

A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFICACY OF AGNIKARMA WITH SWARNA SHALAKA AND PANCHDHATU SHALAKA IN THE MANAGEMENT OF VATKANTAKA (PLANTAR FASCIITIS)

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ABSTRACT

Background: Vatakantaka, described in Ayurvedic classics under Vata Vyadhi, closely resembles plantar fasciitis in contemporary medicine. It is characterized by severe pain and tenderness in the heel region, resulting in difficulty during walking and daily activities. Agnikarma has been advocated as an effective treatment modality for Vatakantaka. The present study was undertaken to compare the efficacy of Agnikarma performed with Swarna Shalaka and Panchdhatu Shalaka in the management of Vatakantaka.

Aim and Objectives: To evaluate and compare the therapeutic efficacy of Agnikarma using Swarna Shalaka and Panchdhatu Shalaka in patients suffering from Vatakantaka.

Materials and Methods: A comparative clinical study was conducted on 40 patients diagnosed with Vatakantaka. The patients were non-randomly divided into two groups comprising 20 patients each. Group A was treated with Agnikarma using Swarna Shalaka, while Group B received Agnikarma using Panchdhatu Shalaka. Agnikarma was performed at weekly intervals following standard Ayurvedic procedures. The assessment criteria included pain, tenderness, and morning stiffness, which were evaluated before treatment and during follow-up visits. Statistical analysis was performed using the Wilcoxon signed-rank test and Mann-Whitney U test.

Results: Both groups showed statistically highly significant improvement in the symptoms of Vatakantaka. Group A (Swarna Shalaka) demonstrated comparatively better results, with complete relief observed in 85% of patients, whereas Group B (Panchdhatu Shalaka) showed complete relief in 50% of patients. The reduction in pain and improvement in functional ability was more pronounced in the Swarna Shalaka group.

Conclusion: Agnikarma is an effective and safe treatment modality for the management of Vatakantaka. Although both Swarna Shalaka and Panchdhatu Shalaka provided significant relief, Agnikarma with Swarna Shalaka exhibited superior therapeutic efficacy compared to Panchdhatu Shalaka.

KEYWORDS: Vatakantaka, Plantar Fasciitis, Agnikarma, Swarna Shalaka, Panchdhatu Shalaka, Ayurveda.

INTRODUCTION

Ayurveda, the ancient science of life, emphasizes the maintenance of health and the treatment of diseases through various therapeutic modalities. Among these, Agnikarma has been described by Acharya Sushruta as an effective para-surgical procedure, particularly for disorders caused by aggravated Vata and Kapha dosha and Snayu-Asthi-Sandhi gat Vyadhi.¹ Owing to its Ushna, Sukshma, and Tikshna properties, Agnikarma alleviates pain, improves local circulation, and promotes healing.

Vatakantaka is one of the disorders described under Vata Vyadhi in Ayurvedic classics.² The term “Vatakantaka” is derived from the words “Vata” and “Kantaka,” indicating severe pricking pain caused by aggravated Vata dosha in the heel region. It is characterized by intense pain in the heel, tenderness, stiffness, and difficulty in walking. In modern medicine, Vatakantaka can be correlated with plantar fasciitis, a common musculoskeletal condition affecting the plantar fascia at its attachment to the calcaneus.

Plantar fasciitis is one of the most frequent causes of heel pain, affecting individuals who stand for prolonged periods, athletes, obese persons, and middle-aged adults. Repetitive stress, obesity, improper footwear, prolonged standing, and biomechanical abnormalities contribute to its development. The condition significantly impairs mobility and quality of life.

Conventional management of plantar fasciitis includes analgesics, non-steroidal anti-inflammatory drugs, physiotherapy, local steroid injections, orthotic support, and surgery in refractory cases. However, these treatment modalities may provide only temporary relief and are often associated with adverse effects and recurrence.

Agnikarma has been described in Ayurvedic literature as a superior treatment for painful musculoskeletal disorders, including Vata Kantaka. Traditionally, various materials such as Swarna Shalaka and Panchdhatu Shalaka are used for performing Agnikarma. Swarna Shalaka possesses excellent thermal conductivity and heat retention properties, while Panchdhatu Shalaka, composed of copper, iron, zinc, silver, and tin, offers an economical and easily available alternative. Although both types of Shalakas are widely used in clinical practice, comparative scientific evidence regarding their efficacy is limited. Therefore, the present study, entitled “A Comparative Clinical Study to Evaluate the Efficacy of Agnikarma with Swarna Shalaka and Panchdhatu Shalaka in the Management of Vata Kantaka,” was undertaken to evaluate and compare the therapeutic effects of these two instruments in the management of Vata Kantaka.

MATERIALS AND METHODS

Study Design

We carried out this prospective, non-randomized, open-label, interventional study in the Department of Shalya Tantra after obtaining institutional ethical clearance. After explaining the procedure in detail, provided informed written consent.

Source of Data

A total of 40 patients fulfilling the diagnostic and inclusion criteria of Vata Kantaka (Plantar Fasciitis) were selected from the Outpatient Department (OPD) of the institute after obtaining informed consent.

Grouping of Patients

The selected patients were non-randomly divided into two groups, each comprising 20 patients.

- Group A (n = 20): Agnikarma with Swarna Shalaka.
- Group B (n = 20): Agnikarma with Panchdhatu Shalaka.

In both group total duration of treatment was 28 days and during treatment there was total five sitting for seven days interval and post-trial follow up period once in every 15 days for one month.

Materials Used³

Swarna Shalaka

A specially designed Swarna Shalaka having a gold tip was used for performing Agnikarma in Group A.

Panchdhatu Shalaka

Panchdhatu Shalaka was purchased from an authorized manufacture and used for Agni karma in Group B.

Other Materials

- povidone-iodine solution.
- Sterile gauze pieces and cotton swabs.
- Gas stove
- Aloe vera pulp and Cow-Ghrita for post-procedure care.
- Sterile gloves and dressing materials.

Diagnostic Criteria

Patients presenting with the following signs and symptoms were diagnosed as suffering from Vata Kantaka:

- Heel pain, especially during the first step in the morning.
- Tenderness over the calcaneal region.
- Difficulty in walking and standing.
- Stiffness of the heel.

Inclusion Criteria –

In the present study patients were selected between the age Group 18-60 Years of both sexes with the symptoms of Vata Kantaka.

Exclusion Criteria: -

- Severe Anemic patient.
- Malnourish patient as per age, height of weight proportion.
- Patient with septicemia.
- The patient suffering from systemic disease such as osteomyelitis, calcaneal tumor, and anatomical deformity below ankle.
- Uncontrolled DM and HTN.
- Pregnancy and lactating mother.
- HIV and HBsAg Infection.

PROCEDURE OF AGNIKARMA⁴

1. Poorva Karma-

- To educate the patient about the procedure and was advised to take Pichchhila diet on the day of Agnikarma.⁵
- Informed written consent of the patient was taken.
- Appropriate comfortable position for the patient according to the site of pathogenesis in the plantar region.
- The local part of the patient was painted with povidone iodine solution. Painting with Betadine Solution before procedure

2. Pradhana Karma

- Agnikarma Shalaka (Swarna and Panchdhatu Shalaka) was red hot in smoke- free fire instrument (Gas Stove). Temperature required to became red hot by Swarna Shalaka was 495⁰c-515⁰c and by Panchdhatu Shalaka was 436⁰c - 450⁰c.

- At the site of most tender point Bindu type Agnikarma done till Samyak Dagdha symptoms appear.⁶
- 1/2 Angul (approx 1cm) space between two Samyak Dagdha was maintained.
- After each Samyak Dagdha pulp/gel of Ghrita Kumari was applied on Vrana to get rid of instant burning sensation.

3. Paschata Karma –

Apply of Sheet Veerya Draya Ghrita for ropan of Samyak Dagdha Vrana and it was covered with a sterilized gauze piece. After that bandaging on procedure site.⁷



(a)



(b)

Smayaka dagdha by Swarna Shalaka (a) and Panchdhatu Shalaka (b)



Temperature measured by pyrometer to become red hot

A) (Red hot swarna shalaka) (495°C – 515°C)

B) (Red hot Panchdhatu Shalaka) (436 °C- 450 °C)

ASSESSMENT CRITERIA: Subjective parameters -Pain, Tenderness and Restricted movement (morning stiffness)⁸

Objective parameters - CBC, RBS, HBsAg, HIV, X- ray Calcaneum region AP/ Lateral

Statistical analysis was performed using appropriate statistical tests. The Wilcoxon signed Ranked Test for within the group analysis and Mann-Whitney U Test were used for the analysis of study data. The result was expressed in suitable statistical terms, and a p-value of ≤ 0.05 was considered statistically significant.

OBSRVATIONS:

In the present study most of the patients presented with classical symptoms such as heel pain, tenderness over the calcaneal region, stiffness, and difficulty in walking. The severity of pain was found to be maximum during the first step in the morning and after prolonged periods of rest.

The observations of the present study played a significant role in understanding the demographic and clinical profile of patients with Vatakantaka (Plantar Fasciitis) and the factors associated with its occurrence. The majority of patients were females belonging to the 31–40 years age group, suggesting that middle-aged individuals are more commonly affected. Most participants were married, urban residents, and belonged to the lower middle socioeconomic class. Housewives and individuals with occupations involving prolonged standing or continuous physical activity constituted a major proportion of the study population.

Lifestyle-related factors such as lack of regular exercise, Analysis of body mass index showed that overweight and obese individuals constituted a major proportion of the study population, prolonged standing, and repetitive strain on the heel were frequently observed, indicating their possible contribution to the development of the disease. Most patients had a disease duration of 1–6 months, bilateral heel involvement, and calcaneal spur on X-ray, while Sama Agni and regular sleep were predominant according to Ayurvedic assessment. These observations suggest that demographic characteristics,

occupational stress, lifestyle habits, and mechanical loading of the heel are important contributing factors in Vatakantaka and provide a clinical basis for understanding the disease pattern and interpreting the therapeutic outcomes of Agnikarma with Swarna Shalaka and Panchdhatu Shalaka.

Majority of patients belonged to the moderate severity category for most clinical parameters, whereas fewer patients were in the mild or severe categories. This indicates that the study population had clinically significant symptoms before treatment, making them suitable for evaluating the therapeutic efficacy of Agni karma. Among the 40 patients included in the study, all completed the treatment protocol and follow-up period without any major complications or adverse effects. The treatment was well tolerated in both groups.

RESULT:

At before treatment, most patients in both groups had moderate to severe symptoms (G2–G3). Following Agnikarma therapy, symptom severity progressively decreased, with a gradual shift from higher grades (G3/G2) to lower grades (G1/G0). By Day 28, the majority of patients became symptom-free (G0), with Group A showing earlier improvement than Group B.

Both Group A (Swarna Shalaka) and Group B (Panchdhatu Shalaka) showed progressive improvement in all assessed symptoms—pain, tenderness, and restricted movement—throughout the treatment period. In both groups, the reduction in mean scores was statistically highly significant ($p < 0.001$) at almost all follow-up assessments. However, Group A demonstrated comparatively greater and faster improvement, achieving 100% relief in pain and restricted movement and 93.88% relief in tenderness by Day 28. Group B also showed marked improvement, with 93.88% relief in pain, 88.64% relief in tenderness, and 89.29% relief in restricted movement at the end of treatment. Overall, both interventions were effective, with Swarna Shalaka producing comparatively superior within-group clinical outcomes.

The intergroup comparison revealed that both Swarna Shalaka and Panchdhatu Shalaka were effective in reducing pain, tenderness, and restricted movement (morning stiffness) during the treatment period. For pain, no statistically significant difference was observed between the groups at Day 7 ($p=1.000$), Day 14 ($p=0.209$), or Day 28 ($p=0.060$). However, a statistically significant difference was noted at Day 21 ($Z=2.298$, $p=0.022$), with the Swarna Shalaka group showing greater pain relief (mean difference 2.45) than the Panchdhatu Shalaka group (mean difference 2.05).

For tenderness, although the Swarna Shalaka group demonstrated slightly higher mean improvement at all follow-up visits Days 7 ($P=0.097$), Day 14 ($p=0.281$), Day 21 ($p=0.059$) and Day 28 ($p=0.125$) the differences between the groups were statistically non-significant ($p>0.05$), indicating comparable efficacy of both treatments in reducing tenderness.

Regarding restricted movement (morning stiffness), a statistically significant difference was observed only at Day 14 ($Z=2.211$, $p=0.027$), where the Swarna Shalaka group showed greater improvement (mean difference 1.30) than the Panchdhatu Shalaka group (mean difference 0.90). At Days 7, 21, and 28, the intergroup differences were statistically non-significant ($p>0.05$).

Both Group A (Swarna Shalaka) and Group B (Panchdhatu Shalaka) showed statistically highly significant improvement from before treatment to the end of treatment in pain, tenderness, and restricted movement ($p < 0.001$), indicating that Agnikarma was effective within each group.

Comparison between the two groups showed no statistically significant difference at most follow-up visits. However, Group A demonstrated significantly better improvement in pain on Day 21 and in restricted movement on Day 14, while tenderness improvement remained statistically comparable between the groups.

Regarding therapeutic response, Group A (Swarna Shalaka) demonstrated better clinical improvement than Group B (Panchdhatu Shalaka). In Group A, complete relief was observed in 17 patients (85%), while 3 patients (15%) showed marked improvement. In Group B, complete relief was observed in 10 patients (50%), whereas 10 patients (50%) showed marked improvement.

Overall, both treatments were effective in reducing the severity of symptoms in patients with Vatakantaka (Plantar Fasciitis). Group A (Swarna Shalaka) produced comparatively faster and greater clinical improvement, achieving a higher rate of complete remission (85%) than Group B (50%), indicating superior overall therapeutic efficacy.

STATICAL ANALYSIS: -

Table no.1 Effect of therapy in patients of Group A (Swarna Shalaka)

Symptoms	Mean score		% relief	Z value	P value	Remark
	BT	AT				
Pain	2.60	0.00	100%	4.053	0.000	HS
Tenderness	2.45	0.15	93.88%	4.042	0.000	HS
Morning Stiffness	1.60	0.00	100%	4.021	0.000	HS

Table no.2 Effect of therapy in patients of Group B (Panchdhatu Shalaka)

Symptoms	Mean score		% relief	Z value	P value	Remark
	BT	AT				
Pain	2.45	0.15	93.88%	4.099	0.000	HS

Tenderness	2.20	0.25	88.64%	3.981	0.000	HS
Morning Stiffness	1.40	0.15	89.29%	3.852	0.000	HS

Table no.3 Assesment of relief of Pain in between the group

Pain	Mean		Z value	p value	Remark
	Swarna Shalaka	Panchdhatu Shalaka			
Difference at 7 Days	1.00	1.00	0.000	1.000	NS
Difference at 14 Days	1.65	1.45	1.255	0.209	NS
Difference at 21 Days	2.45	2.05	2.298	0.022	S
Difference at 28 Days	2.60	2.30	1.883	0.060	NS

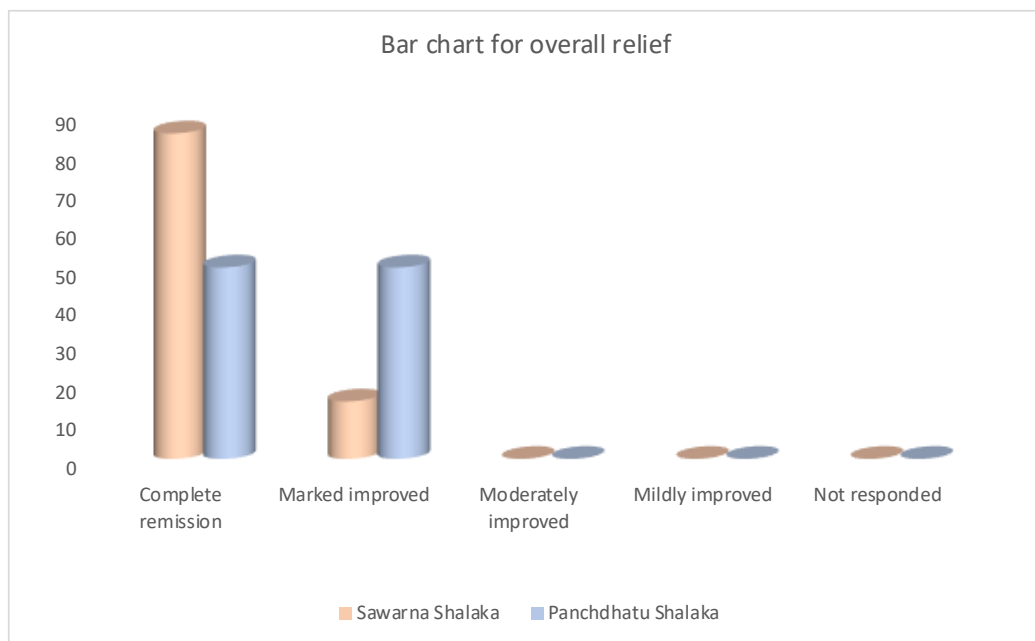
Table no.4 Assesment of relief of Tenderness between the group

Tenderness (On deep palpation)	Mean		Z value	p value	Remark
	Swarna Shalaka	Panchdhatu Shalaka			
Difference at 7 Days	1.00	0.80	1.658	0.097	NS
Difference at 14 Days	1.35	1.15	1.078	0.281	NS
Difference at 21 Days	1.80	1.40	1.885	0.059	NS
Difference at 28 Days	2.30	1.95	1.535	0.125	NS

Table no.5 Assesment of relief of Morning Stiffness between the group

Morning Stiffness (Restricted Movement)	Mean		Z value	p value	Remark
	Swarna Shalaka	Panchdhatu Shalaka			
Difference at 7 Days	0.65	0.35	1.873	0.061	NS
Difference at 14 Days	1.30	0.90	2.211	0.027	S
Difference at 21 Days	1.55	1.20	1.808	0.071	NS
Difference at 28 Days	1.60	1.25	1.589	0.112	NS

Table no.6 Overall relief of therapy



DISCUSSION:

Vatakantaka, described in the Ayurvedic classics as a Vata-dominant disorder affecting the heel region, closely resembles plantar fasciitis in terms of its clinical presentation, including heel pain, tenderness, morning stiffness, and difficulty in walking. Agnikarma, a para-surgical procedure advocated by Acharya Sushruta, has long been considered an effective treatment for disorders caused predominantly by aggravated Vata and Kapha Dosha. The present study was undertaken to

compare the therapeutic efficacy of Agnikarma performed with Swarna Shalaka and Panchdhatu Shalaka in the management of Vatakantaka.

The demographic profile of the study revealed that the majority of patients were females aged 31–40 years. Most participants were housewives, belonged to the lower middle socioeconomic group, and had occupations involving prolonged standing or continuous physical activity. Overweight, prolonged standing, lack of regular exercise, bilateral heel involvement, and calcaneal spur were frequently observed. These findings indicate that repetitive mechanical stress on the plantar fascia, along with Vata-aggravating factors such as Atichankramana (excessive walking), prolonged standing, and overuse of the heel, may contribute to the development of Vatakantaka.

Both treatment groups showed statistically highly significant improvement in pain, tenderness, and restricted movement throughout the treatment period ($p < 0.001$). Progressive reduction in symptoms severity was observed at each follow-up visit, demonstrating the effectiveness of Agnikarma in relieving the clinical manifestations of Vatakantaka. These findings support the classical Ayurvedic principle that Agnikarma is one of the most effective treatment modalities for painful musculoskeletal disorders caused by aggravated Vata Dosha.

The therapeutic effect of Agnikarma can be explained from both Ayurvedic and modern scientific perspectives. According to Ayurveda, the Ushna, Tikshna, and Sukshma properties of Agni pacify aggravated Vata and liquefy Kapha, thereby relieving pain, stiffness, and obstruction of channels (Srotorodha). The procedure also improves local Rakta circulation, nourishes the affected tissues, and promotes healing.⁹ From a modern viewpoint, controlled therapeutic heat increases local blood flow, enhances tissue metabolism, reduces muscle spasm, improves collagen extensibility, and accelerates tissue repair. Heat may also produce analgesia by stimulating cutaneous receptors, activating the gate control mechanism of pain, and promoting the release of endogenous opioids.¹⁰

Although both interventions produced excellent clinical outcomes, Agnikarma performed with Swarna Shalaka demonstrated comparatively greater therapeutic efficacy. Patients treated with Swarna Shalaka achieved faster reduction in pain and morning stiffness, with significantly better pain relief on Day 21 and significantly greater improvement in restricted movement on Day 14. By the end of treatment, complete remission was achieved in 85% of patients in the Swarna Shalaka group compared with 50% in the Panchdhatu Shalaka group, indicating superior overall clinical efficacy. The comparatively better outcome observed with Swarna Shalaka may be attributed to its superior thermal characteristics. In the present study, Swarna Shalaka attained a higher red-hot temperature (approximately 495–515°C) than Panchdhatu Shalaka (approximately 436–450°C), resulting in more efficient transfer of therapeutic heat to the affected tissue. Better heat retention and sustained thermal delivery may have enhanced local microcirculation, reduced pain and muscle spasm, improved tissue metabolism, and promoted faster healing. These thermal properties could explain the earlier and greater symptomatic relief observed with Swarna Shalaka. Nevertheless, Panchdhatu Shalaka also produced statistically highly significant improvement in all clinical parameters and remains an effective and economical alternative for Agnikarma.

No major adverse effects or complications were observed during the treatment or follow-up period. All patients completed the study successfully, and the procedure was well tolerated. These findings indicate that Agnikarma is a safe, minimally invasive, and cost-effective para-surgical procedure when performed using proper aseptic precautions and standardized techniques.

CONCLUSION

The present clinical study was undertaken to evaluate the therapeutic efficacy of Agnikarma using Swarna Shalaka and Panchdhatu Shalaka in the management of Vatakantaka (Plantar Fasciitis). A total of 40 patients were equally divided into two groups and assessed on the basis of pain, tenderness, and restricted movement (morning stiffness).

The findings of the present study indicate that Agnikarma is an effective therapeutic intervention for the management of Vatakantaka (Plantar Fasciitis). Both Swarna Shalaka and Panchdhatu Shalaka significantly reduced pain, tenderness, and restricted movement, leading to substantial clinical improvement. Comparative analysis revealed that patients treated with Swarna Shalaka experienced relatively greater and earlier symptomatic relief than those treated with Panchdhatu Shalaka, although both treatment modalities were effective. The absence of significant adverse effects throughout the study further supports the safety and feasibility of Agnikarma as a minimally invasive para-surgical procedure. Overall, the study suggests that Agnikarma, especially when performed with Swarna Shalaka, offers a reliable, economical, and clinically beneficial approach for the management of Vatakantaka. Further well-designed studies with larger sample sizes and extended follow-up are warranted to confirm these findings and establish broader clinical recommendations.

LIMITATIONS OF THE STUDY:

The main limitation of this study was the sample size relatively small (40 patients), which may limit the generalizability of the results. The study was conducted at a single center. The duration of follow-up was short, long-term outcomes and recurrence could not be assessed. Only patients meeting the inclusion criteria were included, limiting applicability to all cases of Vatakantaka. Advanced imaging and objective biomechanical assessment were not used to evaluate treatment outcomes.

SUGGESTIONS FOR FURTHER STUDY:

The main suggestions for further study is Conduct multicenter studies with a larger sample size. Include a longer follow-up period to evaluate recurrence and long-term efficacy. Compare Agnikarma with other conservative and modern treatment modalities. Evaluate different Shalakas and standardized temperature settings to optimize outcomes. Incorporate objective assessment tools such as imaging, gait analysis, or plantar pressure analysis. Assess patient-reported quality of life and cost-effectiveness after treatment.

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