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Research Article

A COMPARATIVE CLINICAL STUDY ON EFFECT OF *AGNIKARMA* AND *SIRAVEDHA* IN *VATA KANTAKA* W.S.R PLANTAR FASCIITIS

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ABSTRACT

Vatakantaka causes very severe pain in heal region. *Vata* gets aggravated and localised in *Khudapradesha* when person walks on unevenly or irregularly on surface. It causes difficulty to daily regular activities. It can be compared to Plantar Fasciitis as there will be stabbing (*Kantaka*) type of pain. Incidence is about 10% of the population, about 83% of these patients being actively working between age of 25-60 years. There is only conservative management for short term relief with certain draw backs and surgical management which increase hospital stay and high economical expenses. *Acharya Sushruta* described *Agnikarma* painful condition of *Twak, Mamsa, Sira, Snayu, Asthi Sandhi. Sushruta* also mentioned *Siravedha* of vein situated two *Angulas* (4cm) above the *Kshipramarma* in *Vatakantaka*. The study is aimed to compare efficacy of *Agnikarma* and *Siravedha* in *Vatakantaka* w.s.r plantar fasciitis. A total of 40 patients are selected and randomly divided into two groups, Group A *Agnikarma* in 20 patients and Group B *Siravedha* in 20 patients. Both group given relief in symptoms of *Vatakantaka*. Group A- *Agnikarma* (90.53%) and group- B *Siravedha* (88.31%) were significant in treating *Vatakantaka.* But *Agnikarma* is better effect then *Siravedha* in management of *Vatakantaka*. Both therapies can be done with less economical expenditure and minimum hospitalization.

INTRODUCTION

Vatakantaka is one of the diseases of *Vatavyadhi*. It is a disease which gives thorny pain in the foot associated with *Vata Kapha Dhusti* which interferes in doing day to day activities. The great Indian surgeon "*Sushruta*" (800BC) known as father of Surgery has described, *Vatakantaka* in *Vatavyadhi Nidhana*. While walking when the foot is placed unevenly on the ground, *Vata Dosa* is localized in *Khuda* (ankle) and aggravated and produce pain known as *Vatakantaka.*[1]

Acharya Vaghbata described that severe aching pain is perceived when, the foot is kept in unusual posture or when the local area is fatigued due to excess function, *Vatadosa* take chance and occupies the ankle joint and heel. It is called as *Vatakantaka.*[2,3]

In the later period, other authors like, *Vangasena*[4] and *Madhavakara*[5] also narrate the same.

Acharya Charaka mentioned the word *Vatakantaka* (affliction of ankle joint by *Vata*) in indications of *Sweda*[6]. He also explained *Padashula* (pain in foot) and *Gulphagraha* (ankle stiffness) in 80 types of *Vatajananatmaja vyadhis.*[7] *Nidana* of *Vatakantaka* is *Ruksha, Sheeta, Laghuahara* and excessive walk in bare foot.

Acharya Sushruta in *Agnikarma Vidhi Adhyaya* mentioned that *Agnikarma* can done in condition like, very severe pain in *Twak, Mamsa, Sira, Snayu, Asthi Sandhi*[8] and other treatment modalities like oleation, poultice, bandaging for management of *Vatakantaka*[9].

Acharya Sushruta also mentioned *Siravedha* in *Vatakantaka*, vein situated two *Angulas* (4cm) above the *Kshipramarma* (between big toe and next toe). *Siravedha* should done with *Vrihimukhasastra* (trocar, thick needle).[10]

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Bhava Parakasha mentioned Bloodletting may be done repeatedly in ankle area. *Erandataila* may be given internally, and cauterization with heated Iron neddles.[11]

In Modern context *Vatakantaka* is correlated with Plantar Fasciitis also called as police man's heel. Patient presented with heal pain in OPD mostly diagnosed as plantar fasciitis as it is the common cause. Plantar fascia is a fibrous Aponeurosis origin from calcaneus and divides into 5 digital bands and attaches to toes. Plantar fasciitis presents with pain while walking after prolonged period of rest usually after awaking up from sleep or prolonged sitting. Pain usually decreases after walking for some distance[12]. It can be managed with treatment like Physiotherapy, Stretching exercises, Shoe inserts, NSAIDS, Steroid injections. Surgically it can be managed by plantar fascia release based on requirement. But still gives the limited remedial measures.[13]

So, there is need of an economic, safe and effective treatment for this disease. Hence an attempt was made to evaluate the efficacy of *Siravyadha* in *Vatakantaka* and compare the same with the efficacy of *Agnikarma* with *Panchalohashalaka* which has been proved as efficacious by the previous work done.

Source of Collection of Data

Screening, Selection and Registration of 40 cases randomly from the OPD and IPD of Salya Tantra Unit, S.V. Ayurvedic Hospital, based upon Inclusive and Exclusive Criteria.

Inclusive Criteria

- Patients with age group of 25-60 years.
- Patients with classical signs and symptoms of *Vatakantaka* (Plantar Fasciitis).
- Patients irrespective of sex, occupation, economic status.

Exclusive Criteria

- Wounds & amp; Ulcer over foot
- Trauma of lower extremity
- Fractures of bones of leg and foot
- k/c/o Rheumatoid and Gouty disease of foot and ankle.
- Bleeding disorders
- Anemia
- Patients on anticoagulant therapy
- Diabetic mellitus
- Pregnancy and Lactation
- Infective pathology
- Other systemic disease

Assessment Criteria

The assessment of relief of sign and symptoms was after completion of treatment by following

- Pain
- Tenderness
- Windlass test
- Local swelling

Grades

Pain: No pain 0

- Mild pain - Can be ignored -2
- Moderate pain - Interfere with tasks -4
- Severe pain - Interferes with concentration- 6
- Very severe pain - Interferes with basic needs -8
- Worst pain possible - Bed rest required -10

Tenderness: Based on VAS[14]

- No tenderness - Says palpation is not painful even when asked about it -0
- Mild Tenderness - Says palpation is painful only when asked about it- 1
- Moderate tenderness - Indicates palpation is painful by wincing during palpation -2
- Severe tenderness - On palpation, tries to withdrawal the limb -3

Windlass test

Patient is made to stand on stool with toes of foot just off the edge of stool. The patient is instructed to place equal weight on both feet. By passive extension of great toe was done until complaints pain or to its end range. It causes the stretch of plantar fascia and reproduces pain.[15]

Negative windlass test: No pain- Alert & smiling 0

Positive windlass test: Heel pain reproduced with passive dorsiflexion of the toes. Pain during examination will be recorded based on VAS[14] scale in standing position in following grading:

- Mild pain – No humor, serious -2
- Moderate pain – Furrowed brows, breath holding, pursed lips -4
- Severe pain – Wrinkled nose, raised upper lip, rapid breathing- 6
- Very severe pain – Slow blink, open mouth- 8
- Worst pain - Eyes closed, crying- 10

Local Swelling

- No swelling – 0
- Mild swelling – 1
- Moderate swelling – 2
- Profuse swelling – 3

Investigations

- Haemoglobin%
- Clotting time
- Bleeding time
- Blood sugar
- Viral screening
- X-Ray foot AP and lateral

Diagnostic Criteria

Vatakantaka is Diagnosed based on history, signs and symptoms, examination.

Differential Diagnosis

Vatakantaka, Asthividhradhi (osteomyelitis), *Sandhigatavata* (osteoarthritis), calcaneal spur, Calcaneal fracture. Based on X-ray foot AP and lateral above condition are ruled out.

Treatment plan

A total 40 patients were selected randomly for study. They were divided into two Groups of 20 patients each

- **Group A:** Selected patients were treated with *Agnikarma.* 04 sittings were done 1st, 7th, 14th, and 21st day
- **Group B:** Selected patients were treated with *Siravedha*. 04 sittings were 1st, 7th, 14th, and 21st day
- **Follow up:** active follow up after 15 days of treatment and general follow up to 2months. Before treatment and after treatment parameters assessed.

The procedures in both groups were conducted at minor OT of department of PG studies in *Shalyatantra* S. V. Ayurvedic Hospital, Tirupati.

MATERIAL AND METHODS

Material

Agnikarma: Swabs, Gas stove, *Kumari* pulp (Aloe barbadensis Mill.), *Grita (*ghee*), Madhu (*honey*)*, sterile towel, sterile gloves, *Shalaka* (rod like instrument), Marker pen, Sponge holding forceps and kidney tray.

Siravedha: Gauze piece, Swabs, Bandages, tourniquet, instrument tray, kidney trays, scalp vein (no. 20), 20ml syringe, spirit, betadine solution or *Panchavalkala Kwatha,* chairs, dressing table.

Clinical Method

Procedure of *Agnikarma*

***Purvakarma*:**

Required materials for procedure of *Agnikarma* were collected. The procedure was explained in detail and taken consent from the patient. *Shalaka* is placed on the gas stove to become red hot. The Ankle joint is painted with *Triphala Kashayam* and wiped with dry sterile cotton. The selected part is cleaned. 5 to 6 points will be marked at a distance of 1 to 2cm superiorly along and around the ankle joint and planter surface where ever patient got more tenderness during examination. *Kumari* pulp (Aloe barbadensis Mill.) was rubbed over the marked area for 2 to 3 minutes for producing anesthetic effect.

Pradhanakarma

This is the procedure of doing *Agnikarma*. The *Shalaka* is heated by placing it on fire. Here the heating procedure (dry heat) can be considered as sterilization method also. After *Shalaka* becoming to red hot, *Agnikarma* was done at 5 to 6 consecutive points around the ankle joint and Planter surface where there is more tenderness with minimum distance of 1 to 2cm.

Paschatkarma

Admixture of honey and ghee is applied over burnt part. Then it is covered with sterile gauze to avoid contamination. Patients are advised to avoid contact with water over the burnt part. Active follow up after 15 days of treatment and general follow up to 2 months.

Fig: 1 Materials of *Agnikarma* Fig: 2 Red hot *Shalaka*

Fig: 3 *Agnikarma Bindhu Dhagdhavishesha* procedure **Fig: 4 After *Agnikarma***

Siravedha

Purvakarma

Required materials for procedure of *Siravedha* were collected. Then patient was anointed (*Snehana*) with oily preparations and duly fomented (*Swedana*). Liquid food or diet consisting of food items which are antidotal to the bodily principles (*Doshas*) or *Yavagu* (gruel) was given to patient at first. Informed written consent of the patient before going to *Siravedha* was taken. Temperature – Pulse – Respiration and Blood pressure were normal.

Pradhana Karma

At suitable time, He was asked to sit nearby in erect posture; the part proximal to the puncture site was tied with tourniquet. Scalp vein (20 No) is taken. Then the scalp vein properly placed into the prominent vein around and below the ankle joint and connected the syringe. Slowly withdrawn the blood into syringe; amount of blood withdrawn was 20ml in each sitting. After completion of withdrawal of the blood, the Scalp vein was remove from the vein and placed a cotton ball over the punctured site with pressure to arrest the bleeding.

Pashchat Karma

After *Samyak Raktamokshana*, the blood on surrounding area was cleaned with betadine and normal saline. Tight dressing was applied on the wound to arrest the further bleeding. Patient advised to take rest on the bed with foot end elevation.

Fig: 5 Materials of *Siravedha* **Fig: 6 Application of tourniquet** **Fig: 7 Procedure of *Siravedha***

OBSERVATION AND RESULTS

In this study total 40 patients of *Vatakantaka* were selected and randomly assigned in two groups namely Group A and Group B with 20 patients each. Each patient was observed thoroughly and noted. The observations were recorded and necessary charts and graphs were made.

Distribution of Patients Based on Age

Table1: Distribution of patients according to Age (Years)

Age(Years)	Group A		Group B	
	No. of Patients	Percentage	No. of Patients	Percentage
26 - 30	1	5.0	0	0
31– 35	2	10.0	6	30.0
36 – 40	5	25.0	4	20.0
41 – 45	5	25.0	1	5.0
46 - 50	3	15.0	3	15.0

51 - 55	2	10.0	4	20.0
56 - 60	2	10.0	2	10.0
Total	20	100.0	20	100.0

Distribution of Patients Based on Gender

Table 2: Distribution of patients according to Gender

Gender	Group A		Group B	
	No. of Patients	Percentage	No. of Patients	Percentage
Female	12	60.0	06	30.0
Male	08	40.0	14	70.0
Total	20	100.0	20	100.0

Distribution of Patients Based on BMI

Table 3: Distribution of patients based on BMI

BMI	Group A		Group B	
	No. of Patients	Percentage	No. of Patients	Percentage
Normal: 18.5-24.9	2	10.0	4	20.0
Overweight: 25-29.9	7	35.0	8	40.0
Obese class: I 30-34.9	9	45.0	7	35.0
Obese class II: 35.0-39.9	2	10.0	1	5.0
Total	20	100	20	100

Distribution of Patients Based on Choronicity

Table 4: Distribution of patients based on Chronicity

Chronicity	Group A		Group B	
	No. of Patients	Percentage	No. of Patients	Percentage
< 6months	13	65.0	15	75.0
6-12 month	5	25.0	2	10.0
>1 year	2	10.0	3	15.0
Total	20	100.0	20	100.0

Distribution of Patients Based Occupation

Table 5: Distribution of patients according to Occupation

Occupation	Group A		Group B	
	No. o Patients	Percentage	No. of Patients	Percentage
Business	4	20.0	5	25.0
Employee	1	5.0	1	5.0
Farmer	3	15.0	6	30.0
Housewife	9	45.0	6	30.0
Student	1	5.0	0	0.0
Teacher	2	10.0	2	10.0
Total	20	100.0	20	100.0

Overall Results

Table 6: Showing statistical of parameter in group I

Parameter	Mean		Mean diff	S. D		S. E		t value	P value
	BT	AT		BT	AT	BT	AT		
Pain	2.7	0.3	2.4	0.47	0.47	0.11	0.11	17.941	0.0001
Swelling	0	0	0	0	0	0	0	0	0
Tenderness	1.90	0.20	1.7	0.55	0.41	0.12	0.09	16.170	0.0001
Windlass test	2.75	0.35	2.4	0.44	0.49	0.10	0.11	15.771	0.0001

- **Pain:** The statistical analysis revealed that the mean score before the treatment was 2.70 and it was reduced to 0.3 after the treatment. This change is statistically significant with p<0.0001.
- **Swelling:** Swelling was not seen in any patient.
- **Tenderness:** The statistical analysis revealed that the mean score before the treatment was 1.90 and it was reduced to 0.2 after the treatment. This change is statistically significant with p<0.0001.
- **Windlass test:** The statistical analysis revealed that the mean score before the treatment was 2.75 and it was reduced to 0.35 after the treatment. This change is statistically significant with p<0.0001.
- **Over all result:** The statistical analysis revealed that the mean score before the treatment was 7.35 and it was reduced to 0.85 after the treatment. This change is statistically significant with p<0.0001.

Table 7: Showing statistical of parameter in Group II

Parameter	Mean		Mean diff	S. D		S. E		t value	P value
	BT	AT		BT	AT	BT	AT		
Pain	2.75	0.4	2.35	0.44	0.50	0.09	0.11	21.476	0.0001
Swelling	0	0	0	0	0	0	0	0	0
Tenderness	1.95	0.25	1.70	0.51	0.44	0.11	0.09	16.170	0.0001
Windlass test	2.85	0.4	2.45	0.36	0.50	0.08	0.11	21.466	0.0001

- **Pain:** The statistical analysis revealed that the mean score before the treatment was 2.75 and it was reduced to 0.4 after the treatment. This change is statistically significant with p<0.0001.
- **Swelling:** Swelling was not seen in any patient.
- **Tenderness:** The statistical analysis revealed that the mean score before the treatment was 1.95 and it was reduced to 0.25 after the treatment. This change is statistically significant with p<0.0001.
- **Windlass test:** The statistical analysis revealed that the mean score before the treatment was 2.85 and it was reduced to 0.5 after the treatment. This change is statistically significant with p<0.0001.
- **Over all result:** The statistical analysis revealed that the mean score before the treatment was 7.55 and it was reduced to 1.10 after the treatment. This change is statistically significant with p<0.0001.

Table 8: showing compression statistical of parameter in group A and group B

Parameter	Mean		Mean diff	S. D		S. E		t value	P value
	G - A	G - B		G - A	G - B	G -A	G - B		
Pain	2.40	2.35	0.5	0.60	0.49	0.13	0.11	0.252	0.8037
Swelling	0	0	0	0	0	0	0	0	0
Tenderness	1.70	1.70	0	0.47	0.47	0.11	0.11	0.000	1.0000
Windlass test	2.40	2.35	0.5	0.68	0.49	0.15	0.11	0.294	0.7715
Over all result	6.50	6.40	0.10	0.95	1.14	0.21	0.26	0.282	0.7810

- **Pain:** The statistical analysis revealed that the mean score of Group A was 2.40 and Group B was 2.35. This difference is considered to be not statistically significant with p=0.8037.
- **Swelling:** Swelling was not seen in any patient.
- **Tenderness:** The statistical analysis revealed that the mean score of Group A was 1.70 and Group B was 1.70. This difference is considered to be not statistically significant with p=1.0000.
- **Windlass test:** The statistical analysis revealed that the mean score of Group A was 2.40 and Group B was 2.35. This difference is considered to be not statistically significant with p=0.7715
- **Over all result:** The statistical analysis revealed that the mean score of Group A was 6.50 and Group B was 6.40. This difference is considered to be not statistically significant with p=0.7810

DISCUSSION

Discussion on Disease

Vatakantaka is predominantly caused by vitiation of *Vata* associated with *Kapha* in heal and cause pain, stiffness, and *Shotha*. In both the sciences, the commonly seen factor causing the disease is more pressure over the arch of the foot leading to the stretching and inflammation of plantar fascia. The main symptom it is defined as sharp pain on the plantar surface of the heel. Sharp pain in the heel is something like pin pricking. The word *Kantaka* correlates with thorn, and in *Vatakantaka* there is thorny pain in the heel. So, based on above factors it is appropriate to correlate *Vatakantaka* to Plantar fasciitis.

Discussion on *Agnikarma*

Agnikarma is an important *Anushastra karma* (para surgical procedure) elaborately described in the *Sushruta samhita*. While elaborating the benefits of this procedure, *Sushruta* mentioned that it is easy to perform, effective in many incurable diseases and which has no reoccurrence of the diseases, including severe pain in *Asthi* (bones) and *Sandhi* (joints) *Pradesh*.[16]

Discussion on *Siravedha*

Siravedha is a type of *Raktamokshana* elaborately described in the *Sushruta samhita*. While elaborating the benefits of this procedure, Acharya *Sushruta* explained *Siravedha* as, a half treatment just like *Vasti* in the *Kayachikitsa*[17]. *Acharya Sushruta* also mentioned that in disease such as *Vatakantaka*, *Padadaha, Padaharsha, Vatasonita, Chippa, Visarpa, Vicarcika, Padadari*etc, vein situated two *Angulas* (4cm) above the *Kshipramarma* (between big toe and next toe). *Siravedha* should done with *Vrihimukhasastra* (trocar, thick needle).[10]

Discussion on Results

Pain: After treatment, Pain was relieved and there was 89% improvement observed in patients of Group A and 86% in patients of Group B. Thus, significant improvement was observed in both groups.

Swelling: Swelling of the foot was not seen in any of the patients of either groups as the inflammation of the plantar fascia does not cause any swelling or change in dimensions locally.

Tenderness: After treatment, Tenderness was relieved and there was 91% improvement observed in patients of Group A and 89% in patients of Group B. Thus, significant improvement was observed in both groups.

Windlass Test: After treatment, on doing windlass test pain was relieved considerably and there was 86.65% improvement observed in patients of Group A and 83.3% improvement in patients of Group B. Thus, significant improvement was observed in both groups.

Table 9: Showing comparative results in percentage in group A and group B

Parameter	Group A	Group B
Pain	89%	86%
Swelling	0	0
Tenderness	91%	89%
Windlass Test	86.65%	83.3%

Probable Mode of Action of *Agnikarma*

- *Shalaka* made into red hot and placed on the skin to made *Samyak Dagdha Bindhuvat Vrana* by which heat transferred to local site. The *Ushna, Tikshna, Laghu, Sukshma, Vyavayi, Vikashi* and *Ashukari* properties of *Agni* helps to remove the *Srotavarodha* (obstruction of channels), pacifies the vitiated *Vata Kapha Dosha* and maintains their equilibrium thus break the *Samprapti* (pathology).
- By inducing heat to ankle joint causes vasodilatation which increases blood circulation, leading to increased blood flow to the ankle and also increase the venous return which flush away the metabolic waste from ankle. It will decrease pressure on nerve ending and there by decrease the pain and also enhances the natural process of repair.
- By inducing heat will improve local metabolism. This will increase the demand of oxygen and nutrients to the tissue which will enhance the natural process of healing
- Lateral spinothalamic tract (ascending neurons)[18] are the pathway for conduction of pain and temperature, pressure by ventral spinothalamic tract. When perception of pressure and temperature factors is increased, pain perception is reduced because only stronger sensation one can felt by brain.
- By inducing heat cause irritation of sensory nerve endings, which relives pain by counter irritation.

Probable Mode of Action of *Siravedha*

- *Rakta*, the blood transport absorbed nutrients, oxygen, metabolites etc. from place to place. By removing vitiated blood, fresh blood will rich the area with rich nutrients which will enhances the process of healing.
- *Vatakantaka* is caused by obstruction (*Avarana*) to *Vata* and *Kapha* in ankle joint and get vitiated causes severe pain in foot. By doing *Raktamokshana, Vata*, *Pitta*, *Kapha* comes out from the site along with *Rakta*. Thus relives the obstruction by removing vitiated *Vata* and *Kapha* occurs. Normal circulation will be restored and thus pain will relived.

CONCLUSION

- Results of *Agnikarma* were highly significant in relieving pain, tenderness, and pain while doing windlass test of *Vatakantaka* (plantar fasciitis) with p value of 0.0001.
- Results of *Siravedha* also were highly significant in relieving pain, tenderness, and pain while doing windlass test of *Vatakantaka* (plantar fasciitis) with p value of 0.0001.
- Both the methods of treatment proved to be effective in the management of *Vatakantaka*. But comparatively *Agnikarma* had slight better results.
- As both *Agnikarma* and *Siravedha* were showing the significant results, the difference of

effectiveness between these groups was not significant.

- The procedures in both the groups i.e., "*Agnikarma*" and "*Siravedha*" which was simple, economical, and did not require hospitalization and it could be carried out at OPD level itself.

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