

PILOT STUDY

Efficacy of *Gulpha Marma* Therapy and *Agnikarma* in Managing Sciatica (*Gridhrasi*) Pain: A Pilot Study

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ABSTRACT

Background: Low back pain (LBP) represents a leading global health challenge, afflicting 80–90% of individuals at least once in their lifetime, with approximately 5% progressing to true sciatica due to lumbar nerve root irritation. Sciatica manifests as radiating pain from the lumbosacral region to the lower limb, predominantly affecting adults aged 30–50 years and often linked to intervertebral disc herniation or degenerative spondylosis. In Ayurveda, this condition aligns with *Gridhrasi*, a *Vata*-dominant *Nanatmaja Vyadhi* characterized by *Ruka* (pain), *Toda* (pricking sensation), *Stambha* (stiffness), and restricted leg movement.

Aim: This randomized controlled pilot study evaluated the comparative efficacy of two classical Ayurvedic therapies, *Marma Chikitsa* and *Agnikarma* in managing *Gridhrasi* related pain.

Materials and Methods: Thirty patients meeting inclusion criteria were randomly assigned to two parallel groups ($n=15$ each). Group A received daily *Marma Chikitsa* at *Gulpha Marma* for 21 days, while Group B underwent *Agnikarma* at *Antara-Kandara-Gulpha Madhya* weekly over the same period. Primary outcome was pain intensity, measured via Visual Analogue Scale (VAS) on days 1, 7, 14, and 21.

Results: Intragroup analysis revealed significant VAS reductions: Group A from 2.4 to 0.467 ($z = 3.624$, $P < 0.01$); Group B from 2.2 to 1.0 ($z = 3.286$, $P = 0.001$). Intergroup comparisons via Mann-Whitney U-test showed no significant differences at baseline ($P = 0.461$) or endpoint ($p = 0.089$). *Marma Chikitsa* likely modulates pain via neuromodulatory effects like gate control theory, whereas *Agnikarma* induces analgesia through counterirritant thermal effects on aggravated *Vata*.

Discussion and Conclusion: Both interventions yielded clinically meaningful pain relief, supporting their role in *Gridhrasi* management and justifying larger randomized trials.

1. INTRODUCTION

In today's fast-paced world, relentless stress on the musculoskeletal system, including muscles, joints, and spine, triggers structural strain, injuries, and misalignments, often culminating in low back pain

(LBP). LBP ranks as a major global health issue, striking people of all ages and jobs. It typically starts as acute pain but can turn chronic or recurrent.^[1] Studies show LBP as the second leading cause of doctor visits, with 80–90% of individuals facing it at least once in life. Of these, roughly 5% involve true sciatica from nerve root irritation.^[2]

Sciatica manifests as radiating pain tracing the sciatic nerve from the lower back through the buttocks to the back of the thigh and leg, often with numbness, tingling, or weakness. It typically stems

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from lumbar nerve root compression or irritation by disc herniation or osteophytes.^[3] Globally, prevalence spans 2–5%, while in India, lifetime rates hit 10–40% and annual ones 1–5%. It mainly strikes adults aged 30–50, without strong gender differences. Key risks: Heavy labor, obesity, sedentary living, and smoking. Although many improve with conservative care, 10–40% face chronic issues requiring advanced intervention.^[4]

Ayurveda equates sciatica with *Gridhrasi Roga*, named for the vulture-like gait (*Gridhra Gati*) it produces. *Acharya Charaka* lists it among the 80 *Vataja Nanatmaja Vyadhi*, marked by *ruka*, *toda*, *muhuspandana*, and *stambha*.^[5] *Sushruta* includes *sakthikshepana nigrhanti*,^[6] whereas *Vata-Kaphaja Gridhrasi* adds *tandra*, *gaurava*, and *aruchi*. Aggravated *Vata Dosha* disrupts neuromuscular balance, causing the disorder. Treatment emphasizes *nidana parivarjana* and *Panchakarma* like *abhyanga*, *swedana*, *basti*, and *raktamokshana* to soothe *Vata*, delivering lasting relief with minimal side effects compared to modern options.

Marma Chikitsa forms a vital Ayurvedic therapy, targeting *Marma Sthanas*, special body vital points. Classical texts identify 107 such points, where trauma to major ones can prove fatal. *Acharya Sushruta* defines a *Marma* as the confluence of five elements: *mamsa* (muscle), *sira* (vessels), *snayu* (ligaments), *asthi* (bone), and *sandhi* (joints).^[7] Gentle stimulation balances *Prana Vayu* and harmonizes the *doshas*. Beyond anatomy, these *Marma Sthanas* serve as dynamic energy hubs where *Vata*, *Pitta*, and *Kapha* manifest subtly as *Prana*, *Tejas*, and *Ojas*, influenced by *gunas Sattva*, *Rajas*, and *Tamas* and linked to *Bhutatma*, the individual's core life force.^[8]

This article focuses on *Gulpha Marma*, located at the junction of the foot (*pada*) and leg (*jangha*). Measuring 2 *angula* in size, it qualifies as a *Sandhi Marma*, a structural junction. Classified as *Rujakara Marma*, injury here causes intense pain. Specific trauma to the *Gulpha Marma* triggers severe pain, foot paralysis, and inability to walk.^[9]

Agnikarma is a para-surgical procedure employing controlled thermal application for managing pain, inflammation, and musculoskeletal disorders. Rooted in the *Sushruta Samhita*, it has been practiced for over 2500 years to treat conditions such as arthritis, spondylosis, and sciatica. Considered superior to *Kshara* and *Shastra Karma* for its rapid and minimally invasive results, *Agnikarma* remains a valuable treatment for chronic pain management.^[10]

This study evaluates the efficacy of these two classical Ayurvedic therapies *Marma Chikitsa* and *Agnikarma* in alleviating pain and enhancing the quality of life for *Gridhrasi* patients.

2. MATERIALS AND METHODS

Patients diagnosed with *Gridhrasi* (Sciatica) were selected from the Outpatient Departments (OPD) of *Shalyatantra*, *Kayachikitsa*, *Panchakarma*, and *Marma chikitsa OPD* at Pt. Khushilal Sharma Government Ayurveda Hospital, Bhopal (M.P.). Selection was carried out after applying predefined inclusion and exclusion criteria. In this study, 30 patients were registered irrespective of their age, sex, religion, etc. They were randomly divided into two groups by the random sequence method.

2.1. Inclusion Criteria

- Patients of either sex in the age group of 20–60 years
- Clinical signs and symptoms of *Gridhrasi* are given in the classical text

- Tenderness at the course of the sciatic nerve
- Severe pain on squatting
- Patient who was willing to be registered for study.

2.2. Exclusion Criteria

- Fracture related to spine
- Traumatic, infective, and neoplastic conditions of spine
- Patient having hemoglobin % <07.00 mg/dL
- Cardiac disease (ischemic heart disease, coronary artery disease, myocardial infarction, etc.)
- Pregnant women and lactating women
- Patient who had any haematological and bleeding disorder.

The study was approved by the Institutional Ethical Committee, and signed informed consent was obtained from all the patients.

2.3. Study Design

The study was conducted as a randomized controlled clinical trial, enrolling 30 patients who met the inclusion criteria, and allocating them by simple random sampling into two equal groups of 15 patients each as given in Table 1.

2.4. Assessment Criteria

Assessment was conducted at weekly intervals on Day 1, 7, 14, and 21 to evaluate the efficacy of *Marma Chikitsa* and *Agnikarma* in *Gridhrasi*. Pain intensity was assessed using the Visual Analog Scale and graded as given in Table 2.

3. OBSERVATIONS AND RESULT

The demographic profile is shown in Table 3.

In the individual group analysis, both therapies demonstrated statistically significant reduction in *Ruka* (pain) among patients with *Gridhrasi*. In Group A (*Marma Chikitsa*), the mean pain grade decreased from 2.4 before treatment to 0.467 after treatment, with a mean difference of 0.56. The Wilcoxon signed rank test yielded a z-value of 3.624 and a $P < 0.01$, indicating a highly significant improvement. Similarly, in Group B (*Agnikarma*), the mean pain grade reduced from 2.2 before treatment to 1.0 after treatment, showing a mean difference of 0.533. The Wilcoxon signed rank test revealed a z-value of 3.286 with a $P = 0.001$, confirming statistically significant pain relief. These findings suggest that both interventions were effective in reducing pain severity within their respective groups as shown in Table 4.

In the comparative analysis between the two groups using the Mann–Whitney U-test, the baseline (before treatment) mean pain scores were 2.4 in Group A and 2.2 in Group B, with a $P = 0.461$, indicating no statistically significant difference at baseline. After treatment, the mean pain scores reduced to 0.467 in Group A and 1.0 in Group B; however, the $P = 0.089$, which was not statistically significant. Although Group A demonstrated a comparatively greater reduction in mean pain score, the intergroup difference did not reach statistical significance. Therefore, while both *Marma Chikitsa* and *Agnikarma* were individually effective in alleviating pain in *Gridhrasi*, neither therapy proved superior to the other statistically as shown in Table 5.

4. DISCUSSION

The prevalence of *Gridhrasi* (sciatica) is set to rise, driven by sedentary lifestyles, prolonged computer use, obesity, mental stress, hectic work

demands, and modern commuting patterns. These factors promote poor posture, a key trigger for spinal and nerve compression in today's world. Despite advances in medicine, sciatica remains without a permanent cure, relying on analgesics or surgery that offer only short-term relief. Prolonged nonsteroidal anti-inflammatory drugs and steroid use risks serious side effects, including kidney and liver damage, plus gastritis. Addressing these limitations, this study investigates an Ayurvedic intervention for sustained relief with negligible adverse effects.

In this study, the largest patient group (40%) fell in the 31–40-year age range, underscoring *Gridhrasi*'s higher incidence among middle-aged adults. This matches contemporary medical insights, as intervertebral disc degeneration often starts in the third and fourth decades, with discs losing hydration and elasticity, leading to herniation and nerve root compression. Aggravating factors include prolonged sitting, heavy lifting, and occupational stress on the lumbosacral region. Males showed a slight edge (53.3%), likely from physically intensive tasks such as load-bearing, extended standing, and long-haul driving, which heighten spinal mechanical load. Homemaker formed the biggest occupational cohort (36.67%), attributable to repetitive chores such as carrying water buckets and constant forward bending that burden the lower back. Notably, 50% of patients reported moderate physical activity and 30% heavy labor, implying diverse exertion levels may trigger or worsen *Gridhrasi*. Left-sided involvement (53.33%) was slightly more common than right-sided (46.67%), although no anatomical predisposition can be inferred due to the symmetrical structure of the spine.

Lifestyle and clinical features underscored *Gridhrasi*'s chronic, multifactorial profile. Most patients (56.67%) drank tea over 3 times daily, with 20% chewing tobacco. In Ayurveda, excess *Kashaya Rasa*-dominant substances can provoke *Vata Dosha* through their drying, destabilizing effects, exacerbating musculoskeletal issues like *Gridhrasi*. Sleep issues (*Anidra*) affected 33.33%, probably from intense pain disrupting rest, whereas 53.33% enjoyed balanced sleep (*Samyaka Nidra*), aided by supine positioning that eases spinal load. Continuous pain marked 76.67% of cases, signaling ongoing nerve root compression and the disorder's chronicity. In addition, 23.33% displayed an abnormal limp with slight flexion of the affected limb, the classic *Gridhrasi* sign in Ayurveda termed *Gridhra Gati* for its vulture-like gait. This develops in advanced cases from chronic sciatic irritation, pain, and impaired mobility.

In this study, both therapies markedly reduced pain in *Gridhrasi* (sciatica) patients, although without a statistically significant difference between groups. *Marma Chikitsa* likely induces analgesia through *Marma* stimulation and gate control-like pain signal modulation, whereas *Agnikarma* eases symptoms through its *Ushna Guna* antagonizing *Vata*'s *Sheeta Guna* by improving local circulation and lowering inflammatory mediators, as per *Samanya Vishesh Siddhant*.

Targeting sciatica through *Gulpha Marma* stimulation with *Marma Chikitsa*, or *Agnikarma* at nearby *Gulpha Marma* or *Antarakanadar-gulpha-madhya*, may activate the posterior tibial nerve for neuromodulation. This suggests a key mechanism for *Gulpha Marma* therapy, warranting further research to substantiate its effects and mechanisms.

Marma Chikitsa alleviates pain by using the Gate Control Theory, where a "gate" in the spinal cord's dorsal horn modulates pain signals to the brain. This involves slow, unmyelinated C-fibers conveying dull, aching pain via substance P (opening the gate) and fast, myelinated A-beta fibers transmitting touch, pressure, and vibration

through glutamate (closing the gate and suppressing pain). Targeted *Marma* stimulation activates these A-beta fibers, engaging inhibitory interneurons to block C-fiber signals from reaching the brain. Thus, *Marma Chikitsa* "closes the gate" on pain transmission, mirroring TENS or acupressure for swift, drug-free relief in *Gridhrasi*, much like contemporary nonpharmacological methods.^[11]

Agnikarma alleviates sciatica primarily by pacifying aggravated *Vata* through controlled therapeutic heat, while inducing local neurovascular and tissue changes that reduce pain, stiffness, and nerve irritation. In Ayurvedic terms, *Gridhrasi*, a *Vata-pradhana Vata-Kapha* disorder, is ideally managed by *Agnikarma* due to *Agni*'s *Ushna*, *Tikshna*, *Sukshma*, and *Ashukari gunas*, which oppose *Vata* and *Kapha* qualities; these properties clear *Srotorodha*, normalize *Vata gati*, and relieve *ruka*.^[12] Neurophysiologically, heat activates cutaneous nociceptors, engaging gate-control and descending inhibitory pathways for rapid analgesia; repetitive stimulation may further promote partial thermal denervation, fiber desensitization, modulated nerve conduction, and reduced ectopic discharges from irritated roots, thereby diminishing radiating pain, enhancing straight-leg raise test results, and improving mobility.

5. CONCLUSION

The present pilot study demonstrates that both *Marma Chikitsa* and *Agnikarma* are effective in reducing *Ruka* (pain) in patients with *Gridhrasi*. In Group A, the mean pain score decreased from 2.4 to 0.467, reflecting an approximate 80.5% reduction, which was statistically highly significant ($P < 0.01$). In Group B, the mean score reduced from 2.2 to 1.0, showing an approximate 54.5% reduction ($P = 0.001$). Although *Marma Chikitsa* showed a comparatively greater percentage improvement, the intergroup difference was not statistically significant ($P = 0.089$). Both therapies thus provide substantial clinical relief and may serve as safe, effective alternatives in the management of *Gridhrasi*.

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7. AUTHORS' CONTRIBUTIONS

All authors give equal contribution in making of this manuscript.

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9. ETHICAL STATEMENT

The study is approved by institutional ethical committee number KLSGACI/IEC/2023/RS-51.

10. CONFLICT OF INTERESTS

The authors declare no conflicts of interest regarding the publication of this paper.

11. DATA AVAILABILITY STATEMENT

The data analyzed in this review were obtained from publicly available sources, including peer-reviewed articles, observational studies, and surveys accessible through databases.

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Table 1: Grouping and posology

Parameter	Group A– <i>Marma Chikitsa</i> (study group)	Group B– <i>Agnikarma Chikitsa</i> (control group)
Number of patients	15	15
Site of intervention	<i>Gulpha Marma</i>	<i>Antara-Kandara-Gulpha Madhya</i>
Procedure	<i>Marma Chikitsa</i>	<i>Agnikarma Chikitsa</i> using <i>Panchdhatu Shalaka</i>
Number of applications	15–18 sittings	4–6 Bindu of <i>Samyak Dagdha Vrana</i> per sitting
Interval of administration	Once daily	At 7-day intervals (Day 1, 7, 14, 21)
Duration of treatment	21 days	21 days
Spacing between applications	Not applicable	½ Angul (approximately 1 cm) between two <i>Samyak Dagdhas</i>
Pre-procedure care	Not specified	<i>Prakshalana</i> with <i>Triphala Kwatha</i>
Post-procedure care	Not specified	Application of <i>Madhughrita</i> over <i>Samyak Dagdha Vrana</i>
Follow-up	On 7 th day	On 7 th day
Figures referenced	Figure 1	Figures 2 and 3

Table 2: Assessment criteria

VAS score	Grade
0	No pain
1–3	Mild pain
4–6	Moderate pain
7–10	Severe pain

VAS: Visual analog scale

Table 3: Demographic profile

Variable	Category	Number (%)
Age group (years)	31–40	12 (40)
	51–60	8 (26.67)
Gender	Male	16 (53.3)
	Female	14 (46.7)
Residence	Urban	19 (63.33)
	Rural	11 (36.67)
Socio-economic status	Middle Income	23 (76.67)
	Higher Income	4 (13.33)
	Lower Income	3 (10)
Marital status	Married	22 (73.33)
	Unmarried	8 (26.67)
Education	Postgraduate/Higher Secondary	9 (30)
	Graduate	8 (26.67)
Occupation	Homemaker	11 (36.67)
	Govt/private employment	9 (30)
Nature of work	Moderate	15 (50)
	Heavy	9 (30)
<i>Nidra</i>	<i>Samyak</i>	16 (53.33)
	<i>Anidra</i>	10 (33.33)
Addiction	Tea or coffee	17 (56.67)
	Tobacco	6 (20)
<i>Kostha</i>	<i>Madhyam</i>	13 (43.33)
	<i>Krura</i>	9 (30)
Side affected	Left leg	16 (53.33)
	Right leg	14 (46.67)
Chronicity	<1 year	15 (50)
	1–2 year	10 (33.33)
Course of pain	Continuous	23 (76.67)
	Intermittent	7 (23.33)
Disturbance in gait	Present	7 (23.33)
	Absent	23 (76.67)

Table 4: Effect of therapy on *Ruka* (pain) grade in Groups A and B

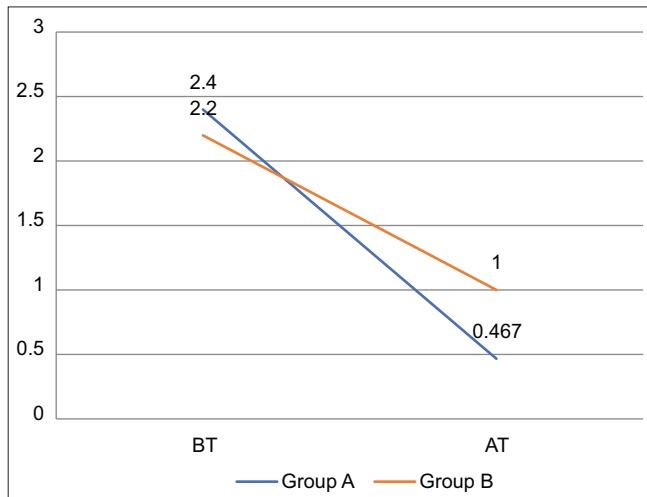
Group	Mean score	MD	SD	SEM	z-value	P-value	Significant <0.05
Group A							
BT	2.4	0.56	0.632	0.158	3.624	<0.01	S
AT	0.467	0.56	0.64	0.159			
Group B							
BT	2.2	0.533	0.676	0.168	3.286	0.001	S
AT	1	0.533	0.845	0.210			

SD: Standard deviation, SEM: Standard error of mean, MD: Mean deviation, S: Significant

Table 5: Comparison of mean *Ruka* (pain) grade of Group A and Group B by Mann-Whitney U-test

Group	Mean	SD	SEM	Z-value	U-value	P-value	Significant <0.05
BT							
GRP A	2.4	0.632	0.158	-0.829	94.5	0.461	NS
GRP B	2.2	0.676	0.168				
AT							
GRP A	0.467	0.64	0.16	-1.881	71	0.089	NS
GRP B	1	0.845	0.211				

SD: Standard deviation, SEM: Standard error of mean, MD: Mean deviation, NS: Non-Significant

**Graph 1:** Comparison of mean *Ruka* (Pain) grade of group A and group B**Figure 1:** *Gulpha Marma* stimulation through *marma chikitsa***Figure 2:** *Agnikarma* at *Antara- kandara Gulpha Madhya***Figure 3:** *Madhughrita* applied on *Samyak dagdha vrana*