.

Paschatkarma

- Immediately after *Agnikarma*, *Madhu* and *Ghrita* were applied over the area.

Duration of Treatment

Duration of treatment was 1 day.

Subjective and Objective parameters were assessed before and after the treatment upto 5 days.

Assessment criteria

Subjective Parameter

Table 1: Grading for subjective parameters

Description	Grade
1. Ruk (Continuous pain)	
No Pain	0
Trivial pain	1
Mild pain	2
Moderate pain	3
Severe pain	4
2. Toda (Pricking Pain)	
No intermittent pricking pain	0
Sometimes for 5-10 minutes	1
Daily for 10-30 minutes	2
Daily for 30-60 minutes	3

Daily more than 1 hour	4
3. Stambha (Stiffness)	
No Stiffness	0
Stiffness for less than 15 min after sitting for long duration but relived by mild movement.	1
Stiffness more than 1 hour or more than once in a day but routine works are not disturbed.	2
Stiffness lasting for more than 1 hour many times a day mildly affecting the daily routine.	3
Episode of stiffness lasting 2-6 hour or daily routine hampered.	4
4. Spandana (Twitching sensation)	
No throbbing at all	0
For few minutes occasionally.	1
Daily once in a day for 10-15 minutes.	2
Many times in a day for few minutes.	3
Daily for many times Severely hampering daily routine.	4

Objective Parameter

Table 2: Grading for Objective parameters

Description	Grade
Straight Leg Raising Test - (between 30° to 70°)	
Above 70°	0
60 - 70°	1
50 - 60°	2
40 - 50°	3
30 - 40°	4

Bragard's Test	
Negative	0
Positive	1

RESULTS (Within Group)

1. Ruka

Ranks				
Groups		N	Mean Rank	Sum of Ranks
BT	Group A	20	18.50	370.00
	Group B	20	22.50	450.00
	Total	40		
H0	Group A	20	21.50	430.00
	Group B	20	19.50	390.00
	Total	40		
H6	Group A	20	20.85	417.00
	Group B	20	20.15	403.00
	Total	40		
H12	Group A	20	22.45	371.00
	Group B	20	18.55	449.00
	Total	40		
H24	Group A	20	21.05	421.00
	Group B	20	19.95	399.00
	Total	40		
D3	Group A	20	22.60	452.00
	Group B	20	18.40	368.00
	Total	40		
D5	Group A	20	22.00	440.00
	Group B	20	19.00	380.00

	Total	40					
Test Statistics ^a							
	BT	H0	H6	H12	H24	D3	D5
Mann-Whitney U	160.000	180.000	193.000	161.000	189.000	158.000	170.000
Wilcoxon W	370.000	390.000	403.000	371.000	399.000	368.000	380.000
Z	-1.255	-.624	-.220	-1.168	-.336	-1.424	-1.778
P value (2-tailed)	.209	.532	.826	.243	.737	.154	.075
a. Grouping Variable: Groups							
b. Not corrected for ties.							

	Total	40					
H12	Group A	20	21.50	430.00			
	Group B	20	19.50	390.00			
	Total	40					
H24	Group A	20	21.50	430.00			
	Group B	20	19.50	390.00			
	Total	40					
D3	Group A	20	22.00	420.00			
	Group B	20	20.00	400.00			
	Total	40					
D5	Group A	20	20.50	410.00			
	Group B	20	20.50	410.00			
	Total	40					
Test Statistics ^a							
	BT	H0	H6	H12	H24	D3	D5
Mann-Whitney U	159.000	191.000	180.000	180.000	180.000	190.000	200.000
Wilcoxon W	369.000	401.000	390.000	390.000	390.000	400.000	410.000
Z	-1.208	-.295	-.628	-.781	-1.041	-1.000	0.000
P value (2-tailed)	.227	.768	.530	.435	.298	.317	1.000
a. Grouping Variable: Groups							
b. Not corrected for ties.							

2. Toda

Ranks				
Groups		N	Mean Rank	Sum of Ranks
BT	Group A	20	18.45	369.00
	Group B	20	22.55	451.00
	Total	40		
H0	Group A	20	20.95	419.00
	Group B	20	20.05	401.00
	Total	40		
H6	Group A	20	19.50	390.00
	Group B	20	21.50	430.00

3. Stambha

Ranks							
Groups		N	Mean Rank	Sum of Ranks			
BT	Group A	20	20.15	403.00			
	Group B	20	20.85	417.00			
	Total	40					
H0	Group A	20	22.13	442.50			
	Group B	20	18.88	377.50			
	Total	40					
H6	Group A	20	21.28	425.50			
	Group B	20	19.73	394.50			
	Total	40					
H12	Group A	20	22.88	457.50			
	Group B	20	18.13	362.50			
	Total	40					
H24	Group A	20	21.88	437.50			
	Group B	20	19.13	382.50			
	Total	40					
D3	Group A	20	21.50	430.00			
	Group B	20	19.50	390.00			
	Total	40					
D5	Group A	20	22.00	440.00			
	Group B	20	19.00	380.00			
	Total	40					
Test Statistics ^a							
	BT	H0	H6	H12	H24	D3	D5
Mann-Whitney U	193.00	167.50	184.50	152.00	172.50	180.00	170.00

Wilcoxon W	403.00	377.50	394.50	362.50	382.50	390.00	380.00
Z	-.212	-.955	-.469	-1.512	-1.127	-1.433	-1.778
P value (2-tailed)	.832	.339	.639	.130	.260	.152	.075
a. Grouping Variable: Groups							
b. Not corrected for ties.							

4. Spandana

Ranks				
Groups		N	Mean Rank	Sum of Ranks
BT	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		
H0	Group A	20	21.25	425.00
	Group B	20	19.75	395.00
	Total	40		
H6	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		
H12	Group A	20	20.00	400.00
	Group B	20	21.00	420.00
	Total	40		
H24	Group A	20	19.50	390.00
	Group B	20	21.50	430.00
	Total	40		
D3	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		

D5	Group A	20	20.50	410.00			
	Group B	20	20.50	410.00			
	Total	40					
Test Statistics^a							
	BT	H0	H6	H12	H24	D3	D5
Mann-Whitney U	200.000	185.000	200.000	190.000	180.000	200.000	200.000
Wilcoxon W	410.000	395.000	410.000	400.000	390.000	410.000	410.000
Z	0.000	-.466	0.000	-.593	-1.433	0.000	0.000
P value (2-tailed)	1.000	.641	1.000	.553	.152	1.000	1.000
a. Grouping Variable: Groups							
b. Not corrected for ties.							

5. SLR Test

Ranks				
Groups		N	Mean Rank	Sum of Ranks
BT	Group A	20	19.00	380.00
	Group B	20	22.00	440.00
	Total	40		
H0	Group A	20	19.00	380.00
	Group B	20	22.00	440.00
	Total	40		
H6	Group A	20	22.10	442.00
	Group B	20	18.90	378.00
	Total	40		
H12	Group A	20	20.83	416.50
	Group B	20	20.18	403.50
	Total	40		
H24	Group A	20	22.25	445.00

	Group B	20	18.75	375.00			
	Total	40					
D3	Group A	20	22.10	442.00			
	Group B	20	18.90	378.00			
	Total	40					
D5	Group A	20	23.00	460.00			
	Group B	20	18.00	360.00			
	Total	40					
Test Statistics^a							
	BT	H0	H6	H12	H24	D3	D5
Mann-Whitney U	170.000	170.000	168.000	193.000	165.000	168.000	150.000
Wilcoxon W	380.000	380.000	378.000	403.000	375.000	378.000	360.000
Z	-.938	-.938	-1.075	-.215	-1.249	-1.114	-2.360
P value (2-tailed)	.348	.348	.282	.829	.212	.265	.018
a. Grouping Variable: Groups							
b. Not corrected for ties.							

6. Bragards Test

Ranks				
Groups		N	Mean Rank	Sum of Ranks
BT	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		
H0	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		

H6	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		
H12	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		
H24	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		
D3	Group A	20	23.50	470.00
	Group B	20	17.50	350.00
	Total	40		
D5	Group A	20	23.00	460.00
	Group B	20	18.00	360.00
	Total	40		

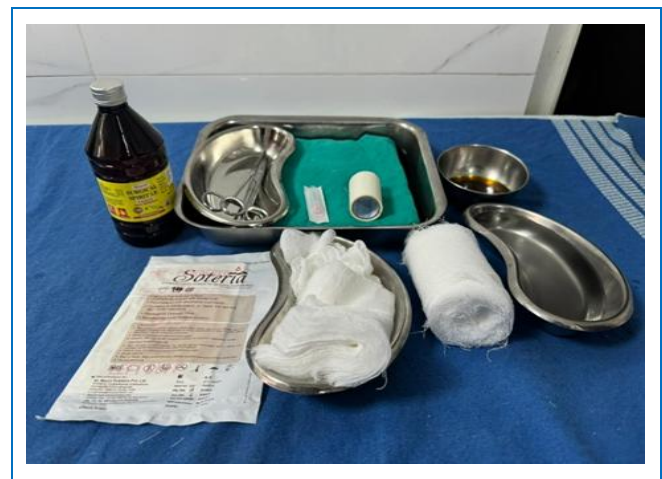
Test Statistics ^a							
	BT	H0	H6	H12	H24	D3	D5
Mann-Whitney U	200.000	200.000	200.000	200.000	200.000	140.000	150.000
Wilcoxon W	410.000	410.000	410.000	410.000	410.000	350.000	360.000
Z	0.000	0.000	0.000	0.000	0.000	-1.964	-2.360

P value (2-tailed)	1.000	1.000	1.000	1.000	1.000	.050	.018
a. Grouping Variable: Groups							
b. Not corrected for ties.							

Overall response

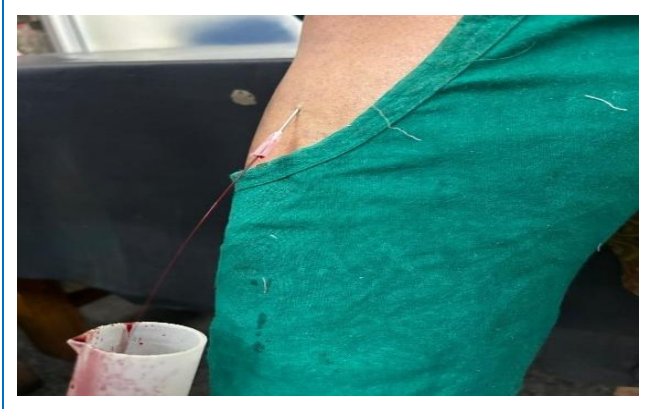
- The parameters of assessment i.e., *Ruka* (Group A: 85% and Group B: 100%), *Toda* (Group A: 100% and Group B: 100%), *Stambha* (Group A: 85% and Group B: 100%), *Spandana* (Group A: 100% and Group B: 100%), SLR test (Group A: 75% and Group B: 100%), Bragard’s test (Group A: 75% and Group B: 100%).
- There is no statistically significant difference between Group A (*Siravyadhana*) and Group B (*Siravyadhana* followed by *Agnikarma*) in most tests at various time points (BT, H0, H6, H12, H24, and D3). However, at D5, significant differences were observed in the SLR and BRAGARD’S tests, with Group B showing better results than Group A. But within the group statistically Significant difference was observed.
- In most of the evaluated parameters (*Ruka*, *Toda*, *Stambha*, *Spandana*, SLR, and Bragard's test), Group B demonstrated clear edge over Group A by providing faster and more effective symptomatic relief based on mean rank.

Material required for *Siravyadhan* and Procedure of *Siravyadhan*





Materials required and procedure of Siravyadhan followed by Agnikarma



DISCUSSION

Discussion on Demographic data

Age: Out of total 40 subjects in group A and Group B, maximum subjects were in age group of 31-40 years. They were 37.5% (15 Subjects), Suggesting its highest prevalence in the 3rd and 4th decade.

Gender: Out of 40 Subjects in group A and group B, maximum Subjects were male. They were 52.5% (21Subjects). And female was 45% (18 Subjects), which indicate that *Gridhrasi* affects both sexes almost equally.

Occupation: Out of 40 Subjects in Group A and Group B, maximum Subjects occupation was Housewife 27.5 % (11 Subjects). The prevalence suggests that poor posture during work, irregular food habits, excessive exercise, less water intake are the predisposing factors for developing *Gridhrasi*.

Socioeconomic status: Out of 40 Subjects in Group A and Group B, maximum Subjects belong from middle class were 72.5% (29 Subjects) who work as labour, drivers, table work, housewives where h/o improper posture, excess work without rest, lifting heavy weight being the cause for *Gridhrasi*.

Diet: In this study, maximum patients having mixed diet 62.5% (25 Subjects), showing that use of *Katu, Tikta, Kashaya Rasa Sevan, Guru Ahara Sevan*, causing *Vata Prakopa*.

Religion: Out of 40 Subjects in Group A and Group B, maximum Subjects were Hindu 90% (36 Subjects). Maximum or almost all patients in this study were observed from Hindu community. But religion does not seem to have any significant relationship with disease *Gridhrasi*. The reason could be the high proportion of Hindu population residing in the study place.

Discussion on Procedure

Siravyadhana

The *Raktamokshana* focuses on *Dushta Raktadosha Nirharana* and is often used to treat blood vitiation-related ailments. In *Raktasamudbhava Vyadhi Rakta* should be treated first. *Siravyadha*, considered in this

study, is one of the chikitsa sutras in *Gridhrasi* and is considered the best remedy for *Shodhana* in the *Raktaja Vikaras*.

Siravyadha is known as *Sarvanga Sodhini*. while the rest of the *Panchakarmas* like *Vamana*, *Virechana* & *Vasti* are specific to each of the *Doshas* and *Sthanas*, but this *Karma* produces *Sodhana* in the entire body. In this study, the therapeutic effect of *Siravyadha* by reducing pain on *Gridhrasi* and whole-body effect shown by *Samyaka Siravyada Lakshanas*.

Poorvakarma: *Raktautkleshana* is crucial before *Siravyadha* (bloodletting therapy). *Tila Yavagu* reduces blood viscosity and improves the process of preparing blood for *Raktanirharana* by serving as *Sadhyosnehana*. *Tila Yavagu* is crucial for *Vicharana* and *Sadya Sneha* in *Siravyadha* because the emphasis is on *Rakta* (blood) rather than *Koshta*

Abhyanga and Swedana: *Abhyanga* was done using *Murchita Tila Taila*, which has *Ushna*, *Teekshna Guna* and by *Abhyanga* vasodilation occurs, and prior to *Swedana*, *Abhyanga* was done. *Swedana* by *Ushna Guna* decreases the viscosity of blood, hence enhances blood flow. After *Sthanika Abhyanga* and *Swedana*, vein becomes prominent thus making easy to perform the procedure.

Pradhanakarma: For *Siravyadha* therapy, the site of vein to be selected is 4 *Angula* above and below the *Janusandhi* or a significant nearby vein is chosen as the location. The vein is then tapped to make it more visible, making the procedure easier. A carefully adjusted tourniquet is tied. Finally, the site is cleaned with surgical spirit and 18 G needle introduced in the vein and blood collected in measuring jar. Haemostasis achieved.

Paschatkarma: After stopping the blood flow, the *Vyadhana* site and foot were cleaned with spirit, and the site was then bandaged. The measurement of the blood was accurately done using a measuring jar. Maximum up to 150ml of blood should be collected (As per *Avara Matra* mentioned by *Aacharya Dalhana*). If excessive amount of blood collected it produces *Rukshata* in the body and may develop complications like *Murcha*, *Pipasa*, *Angamarda*, *Glani*, *Pandu*, *Shosha*.

Agnikarma

Agnikarma is one among the *Anushastrakarma*. There is a direct reference for *Agnikarma* in Ayurvedic classics which can be roughly correlated to cauterization of modern science. However, *Agnikarma* has added benefit of pain management especially in acute or highly painful condition as told by Acharya Susruta as *Athugrarujee*.

The site of *Agnikarma* adopted was- 5 most tender points at *Padakanisthika* (ventral and lateral aspect of 5th toe) of affected leg. *Gridhrasi* is of 2 types, *Vataja* and *Vatakaphaja*, and *Agnikarma* is beneficial as *Vata* and *Kaphahara*. As the symptoms of *Gridhrasi* states *Spikhpoorva Kati Prista Uru Janu Jangha Padam - Kramat*, the disease is seen in entire leg, *Agnikarma* at sciatic nerve endings (*Padakanisthika*) was planned for the study. In *Chikitsa* of *Gridhrasi*, *Agnikarma* has been said. And also there is reference that if any treatment modality fails ultimately *Agnikarma* helps.

Poorvakarma: *Picchilaannapana* was advised prior to *Agnikarma* as this helps to increase *Snighdata* in the body.

Pradhanakarma: Procedure was explained to the patient and consent was taken. The *Bindu Akriti Ruksh Agnikarma* done with the Red Hot *Panchadhātu Shalakra* over the *Padakanisthika* (ventral and lateral aspect of little toe) of affected limb till appearance of *Samyak Dagdha lakshana*.

Paschatakarma: Mixture of *Madhu* and *Grutha* was applied over the *Dagdhavrana* as quoted by *Sushrutacharya*. The procedure accepted generally because of its proximity to the idea of *Agnikarma* in the *Samhitas*.

Discussion on Results

The study assessed the comparative efficacy of *Siravyadhana* alone (Group A) and *Siravyadhana* followed by *Agnikarma* (Group B) in managing *Gridhrasi* symptoms, using parameters like *Ruka*, *Toda*, *Stambha*, *Spandana*, *SLR test*, and *Bragard's test*.

Ruka (Pain): Group B showed faster recovery, with 80% recovery by Day 3 and 100% by Day 5, compared to

60% and 85% in Group A. The p-value of 0.075 on Day 5 indicated a trend toward faster recovery in Group B due to the combined effect of *Agnikarma's Ushna* and *Ruksha* properties along with *Siravyadhana*.

Toda (Pricking Sensation): Group B demonstrated quicker relief, achieving 85% improvement by 12 hours and 95% by 24 hours, compared to 75% and 85% in Group A. Both groups reached 100% recovery by Day 5.

Stambha (Stiffness): Group B showed faster improvement, with 90% recovery by 24 hours and complete recovery by Day 3, while Group A achieved 75% and 90% recovery, respectively. *Agnikarma's Ushna Guna* addressed the *Sheeta* nature of *Vata* and *Kapha*.

Spandana (Twitching): Both groups showed significant improvement, achieving 100% recovery by Day 3. The early recovery was slightly faster in Group B.

SLR Test: Group B demonstrated quicker symptom relief, with 80% reaching Grade 0 by Day 3 and 100% by Day 5, compared to 65% and 75% in Group A. *Agnikarma's Tikshna* and *Sukshma* properties enhanced *Vata* pacification.

Bragard's Test: Both groups showed no improvement by 12 hours. However, Group B reached 80% recovery by Day 3 and 100% by Day 5, compared to 50% and 75% in Group A.

Overall results

While both groups showed significant improvement within their parameters, Group B exhibited faster and more complete recovery across all symptoms. Though most p-values exceeded 0.05, indicating no statistically significant difference, a trend favouring Group B's outcomes was evident, especially by Day 5. The combined action of *Siravyadhana* (removal of *Avarana*) and *Agnikarma* (neutralization of vitiated *Doshas*) proved more effective.

Probable mode of action of *Siravyadhana*

Siravyadha has direct action on *Raktha Dhaatu* and it does the *Dushitaraktanirharana*. There is involvement of *Dusyakandara* in the pathogenesis of *Gridhrasi* as *Kandara* is *Upadhatu* of *Rakta*. So, *Siravyadhana* removes *Dushita Rakta*.

Acharya Sushruta mentioned that in the condition of *Gridhrasi*, there is *Shonitaavarana* and *Siravyadhana* could help in removing this *Avarana*. *Gridhrasi* is having *Ashukari Swabhava*, *Raktamokshana Karma* provides '*Ashu Vedana Shanti*'.

The *Lakshanas* like *Sarva Sandhi-Sharira Shula*, *Sphutana*, *Supti*, *Gatra Spurana* are explained as indications for *Siravyadha* in classics. These *Lakshanas* can be correlated with the symptoms like numbness, weakness, tingling sensation and heaviness of the affected part.

In the *Samprapti* of *Gridhrasi* the *Prakupita Vata*, *Vaata Kaphadosha* cause *Avarana* of *Vaata* and *Rakta*. and *Sthaanasamshraya* of *Dosha* in *Dhamani*, *Sira* and *Naadi* thereby causing *Rasa*, *Rakta* and *Mamsa Dushti* resulting in radiating pain starting from *Sphik* towards *Kati*, *Prishta*, *Uru*, *Jaanu*, *Jangha*. As there is *Rakta* and *Sira* involvement and *Siravyadha* may correct the *Samprapti*.

As *Dalhana* states when there is involvement of *Dosha* and *Dhooshya* in the Disease manifestation *Dhooshya* should be treated and in turn *Dosha* can be brought to normalcy. Hence *Siravyadha* which has direct action on *Raktha Dhatu* may help in *Gridhrasi* in relieving pain.

Gridhrasi is a *Snaayugatavyadhi* and *Snaayu* is an *upadhatu* of *Mamsa Dhaatu* whose quality is in turn dependent on *Shuddha Rakta*. So *Siravyadha* may improve the quality of *Rakta* and there by act on *Mamsa* and *Snaayu*.

The mechanism behind the action of *Siravyadha* can be understand as, the removal of congested blood from the *Avarana* site will reduce the pressure around the nerves may relieves the pain.

After *Siravyadha* there will be improvement in local circulation and reduction of concentration of pain producing substances in blood due to the expulsion of impurified blood. This will help in repairing the damaged tissue and also to block the pain pathway.

Probable mode of action of *Siravyadhana* followed by *Agnikarma*

Acharya Shodhalakrita Gadanigraha and *Chakradatta* mentioned *Siravyadhana* followed by *Agnikarma* in the contest of *Gridhrasi*. *Agnikarma* following

Siravyadhana, effectively relieves pain, especially in cases of *Atiugra ruja*. As *Agni* possess *Usna*, *Tikshna*, *Sukshma*, *Aashukari Guna* which are opposite to *Vata* and *Kapha* so, helped in management of pain.

Acharya Susruta has mentioned that *Agnikarma* is a clear indication for "*Atyagre Ruje*" which may generate from different sites i.e., *Asthi*, *Sandhi*, *Snayu*, *Sira*, *Mamsa* and *Twak* and the disease which cannot be treated with *Yantra*, *Shastra*, *Kshara* can be cured by *Agnikarma* and it is *Apunarbhava chikitsa*. So, it might showed add on effect of it with less chance of reoccurrence.

In *Gridhrasi*, there will be *Vata* and sometimes *Kapha* and in turn there will be increase in *Sheeta Guna*, which causes *Stambha*. When *Agnikarma* is done, it increases *Ushnata* and subside *Sheetaguna* and thus may help in relieving symptoms of *Gridhrasi*.

When direct heat is transferred in to tissue, it causes *Dhatuutkleshana* and improves *Dhatwagni* causing *Amapachana* leading to *Niramata*. Due to *Niramata* of *Vata* and *Kapha*, *Dushya Samurchana Vighatana* takes place. Thus, may bring back normalcy in affected part.

When *Agnikarma* is done, it probably increases the *Sthanikaagni*, by this the waste products (metabolites) which are produced gets excreted, which normalizes the blood circulation thus resulting in reduction in intensity of pain.

In classics there are different materials were used for transferring the therapeutic heat in *Agnikarma* procedures.

Heat produced by the *Agnikarma*, helps to achieve muscle relaxation and relieve muscle spasm with inflammation. Raising the temperature of damaged tissue through Red Hot *Shalaka* may speed up the metabolic process, improve circulation by vasodilatation, reduce oedema, accelerate repair, which can reduce painful stiffness in joints like arthritis. Thus, *Agnikarma* may help in reducing the *Ruka* and *Stambha*.

Counter irritation theory: A counter irritant stimulates sensory nerve endings and thus relieves pain. Effect on muscle tissue: Heat induces muscle relaxation.

TENS Effect: Trans Electric Nerve Stimulation relieves pain by burning superficial nerve endings tends close the gate and prevent the sensory transmission of pain.

Theory of thermodynamics: Theory of thermodynamics on biological system suggests that when thermal energy is transferred from instrument to the tissue, then the thermostatic centre of the body is activated immediately and get activated to distribute this localised rise in temperature throughout the body. So, vasodilatation increases and blood flow increases which result in pain relief.

CONCLUSION

Based on the conceptual study, observation and statistical analysis made in the clinical study, the following conclusions were drawn: There is no statistically significant difference between Group A (*Siravyadhana*) and Group B (*Siravyadhana* followed by *Agnikarma*) in most tests at various time points (BT, H0, H6, H12, H24, and D3). However, at D5, significant differences were observed in the SLR and BRAGARD'S tests, with Group B showing better results than Group A. But within the group statistically Significant difference was observed. In most of the evaluated parameters (*Ruka*, *Toda*, *Stambha*, *Spandana*, SLR, and Bragard's test), Group B demonstrated clear edge over Group A by providing faster and more effective symptomatic relief based on mean rank. Based on observation and result, following Null hypothesis can be accepted. During the follow-up period, 40% of subjects in Group A experienced a recurrence of pain, compared to 30% in Group B. But the intensity of pain was mild. Comparative analysis of overall effect of the treatments in both the groups show that both the groups imparted symptomatic relief from pain in less duration of time, hence adopted as *Atyayika Chikitsa*.

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