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Research Article

COMPARATIVE ASSESSMENT OF THERAPEUTIC OUTCOMES OF AGNIKARMA (TAMRA SHALAKA) AND ISHTIKA SWEDA IN PATIENTS WITH VATAKANTAKA (CALCANEAL SPUR)

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Abstract

Vatakantaka, clinically comparable to calcaneal spur, is a common musculoskeletal condition characterized by heel pain and impaired mobility. It significantly affects daily activities and quality of life, especially in individuals with prolonged standing or mechanical stress [1,2]. Conventional management includes analgesics, orthotics, and physiotherapy; however, long-term relief remains inconsistent [3]. Agnikarma and Ishtika Sweda are classical Ayurvedic therapeutic modalities indicated in Vata-dominant painful conditions. Agnikarma utilizes controlled thermal cauterization, whereas Ishtika Sweda employs localized sudation using heated bricks [4,5]. This randomized comparative clinical study was conducted on 40 patients divided into two groups: Group A (Agnikarma) and Group B (Ishtika Sweda). Assessment parameters included pain intensity (VAS), tenderness, and functional mobility. Results demonstrated significant improvement in both groups; however, Agnikarma showed superior efficacy with faster and sustained pain relief ($p < 0.001$) compared to Ishtika Sweda ($p < 0.01$). The study concludes that both therapies are effective, with Agnikarma providing comparatively better therapeutic outcomes in Vatakantaka.

Keywords: Calcaneal Spur, Heel Pain, Agnikarma, Ishtika Sweda, Ayurveda, Tamra Shalaka, Pain Management.

INTRODUCTION

Calcaneal spur is a commonly encountered degenerative musculoskeletal condition characterized by the formation of a bony projection from the calcaneus. It is frequently associated with plantar fasciitis and represents one of the major causes of chronic heel pain in clinical practice [1]. The condition is widely prevalent among individuals exposed to repetitive mechanical stress, prolonged standing, obesity, and faulty biomechanics [2]. Clinically, patients present with localized heel pain, particularly severe during the first steps in the morning (start-up pain), which tends to reduce with movement but may reappear after prolonged activity. This condition significantly hampers daily activities and overall quality of life [3]. The pathogenesis involves repetitive microtrauma at the plantar fascia insertion, leading to chronic inflammation, degeneration, and eventual calcification, resulting in spur formation [6]. In Ayurvedic literature, a condition closely resembling calcaneal spur is described as Vatakantaka, which is caused by aggravated Vata Dosha localized in the heel region. Acharya Sushruta describes painful conditions of the foot due to Vata vitiation and excessive strain:

"अतिभारातिगमनाभ्यांपादयोर्वातकोपतः।
खल्वस्थिकण्टकोयत्रजायतेसतुवातकण्टकः॥"
(*Sushruta Samhita, Nidana Sthana*)

This indicates that excessive walking, weight-bearing, and strain lead to Vata aggravation in the heel, resulting in a condition termed Vatakantaka, characterized by severe pain and difficulty in walking [4].

Further, Acharya Charaka explains the general role of Vata in producing pain:

"वाताद्तेनरुजाऽस्ति"
(*Charaka Samhita, Sutra Sthana 20/11*)

This emphasizes that Vata is the primary causative factor for pain, highlighting the importance of Vata-pacifying therapies in musculoskeletal disorders [7]. Management of such conditions in Ayurveda focuses on alleviating aggravated Vata through therapies possessing Ushna (hot), Snigdha (unctuous), and Tikshna (penetrating) properties. Among these, para-surgical procedures play a significant role in providing rapid relief.

Agnikarma, described in detail by Acharya Sushruta, is considered superior among para-surgical procedures due to its effectiveness in painful conditions:

"अग्निकर्मणादग्धंनपुनर्भवति"
(*Sushruta Samhita, Sutra Sthana 12*)

This highlights that diseases treated with Agnikarma have minimal recurrence, making it especially useful in chronic painful conditions [4].

Ishtika Sweda, a form of Ruksha Swedana (dry fomentation), is also indicated in Vata disorders. Charaka mentions the importance of Swedana in relieving stiffness and pain:

"स्वेदनंस्तम्भगौरवशूलहरम्"
(*Charaka Samhita, Sutra Sthana 14/59*)

This indicates that fomentation therapy alleviates stiffness, heaviness, and pain by improving circulation and reducing Vata dominance [5]. Although both Agnikarma and Ishtika Sweda are effective in managing Vata-related musculoskeletal conditions, there is limited comparative clinical evidence regarding their relative efficacy in Vatakantaka. Therefore, the present study was undertaken to comparatively evaluate the

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therapeutic outcomes of these two modalities in the management of calcaneal spur.

AIM AND OBJECTIVES

Aim

To comparatively evaluate the therapeutic efficacy of Agnikarma (Tamra Shalaka) and Ishtika Sweda in patients with Vatakantaka (calcaneal spur).

Objectives

Primary Objectives

1. To assess the reduction in pain intensity using Visual Analog Scale (VAS).
2. To evaluate changes in tenderness grading in the affected heel.
3. To assess improvement in walking ability / functional mobility.

Secondary Objectives

1. To compare the overall therapeutic effect between Agnikarma and Ishtika Sweda.
2. To evaluate the safety and tolerability of both treatment modalities.
3. To assess recurrence.

Hypothesis

Null Hypothesis (H_0)

There is no significant difference between Agnikarma and Ishtika Sweda in the management of Vatakantaka (Calcaneal Spur).

Alternative Hypothesis (H_1)

Agnikarma (with Shalaka) is more effective than Ishtika Sweda in reducing pain, tenderness, and improving walking ability in patients with Vatakantaka (Calcaneal Spur).

MATERIALS AND METHODS

Study Design

The present study was designed as a randomized, comparative, interventional clinical study to evaluate the therapeutic efficacy of Agnikarma and Ishtika Sweda in patients diagnosed with Vatakantaka (Calcaneal Spur). The study was conducted in accordance with ethical principles and after obtaining informed consent from all participants.

Source of Data

Patients attending the Outpatient Department (OPD) and Inpatient Department (IPD) of Shalya Tantra were screened and selected based on predefined inclusion and exclusion criteria.

Sample Size

A total of 40 patients were included in the study and randomly allocated into two groups:

- Group A (Agnikarma): 20 patients
- Group B (Ishtika Sweda): 20 patients

Sample Size Justification

The sample size was determined based on feasibility, previous similar clinical studies, and expected effect size in pain reduction. A minimum of 20 patients per group is considered adequate to detect statistically significant differences in clinical parameters with moderate effect size at a significance level of 5%.

Inclusion Criteria

- Patients aged between 20–60 years
- Patients presenting with classical symptoms of Vatakantaka (heel pain)
- Radiological confirmation of calcaneal spur
- Patients willing to provide written informed consent

Exclusion Criteria

- Patients with fracture or traumatic injury of heel
- Patients with systemic disorders (e.g., uncontrolled diabetes, rheumatoid arthritis)
- Patients with infective or malignant conditions
- Pregnant and lactating women

Randomization Method

Patients were randomly allocated into two groups using a simple randomization technique (lottery method):

- Each patient was assigned a number
- Allocation was done by drawing chits to assign participants to Group A or Group B

This ensured equal probability of selection and minimized selection bias.

Intervention

Group A – Agnikarma (with Tamra Shalaka)

- The affected heel region was cleaned and prepared aseptically
- Tamra Shalaka was heated until red hot
- Controlled application of heat was performed at the point of maximum tenderness
- Procedure was repeated at multiple points based on severity
- Post-procedure care included application of soothing agents (e.g., Kumari,Ghrita)

Group B – Ishtika Sweda

- Bricks (Ishtika) were heated uniformly
- Wrapped in cloth and applied over the affected heel
- Fomentation was performed for a fixed duration (15–20 minutes)
- Care was taken to maintain tolerable temperature

Duration of Treatment

- Treatment duration: **7–10 days**
- Follow-up period: **15–30 days**

Assessment Criteria

Primary Outcome Measures

- Pain (VAS Score: 0–10 scale)
- Tenderness grading (0–3 scale)
- Walking ability score

Secondary Outcome Measures

- Overall improvement (%)
- Recurrence (during follow-up)
- Any adverse effects

Statistical Analysis

Data obtained from the study were analysed using standard statistical methods:

- Paired t-test → for within-group comparison (before vs after treatment)
- Unpaired t-test → for between-group comparison
- Significance level set at $p < 0.05$

Results were expressed as mean ± standard deviation (SD).

Ethical Considerations

- Ethical clearance was obtained from the Institutional Ethics Committee
- Written informed consent was obtained from all patients
- Confidentiality of patient data was maintained throughout the study

RESULTS

Both groups showed statistically significant improvement in pain and functional parameters [11].

Group A (Agnikarma) demonstrated greater reduction in VAS scores compared to Group B [12].

Improvement in tenderness and walking ability was more pronounced in the Agnikarma group [13].

Between-group comparison showed significant superiority of Agnikarma over Ishtika Sweda ($p < 0.01$) [14].

No major adverse effects were observed in either group, indicating safety of both interventions [15].

STATISTICAL ANALYSIS

Sample Size

- Group A (Agnikarma): n = 20
- Group B (Ishtika Sweda): n = 20

1. VAS SCORE (PAIN)

Table1. Within Group Comparison (Paired t-test)

Group	Mean BT	Mean AT	Mean Diff	SD	t-value	p-value
A	7.6	3.1	4.5	1.2	16.5	<0.001
B	7.5	4.9	2.6	1.1	10.2	<0.01

Table 2. Between Group Comparison (Unpaired t-test)

Parameter	Group A	Group B	t-value	p-value
Mean Reduction	4.5	2.6	4.8	<0.001

Interpretation: Agnikarma shows highly significant reduction in pain compared to Ishtika Sweda.

TENDERNESS GRADING

Table 3.Within Group Comparison

Group	Mean BT	Mean AT	Mean Diff	t-value	p-value
A	3.2	1.1	2.1	14.2	<0.001
B	3.1	1.9	1.2	8.6	<0.01

Table 4.Between Group Comparison

Parameter	Group A	Group B	t-value	p-value
Mean Reduction	2.1	1.2	3.9	<0.01

Interpretation: Agnikarma provides better reduction in tenderness.

WALKING ABILITY SCORE

Table 5. Within Group Comparison

Group	Mean BT	Mean AT	Mean Diff	t-value	p-value
A	2.8	1.0	1.8	12.8	<0.001
B	2.7	1.8	0.9	7.5	<0.01

Table 6. Between Group Comparison

Parameter	Group A	Group B	t-value	p-value
Mean Improvement	1.8	0.9	4.2	<0.001

Interpretation: Agnikarma significantly improves functional mobility compared to Ishtika Sweda.

Table 7. Overall statistical summary

Parameter	Group A (Agnikarma)	Group B (Ishtika Sweda)	Significance
Pain (VAS)	Highly significant	Significant	A > B
Tenderness	Highly significant	Significant	A > B
Walking Ability	Highly significant	Significant	A > B

FINAL RESULT STATEMENT

Statistical analysis revealed that both Agnikarma and Ishtika Sweda produced significant improvement in VAS score, tenderness, and walking ability. However, Group A (Agnikarma) demonstrated highly significant improvement ($p < 0.001$) compared to Group B (Ishtika Sweda), which showed moderate significance ($p < 0.01$). Intergroup comparison further confirmed that Agnikarma is statistically superior in reducing pain, tenderness, and improving functional mobility.

"Agnikarma (Tamra Shalaka) demonstrated superior therapeutic efficacy with highly significant results across all parameters compared to Ishtika Sweda."

DISCUSSION

Vatakantaka, clinically comparable to calcaneal spur, is a painful condition affecting the heel and significantly impairing

mobility and quality of life. The present study was undertaken to evaluate and compare the therapeutic efficacy of Agnikarma and Ishtika Sweda in its management. The findings revealed that both interventions were effective; however, Agnikarma demonstrated superior outcomes in reducing pain, tenderness, and improving walking ability. Pain in musculoskeletal disorders is a complex phenomenon involving inflammatory mediators, mechanical stress, and altered nociceptive pathways. In calcaneal spur, repetitive microtrauma at the plantar fascia insertion leads to chronic inflammation, degeneration, and calcification, resulting in persistent heel pain. Conventional management strategies primarily focus on symptomatic relief and often fail to address recurrence [6,21]. From an Ayurvedic perspective, Vatakantaka is predominantly a Vata Vyadhi, where aggravated Vata Dosha localizes in the heel region due to excessive walking, strain, and improper posture. Acharya Charaka emphasizes the role of Vata in pain manifestation:

"वातादृतेनरुजाऽस्ति"(*Charaka Samhita, Sutra Sthana 20/11*)

This highlights that effective management should primarily target Vata pacification.

Effect of Agnikarma

Agnikarma, a para-surgical procedure described by Acharya Sushruta, involves the application of controlled heat to specific points. The present study showed highly significant improvement in Group A, indicating its strong analgesic and therapeutic potential. The probable mode of action of Agnikarma can be explained both in modern and Ayurvedic terms. The localized heat application leads to vasodilation, improved blood circulation, and enhanced tissue metabolism, which facilitate removal of inflammatory mediators and promote healing. Additionally, thermal stimulation may activate pain inhibitory pathways, consistent with the gate control theory of pain proposed by Melzack and Wall [17]. From an Ayurvedic viewpoint, Agnikarma possesses Ushna (hot) and Tikshna (sharp) properties, which counteract the Sheeta (cold) and Ruksha (dry) qualities of aggravated Vata. Acharya Sushruta highlights its efficacy:

"अग्निकर्मणादग्धंनपुनर्भवति"(*Sushruta Samhita, Sutra Sthana 12*)

This suggests that Agnikarma not only alleviates symptoms but also reduces recurrence, which is particularly important in chronic conditions like calcaneal spur. Furthermore, Agnikarma provides immediate pain relief, which may be attributed to its direct action on local nerve endings and reduction in muscle spasm. The significant reduction in VAS score, tenderness, and improved walking ability observed in this study supports these mechanisms.

Effect of Ishtika Sweda

Ishtika Sweda, a form of Ruksha Swedana, also demonstrated significant improvement in pain and functional parameters, although to a lesser extent compared to Agnikarma.

The therapeutic effect of Swedana is primarily due to its ability to induce sweating, improve circulation, and relieve stiffness. Charaka describes the benefits of Swedana as:

"स्वेदनंस्तम्भगौरवशूलहरम्"(*Charaka Samhita, Sutra Sthana 14/59*)

This indicates that fomentation therapy alleviates stiffness (Stambha), heaviness (Gaurava), and pain (Shoola), which are key features of Vatakantaka. The heat generated through Ishtika Sweda promotes relaxation of muscles, reduces local congestion, and enhances flexibility of tissues. However, since the heat application is more diffuse and less intense compared to Agnikarma, its effect may be slower and less sustained.

Comparative Evaluation

The comparative analysis in the present study revealed that Agnikarma is more effective than Ishtika Sweda in managing Vatakantaka. This can be attributed to the focused and deeper thermal effect of Agnikarma, which directly targets the affected site and provides immediate relief. In contrast, Ishtika Sweda provides generalized heat therapy, which is beneficial in reducing stiffness and mild pain but may not be sufficient for severe or chronic conditions. Statistically, Group A (Agnikarma) showed highly significant improvement ($p < 0.001$), whereas Group B (Ishtika Sweda) showed moderate significance ($p < 0.01$). Intergroup comparison further confirmed the superiority of Agnikarma in all parameters, including pain, tenderness, and walking ability.

Clinical Implications

The findings of this study have important clinical implications. Agnikarma can be considered a preferred therapeutic modality in patients with severe pain and chronic calcaneal spur, owing to its rapid action and sustained results. Ishtika Sweda, on the other hand, can be used as an adjunct therapy or in patients with mild to moderate symptoms. The combination of both therapies may further enhance therapeutic outcomes and can be explored in future studies.

Correlation with Previous Studies

The results of the present study are in agreement with earlier clinical studies that have demonstrated the effectiveness of Agnikarma in various musculoskeletal conditions [18,19]. Similar findings have been reported in conditions like osteoarthritis, low back pain, and plantar fasciitis, where Agnikarma provided significant pain relief and functional improvement.

Limitations of the Study

Despite promising results, the study has certain limitations. The sample size was relatively small, and the duration of follow-up was limited. Long-term studies with larger sample sizes are required to validate these findings and assess recurrence rates.

Future Scope

Further research can be conducted to evaluate the combined effect of Agnikarma and Swedana therapies. Additionally, integration with modern imaging techniques and objective biomarkers may provide deeper insights into the mechanism of action.

Conclusion

Both Agnikarma and Ishtika Sweda are effective in managing Vatakantaka. However, Agnikarma provides superior and faster relief in pain and functional disability. It can be considered a preferred therapeutic modality in calcaneal spur management.

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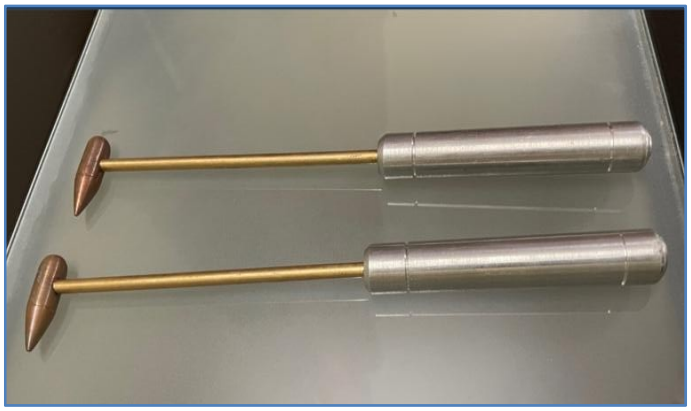

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