



Research Article

A COMPARATIVE STUDY ON THE EFFICACY OF AGNIKARMA AND SIRAVYADHA IN THE MANAGEMENT OF GRIDHRASI (SCIATICA)**Kalpitha E^{1*}, S. Ahalya²**¹P.G. Scholar, ²Guide and Professor, Post Graduate Studies in Shalyatantra, Govt. Ayurvedic Medical College, Bengaluru, Karnataka, India.**Article info****Article History:**

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KEYWORDS: *Gridhrasi*, *Sciatica*, *Agnikarma*, *Siravyadha*.**ABSTRACT**

Gridhrasi (Sciatica) is one of the *Vataja Nanatmaja Vyadhi*, caused by aggravated *Vayu*, the hip is afflicted by stiffness, pain, pricking sensation in the waist, back, thigh, knee and calf regions along the passage of sciatic nerve which makes the patient difficult to walk which hampers the individual's daily routines. **Aim:** The present study was taken up with the objective of evaluating the efficacy of *Agnikarma* (treatment done with cauterization) and *Siravyadha* (Bloodletting with Venipuncture) in the management of *Gridhrasi*. **Materials and Methods:** The study was performed in comparative clinical randomized two groups parallel study with 40 *Gridhrasi* i.e., 20 patients in Group A (Patients were subjected to *Agnikarma* twice with an interval of 15 days) and 20 patients in Group B (Patients were subjected to *Siravyadha* twice with interval of 15 days). **Results:** In Group A out of 20 patients after the completion of treatment 10 patients were markedly improved, 5 moderately improved, and 5 reported mild improvement. In Group B out of 20 patients after the completion of treatment 1 were markedly improved, 7 reported moderate improvement, and in 12 patients reports mild improvement. *Agnikarma* is effective in both acute and chronic cases and provides quick results in relieving *Ruk* (100%), *Toda* (85%), *Sthamba* (90%), *Spandana* (65%). *Siravyadha* is effective in acute cases and provides gradual & effective results in relieving *Ruk* (90%), *Toda* (85%), *Sthamba* (60%), *Spandana* (65%). Statically both the groups showed significant changes making SLR and Bragard's negative sign better in Group A. Marked response is significantly more in Group A with P value- 0.004** which is highly significant. **Conclusion:** *Agnikarma* is effective in both acute and chronic cases and provides quick results; *Siravyadha* is effective in acute cases and provides gradual & effective results in relieving *Gridhrasi*.

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INTRODUCTION

Gridhrasi is included in *Vataja Nanatmaja Vyadhi*^[1], it is included in *Vataja Nanatmaja Vyadhi*, in general *Vata Prakopaka hetus* are to be considered.

Gridhrasi caused by aggravated *Vayu*, the hip is afflicted by stiffness, pain and pricking sensation in the waist, back, thigh, knee and calf region. All these organs get twitching sensation frequently.^[2,3]

Gridhrasi was caused due to lifting heavy weights and travelling. These causes coincide with the etiological factors mentioned in our classics, such as *Bharaharana* (weight lifting) and *Yaana* (travelling).^[4]

On the basis of symptoms *Gridhrasi* can be equated with the disease *Sciatica* in modern parlance, which occurs because of spinal nerve irritation and

characterized by its distinct nature of pain in distribution of sciatic nerve and often it is associated with lumbago. The disease *Gridhrasi* is commonly seen in society as a prominent problem; in this condition patient become incapable to do his daily routine work because of severe pain from *Kati pradesha* (lumbar) to *Padanguli* (foot). In various *Samhitas* of Ayurveda, references are given regarding *Gridhrasi* and it is elaborated as a separate disease with specific management.

In Ayurvedic texts, there are various methods used as a line of treatment, some of which are effective, simple, safe and cheap for the patients viz.,

- *Agnikarma*^[5]
- *Siravyadha*^[6]

- *Basti Karma*^[7]
- *Snehana*
- *Swedana*
- Oral medication

Siravyadha is accepted as half of the therapeutic measures in *Shalyatantra*^[8] like *Basti*^[9,10] in *Kayachikitsa*. *Siravyadha* has been one of the most commonly used procedures among various methods described in Indian Classical Surgery which is taken as established study in this work.

Stambha and *Ruk*, the predominant symptoms of *Gridhrasi* which disturbs the normal routine of the patient are effectively relieved by the *Agnikarma*.

Agnikarma therapy shows highly significant results in nearly all signs & symptoms, especially in case of pain as it is one of the most uncomfortable factors for patient.^[11]

Siravyadha (Venepuncture) and *Agnikarma* gives relief spontaneously in the cardinal symptoms of *Gridhrasi*.^[12]

The management of *Gridhrasi Agnikarma*^[13] and *Siravedha*^[14] procedures are useful in reducing pain.

Agnikarma to *Padakanistika*^[15-17] and *Antarakandara gulfa* are been taken in previous dissertation works. Here the study was planned with sincere effort to evaluate the efficacy of *Agnikarma* in 5 different points along the course of Sciatic nerve comparing it with *Siravyadha* which had been taken up in previous dissertation works.

Agnikarma and *Siravyadha* are the treatment modalities as *Lakshnika Chikitsa*, whereas *Basti* as *Vyadhihara Chikitsa*. Hence this study aimed at comparing two *Lakshnika Chikitsa* modalities *Agnikarma* and *Siravyadha* in this study.

AIM

A Comparative Study on the Efficacy of *Agnikarma* and *Siravyadha* in the Management of *Gridhrasi* (Sciatica).

OBJECTIVES

1. To evaluate the efficacy of *Agnikarma* in the management of *Gridhrasi* w.s.r. to Sciatica.
2. To evaluate the efficacy of *Siravyadha* in the management of *Gridhrasi* w.s.r. to Sciatica.
3. To evaluate the comparative efficacies of *Agnikarma* and *Siravyadha* in the management of *Gridhrasi* w.s.r. to Sciatica.

MATERIALS AND METHODS

Source of data

Patients suffering from *Gridhrasi* attending the Outpatient and Inpatient at Government Ayurvedic Medical College and SJIIM hospital, Bengaluru during November 2012 to April 2014.

Method of collection of data

40 patients suffering from classical features of *Gridhrasi* which is correlated with Sciatica namely pain in the low back radiating to the buttock, thigh, calf and toe, along with stiffness and twitching sensation and confirmed by positive SLR test and positive Bragard's sign, were selected for the study.

Materials used for *Agnikarma* (Figure 1)

- Cotton swabs sufficient number
- Sponge holding forceps 1
- Gas stove with lighter 1 set
- Marker pen 1
- *Madhu* 100gms
- *Grutha* 100gms
- *Panchaloha Shalaka*

Details of *Panchaloha Shalaka*

Materials used Proportion

- *Tamra* 40%
- *Loha* 30%
- *Yashada* 10%
- *Rajata* 10%
- *Vanga* 10%

Total length of the *Shalaka* 8cms

Diameter of the tip of the *Shalaka* 1mm

Total length of the handle 24.5cms

Weight of the *Shalaka* 150gms

SIRAVYADHA

Materials used for *Siravyadha* (Figure 3)

- Disposable needle 18
- gauze-QS
- Tourniquet-1
- Sterile glove-no.6- QS
- Sterile cotton-QS
- Cotton pads -QS
- Surgical spirit-QS
- Sterile bandage cloth-QS
- Measuring jar-1
- *Tila taila*- QS
- Steamer- 1

Criteria for selection of cases

A) Diagnostic Criteria

Patient with signs and symptoms of *Gridhrasi* were taken for the study.

- Presence of *Ruk*, *Toda*, *Stambha* and *Spandana* in the *Sphik*, *Kati*, *Uru*, *Janu*, *Jangha*, and *Pada*.
- Positive SLR test.
- Positive Bragard's sign.
- Patient with Chronicity upto 1year.

B) Inclusion Criteria

- Patient with features of *Gridhrasi* namely *Ruk* (continuous pain), *Toda* (intermittent pain), *Stambha* (stiffness), *Spandana* (twitching) over *Sphik, Kati, Prishtha, Uru, Janu, Jangha* extending up to *Pada*.
- Positive SLR test.
- Positive Bragard's sign.
- Patient with Chronicity upto 1 year.

C) Exclusion Criteria

- Patient with other systemic disorder which will come in the way of treatment.
- Patient with traumatic paraplegia, paraplegia, hemiplegia, bowel & bladder incontinence.
- Patient with history of Compression fracture, Lumbar canal stenosis, 3rd & 4th degree disc prolapse.
- Patient aged below 16 years and above 65 years.
- *Agnikarmaanarha*
- *Siravyadhaanarha*

Note: The pathological conditions mentioned in exclusion criteria were ruled out after considering the features and required investigations.

ASSESSMENT CRITERIA

Subjective parameters and Objective parameters were assessed looking at the clinical response in both the Groups. The patients were assessed on 1st day (before starting the treatment), 16th day (before 2nd sitting) and on the 31st day (after completion of treatment). The effect of 1st days treatment was assessed on 16th day before 2nd sitting, 2nd sittings effect was assessed on 31st day which was fixed as observational day.

Subjective Parameters

Pain was graded on the basis of Visual Analogue Scale (VAS). For this, a 20 cm long line was drawn, one end of which indicates no pain and another side indicates the pain as bad it can be. The patient is asked to mark their pain levels on the line (VAS) against the number corresponding to severity of pain felt by the patient. The scores thus obtained were given grading as follows.

Ruk (pain)

No pain	-	0
Trivial pain	-	1
Mild pain	-	2
Moderate pain	-	3
Severe pain	-	4

Toda (intermittent pain)

No Intermittent 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

Stambha (Stiffness)

Absent	-	0
Present	-	1

Spandana (twitching sensation)

Absent	-	0
Present	-	1

Objective parameters

Straight leg raising test - (between 30 - 70 degree)

Above 70 degree	-	0
60 - 70 degree	-	1
50 - 60 degree	-	2
40 - 50 degree	-	3
30 - 40 degree	-	4

Bragard's Test

Absent	-	0
Present	-	1

Assessment of overall effect

Completely relieved	-	100 % relief
Marked response	-	More than 75% relief
Moderate response	-	50 to 75 % relief
Mild response	-	25-49 % relief
Poor response	-	Below 25 % relief

Study design

A total of 40 patients suffering from *Gridhrasi* (*Sciatica*) were selected for the study. They were divided into two groups of 20 patients each as Group-A & Group-B.

Group-A: The patients under this group were treated by *Agnikarma*.

Group-B: The patients under this group were treated by *Siravyadha*.

PROCEDURE IN GROUP A

AGNIKARMA

Poorva karma

Procedure was explained to patient in advance and written consent was taken.

The patient was made to lie in prone position over the minor OT table. The affected limb was exposed from lower half of the back to toe, 5 points fixed at low back, mid buttock, mid-thigh, mid-calf and plantar aspect of little toe were marked with the marker.

Pradhana karma

The *Panchaloha Shalaka* was heated to red hot over the flame of the gas stove. The Staff Nurse was advised to hold the affected limb in suitable position. Later *Agnikarma* was performed with Red Hot *Shalaka* in *Binduakriti* at marked points in such a way that *Samyakdagdha lakshanas* were observed. (Figure 2)

Paschat karma

Immediately after *Agnikarma*, the *Goghrita* and *Madhu* which were thoroughly mixed in equal quantities in a glass jar was applied over the site of *Agnikarma* with the help of a sterile gauze piece. The patient was advised not to expose the area to water where *Agnikarma* was performed for 1 day and to keep the area clean and dry till it heals.

Number of sittings

First sitting was done on 1st day, after 15 days 2nd sitting of *Agnikarma* was performed on 16th day. 2 sittings of *Agnikarma* were conducted on all patients during the course of study. Observations were recorded on 1st day (BT) on 16th day (before 2nd sitting) and on 31st day (AT).

Follow up: In cases where total relief was obtained duration of 60 days was fixed to observe the possibility of recurrence. The same was recorded in the proforma.

PROCEDURE IN GROUP B

SIRAVYADHA

Poorvakarma

Procedure was explained to patient in advance and written consent was taken.

Yavagupaana – Patients were advised to have adequate quantity (120 ml) of *Tila yavagu pana* before undergoing *Siravyadhana*.

Abhyanga and Sweda: *Abhyanga* with *Tilataila* to the affected limb gently and followed by *Sthanika Nadisweda* for 3-5min was given.

Pradhana karma

The Patient was made to sit comfortably over the examination table with legs hanging down. Then the part (Prominent *Sira* at *Antarakandaragulpha*) was cleaned with surgical spirit. A tourniquet was tied, above the ankle joint to make the *Sira* prominent and if essential, mild blow was given over the *Sira*. The sterile needle of 18 gauge no. was introduced into the *Sira* (vein). When the needle was in situ a measuring jar is kept for collection of blood. The needle is taken out after the blood flow stops on its own or collected blood measures 200 ml. (Figure 4)

Paschat Karma

After letting out blood, the needle was taken out and sterile cotton pad was kept and bandaged. The patient was asked to take rest for 10-15 minutes. And patients were advised to have *Gudapana* of 200ml on the day after *Siravyadha*.

Number of sittings

First sitting was done on 1st day, after 15 days 2nd sitting of *Siravyadha* was performed on 16th day. 2 sittings of *Siravyadha* were conducted on all patients during the course of study. Observations were recorded

on 1st day (BT) on 16th day (before 2nd sitting) and on 31st day (AT).

Follow up: In cases where total relief was obtained duration of 60 days was fixed to observe the possibility of recurrence. The same was recorded in the proforma.

OBSERVATIONS AND RESULTS

Study design: A Comparative clinical randomized two groups parallel study with 40 patients with *Gridhrasi* randomized in two groups, 20 patients in Group A (Patients were subjected to *Agnikarma* twice with an interval of 15 days) and 20 patients in Group B (Patients were subjected to *Siravyadha* twice with interval of 15 days) is undertaken to study the efficacy of *Agnikarma*s in the management of *Gridhrasi* w.s.r to *Sciatica*, the efficacy of *Siravyadha* in the management of *Gridhrasi* w.s.r to *Sciatica* and comparative efficacies of *Agnikarma* and *Siravyadha* in the management of *Gridhrasi* w.s.r to *Sciatica*.

First sitting was done on 1st day, after 14 days 2nd sitting of *Agnikarma* was performed. 2 sittings of *Agnikarma* were conducted on all patients during the course of study. Observations were recorded on 1st day (before treatment) on 16th day (before 2nd sitting) and on 31st day (after completion of treatment).

Study design: A Comparative two group clinical study.

Age: Following table shows the age distribution of patients suffering from *Gridhrasi* (*Sciatica*).

Table 1: Age wise distribution of patients

Age in years	Group A		Group B	
	No	%	No	%
<30	3	15.0	2	10.0
31-40	5	25.0	8	40.0
41-50	8	40.0	6	30.0
51-60	4	20.0	3	15.0
>60	0	0.0	1	5.0
Total	20	100.0	20	100.0
Mean ± SD	42.10±10.58		42.00±11.21	

Samples are age matched with P=0.977

Sex: Following table shows the gender distribution of patients suffering from *Gridhrasi* (*Sciatica*).

Table 2: Gender wise distribution of patients

Gender	Group A		Group B	
	No	%	No	%
Female	10	50.0	7	35.0
Male	10	50.0	13	65.0
Total	20	100.0	20	100.0

Samples are gender matched with P=0.337

Chronicity: Following table shows the Chronicity of patients suffering from *Gridhrasi* (*Sciatica*).

Table 3: Chronicity of patients

Chronicity	Group A		Group B	
	No	%	No	%
<1 months	3	15.0	1	5.0
1-3 months	5	25.0	2	10.0
3-6 months	7	35.0	11	55.0
6-12 months	5	25.0	6	30.0
Total	20	100.0	20	100.0

Chronicity is statistically similar in two groups with p=0.408

Affected limb: Following table shows the affect of limb on patients suffering from *Gridhrasi* (Sciatica).

Table 4: Affect of Limb in two groups

Affected side	Group A		Group B	
	No	%	No	%
Left	11	55.0	9	45.0
Right	9	45.0	11	55.0
Total	20	100.0	20	100.0

Distribution of affected side is statistically similar with P=0.527

Ruk (pain): Following table shows the pain comparison between two groups of patients during the follow-up.

Table 5: Comparison of Ruk (pain) between two groups of patients

Ruk	1 st day	16 th day	31 st day	% change
Group A				
Absent	0(0%)	1(5%)	12(60%)	60.0%
Grade I	0(0%)	5(25%)	8(40%)	40.0%
Grade II	9(45%)	11(55%)	0(0%)	-45.0%
Grade III	11(55%)	3(15%)	0(0%)	-55.0%
Group B				
Absent	0(0%)	1(5%)	6(30%)	30.0%
Grade I	0(0%)	3(15%)	12(60%)	60.0%
Grade II	9(45%)	14(70%)	1(5%)	-40.0%
Grade III	11(55%)	2(10%)	1(5%)	-50.0%
P value	1.000	0.810	0.111	-

Toda (intermittent pain): Following table shows the intermittent pain comparison between two groups of patients during the follow-up.

Table 6: Comparison of evaluation of Toda (intermittent pain) between two groups studied

Toda	1 st day (n=20)	16 th day (n=20)	31 th day (n=20)	% change
Group A				
Absent	2(10%)	4(20%)	16(80%)	70.0%
Grade I	1(5%)	9(45%)	4(20%)	15.0%
Grade II	8(40%)	6(30%)	0(0%)	-40.0%
Grade III	9(45%)	1(5%)	0(0%)	-45.0%
Group B				
Absent	0(0%)	1(5%)	7(35%)	35.0%
Grade I	0(0%)	3(15%)	10(50%)	50.0%
Grade II	3(15%)	13(65%)	3(15%)	0.0%
Grade III	17(85%)	3(15%)	0(0%)	-85.0%
P value	0.030*	0.034*	0.006**	-

Sthambha (Stiffness): Following table shows the comparison of stiffness between two groups of patients during the follow-up.

Table 7: A Comparative Evaluation of Sthambha (Stiffness) between two groups

Sthamba	1 st day (n=20)	16 th day (n=20)	31 st day (n=20)	% change
Group A				
No	2(10.0%)	14(70.0%)	18(90.0%)	+80.0
Yes	18(90%)	6(30%)	2(10%)	-80.0%
Group B				
No	1(5.0%)	9(45.0%)	12(60.0%)	+55.0%
Yes	19(95%)	11(55%)	8(40%)	-55.0%
P value	0.548	0.110	0.028*	-

Spandana (twitching sensation): Following table shows the comparison of twitching sensation between two groups of patients during the follow-up.

Table 8: Comparative Evaluation of Spandana (twitching sensation) between two groups

Spandana	1 st day	16thday	31st day	% change
Group A				
No	5(25.0%)	11(55.0%)	13(65.0%)	+40.0%
Yes	15(75%)	9(45%)	7(35%)	-40.0%
Group B				
No	1(5.0%)	9(45.0%)	13(65.0%)	+60.0%
Yes	19(95%)	11(55%)	7(35%)	-60.0%
P value	0.077+	0.527	1.000	-

Table 9: Comparative Evaluation of SLR between two groups

SLR	1 st day	16thday	31st day	% change
Group A				
Grade 0	0(0%)	9(45%)	17(85%)	85.0%
Grade I	1(5%)	4(20%)	3(15%)	10.0%
Grade II	4(20%)	7(35%)	0(0%)	-20.0%
Grade III	15(75%)	0(0%)	0(0%)	-75.0%
Group B				
Grade 0	0(0%)	9(45%)	17(85%)	85.0%
Grade I	1(5%)	4(20%)	3(15%)	10.0%
Grade II	4(20%)	7(35%)	0(0%)	-20.0%
Grade III	15(75%)	0(0%)	0(0%)	-75.0%
P Value	1.000	1.000	1.000	-

Table 10: Comparative Evaluation of Bragard's between two groups

Bragard's	1 st day	16thday	31st day	% change
Group A				
No	0	11(55.0%)	15(75.0%)	+75.0%
Yes	20(100%)	9(45%)	5(25%)	-75.0%
Group B				
No	0	7(35.0%)	8(40.0%)	+40.0%
Yes	20(100%)	13(65%)	12(60%)	-40.0%
P value	1.000	0.204	0.025*	-

Table 11: Comparison of statistical analysis of Ruk between two groups (Mean ±SD)

Ruk	Group A	Group B	P value
1 st day	3.25±0.64	3.25±0.64	1.000
16thday	1.80±0.77	1.85±0.67	0.828
31st day	0.40±0.50	0.85±0.75	0.031*

Analysis of Ruk shows that mean value on 1st day 3.25±0.64, on 16thday mean value 1.80±0.77, and on 31st day mean value 0.40±0.50, with P value of 1.000 on 1st day, 0.828 on 16thday and 0.031* on 31st day.

Table 12: Comparison of statistical analysis of Toda between two groups (Mean ±SD)

Toda	Group A	Group B	P value
1 st day	2.25±1.02	3.20±0.70	0.001**
16thday	1.20±0.83	1.90±0.72	0.007**
31st day	0.20±0.41	0.80±0.70	0.002**

Analysis of Toda, shows that mean value on 1st day 3.25±0.64, 16thday with mean value 1.85±0.67 and 31st day with the mean value 0.85±0.75, with P value 0.001** on 1st day, 0.007** on 16thday and 0.002** on 31st day.

Table 13: Comparison of statistical analysis of SLR between two groups studied

SLR	Group A	Group B	P value
1 st day	3.10±0.91	3.00±0.86	0.723
16thday	0.90±0.91	0.90±0.91	1.000
31st day	0.15±0.37	0.15±0.37	1.000

Table 14: Comparison of Overall response between two groups

Overall response	Group A		Group B	
	No	%	No	%
Mild	5	25.0	12	60.0
Moderate	5	25.0	7	35.0
Marked response	10	50.0	1	5.0
Total	20	100.0	20	100.0

Marked response is significantly more associated with Group A with P=0.004**

Overall response: In Group A out of 20 patients after the completion of treatment 10(50%) were markedly improved, 5(25%) moderately improved, and 5(25%) were reported mild improvement. None of the patients was found unchanged.

In Group B out of 20 patients after the completion of treatment 1 (5%) were markedly improved, 7 (35%) reported moderate improvement, and 12 (60%) mild improvement.

Marked response is significantly more associated with Group A with $P=0.004^{**}$

DISCUSSION

Disease *Gridhrasi* is a *Shoolapradhana Vatavyadhi* which is classified under 80 *Vataja Nanatmaja* as well as *Samanayaja Vatavikaras*.

It is characterized by particular pain involving the structure starting from lumbosacral region radiating along the posterior aspect of buttock, thigh, knee, calf and foot. The anatomical distribution of Sciatic nerve and its involvement in the condition *Sciatica* resembles the description of *Gridhrasi* as a *Vyadhi* and *Gridhrasinadi/Dhamani* as a structure.

Looking into the description of *Gridhrasi* according to *Sushruta* and *Vagbhata*, the inability of the patient to lift the affected limb *Sakthikshepanigraha* resembles the Positive Straight Leg Raising test (SLR), once again supports the resemblance of *Sciatica* and *Gridhrasi*.

The set of *Nidanas* mentioned for general *Vatavyadhis* can be understood in particular to *Gridhrasi* and are compared with etiological factors for *Sciatica* such as *Swaprakopakanidanas* (*Aharaja* and *Viharaja*) result in *Dhatukshaya*, in turn leads to *Vataprakopa*. Avitaminosis, nutritional deficiencies including calcium deficiency was observed to lead inflammation of Sciatic nerve resulting into *Sciatica* by modern Scientists. *Dhatukshayajanya Gridhrasi* is interpreted as a degenerative condition as seen in lumbar spondylosis in which there will be marked degeneration of the vertebrae. It is commonly seen in postmenopausal women, in old age and those who are accustomed to sedentary lifestyle and strenuous work. Defective posture at work, excessive physical works etc are considered as precipitating factors of *Sciatica*.

Concept of *Gridhrasi* can also be understood in 2 ways *Margavarodha* and *Dhatukshayajanya Gridhrasi*. In cases of *Margavarodhajanya Gridhrasi* where *Vata* is being *Avrutha* and *Kapha* and *Pitta* being *Avarakas*, *Siravyadha* being *Tridoshahara*, predominantly *Pittahara* and thereby removes *Margavarodha*. *Agnikarma* a well known mode of therapy in acute painful conditions can be adopted in *Dhatukshayajanya Gridhrasi* where *Vata* is the only *Dosha* involved. Hence these two treatment modalities are being explained in the context of *Gridhrasi*.

DISCUSSION ON PROCEDURES

GROUP A – AGNIKARMA

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 Susrutha* as *Athugrarujee*.

The site of *Agnikarma* adopted was- 5 most tender points along the course of Sciatic nerve of affected leg. Why *Agnikarma* along the course of Sciatic nerve:

Doshavishesha- that is, as *Gridhrasi* is of 2 types, *Vataja* and *Vatakaphaja*, and *Agnikarma* is beneficial as *Vata* and *Kaphahara*.

Sthanavishesha- as the symptoms of *Gridhrasi* states *Spikhpoorvakatipristaurujanujanghapadamkramat*, the disease is seen in entire leg, *Agnikarma* along the course of sciatic nerve was planned for the study.

Vyadhivishesha- in *Chikitsa* of *Gridhrasi* *Agnikarma* has been said. And also there is a reference that if any treatment modality fails ultimately *Agnikarma* helps.

Picchilaannapana was advised prior to *Agnikarma* as this helps to increase *Snighdata* in the body as *Agnikarma* is *Rookshachikitsa*. Procedure was explained to the patient and consent was taken. The most tender points were marked so as to pin point the pain as pointed by the patient, with the Red Hot *Shalakra Samyak Dagdhavrana* was created over the marked points. Mixture of *Madhu* and *Grutha* was applied over the *Dagdhavrana* as quoted by *Sushrutacharya*. The procedure followed in this clinical work is the standard one, accepted generally because of its proximity to the idea of *Agnikarma* in the *Samhitas* and results obtained were constantly encouraging. Hence this method was adopted.

GROUP B – SIRAVYADHA

The main aim of the *Raktamokshana* is *Prakupita Doshanirharana*. *Siravyadha* is indicated primarily in generalized vitiation of blood causing distress. In contemporary science venipuncture or phlebotomy treatment is parallel to *Raktamokshana*.

The Site of *Siravyadha* adopted was - '*Antarakandaragulpha*' of affected leg. Why *Siravyadha* at *Antarakandaragulpha*- this can be understood as,

Doshavishesha- that is, as *Gridhrasi* comes under *Vatavyadhi* and *Adhahshaaka* is *Vatasthana* as per our *Samhithas*.

Sthanavishesha- as the symptoms of *Gridhrasi* states "*Spikhpoorvakatipristaurujanujanghapadamkramat*" the disease is confined to the entire leg.

Vyadhivishesha- in *Chikitsa* of *Gridhrasi*, *Siravyadha* is *Adhya Upakrama* as per *Charaka* and the site mentioned is *Antarakandaragulpha Pradesha*.

As *Sushruta* says *Samyak Siravyadha laxanas Samyagatwayada Raktamswayammevaavatistati, Shuddamtadavijaaneyatsamyagvisravitam* for this to happen again there is a direct reference to introduce the needle in such a way that it should be *Ruju*, *Asankeerna*, *Sukshmam*, *Ssamam*, *Anavaghadam*, *Anuttanam*, *Aashu*, *Sandhi-marma-sira* should be kept

in mind while doing *Siravyadha* so that they should not be damaged.

The *Sira* which can be considered for *Antarakandaragulpha* is probably Posterior Tibial vein and this was selected because of the following reasons-

- Due to maximum gravitational force in that area.
- As this vein is near to capillary bed the peripheral resistance will be increased.
- In ankle joint, range of venous blood pressure is between 100-20 mm of Hg, because of this when the muscle contracts, pressure goes up to 100 mm of Hg and when it relaxes, it drastically comes down up to 20 mm of Hg. So this phenomenon may cause free flow of blood as at the time of prick there will be muscle contractions and after sometimes when it relaxes pressure drastically comes down to 20 mm of Hg which helps in cessation of blood by itself and this is why *Samyakvisravyalaxanas* were seen at this point.

Snehana & *Swedana* prior to *Siravyadha* is necessary prerequisite. *Snehana* in terms of *Abhyanga* induces *Utkleshana* of *Doshas*, *Swedana* does *Vilayana* of *Doshas* and increase microcirculation. *Tilayavagupaana* before *Snehana* and *Swedana* decreases viscosity of Blood. In the form of *Yavagu* it directly enters into *Rasa-Rakta Srotas* and enhances *Utkleshana* of *Raktadoshas* (*Kleda/Amlata*) necessary for *Dooshita Raktanirharana* by *Siravyadha* method.

Initially Scalp vein Set Number 23 was executed for *Siravyadhana*. It was found that the blood let out was about 15 to 20 ml which was insufficient quantity. The pressure with which blood let out was very less and did not match with classical reference. Early clotting of blood was observed.

Hence 18 Number gauze needle was introduced. Following observations were made.

- Blood oozed out like a jet as described in classics thus fulfilling Pressure criteria.
- Blood let out was about 150- 160 ml, sufficient quantity for *Doshanirharana*.
- Clotting of blood was delayed.
- Relief of symptoms was better.

This was the practical nearest approach to the *Shaastra*, hence this was followed.

PROBABLE EFFECT OF TREATMENT ON PARAMETERS

Subjective parameters

Ruk (Continues Pain)

Highly significant change in continuous pain was observed on 31st day in both the groups clinically and statistically. Group A showed better results than Group B. This may be because in *Gridhrasi*, *Ruk* (Pain) is due to *Sheetaguna* of *Vata*. *Agni Karma* by its *Vata Shamaka* property rearranged the vitiated *Vata* by its *Rooksha Guna* and in this way *Ruk* was subsided.

Toda (intermittent pain)

There were highly significant changes observed in intermittent pain in both the Groups on 31st day with P value 0.002** of the treatment. However group A shows better result after the treatment and on follow up as compared to group B. *Toda* is an advanced stage of Pain and it is mainly due to *Chalaguna* of *Vata*. Hence, after subsiding of vitiated *Vata*, *Toda* also was subsided after *Agni Karma*.

Stambha (Stiffness)

There was significant decrease in stiffness which was observed on 31st day in both the Groups for within group assessment, by comparing these two, Group A showed better results than Group B on follow up with the P value 0.028*. Here *Stambha* is attributed to *Sheetaguna* of *Vata*. *Agni Karma* by virtue of its *Ushnaguna* mitigates *Sheetaguna* and thus relived the *Stambha*.

Spandana (Twitching sensation)

There was highly significant decrease in muscular twitching on 31st day in both the Groups for within group assessment, by comparing these two Group A showed significant result (P<0.05) than Group B.

Spandana is also the result of *Chalaguna* of *Vata*. Hence, after subsiding *Vata*, *Spandana* also subsided after *Agni Karma*.

SLR test and Bragard's test

There was highly significant change observed in SLR test in both the Groups on 31st day (p<0.001), But Group A showed better change than Group B after completion of the treatment. Again SLR test can be correlated with symptom given by *Sushruta* "*Sakthanahkshepamnigraharniyata*". It occurs due to masking of *Vata* by *Kapha*. *Agni Karma* by virtue of its *Ushna*. *Tikshna* and *Sukshmaguna* breaks those *Avarana* thereby restoring the normal *Gati* of *Vata*. Hence, proper movement of Limb occurs.

By looking into above results, it can be concluded that Group A (*Agnikarma* Group) and Group B (*Siravyadha* Group) showed highly significant result in the symptoms of the patients though the individual statistical analysis of majority of the parameters showed significant improvement in both the groups.

Overall assessment of both Groups

Agnikarma treatment adopted in Group A was both Statistically & Clinically more significant in relieving symptoms like *Ruk*, *Toda*, *Sthamba* and *Spandana*.

Siravyadha treatment adopted in Group B was clinically more significant in relieving *Ruk*, *Toda* but not *Sthamba* and *Spandana*.

Overall response is significantly more in Group A (Marked response 50%) when compared to Group B (5%) with P= 0.004**

Probable mode of action of Agnikarma and Siravyadha

It is very difficult to interpret the exact mode of action of *Agnikarma* or *Siravyadha*, but in this study both these modalities were selected as *Laakshanaka Chikitsa*. In *Gridhrasi Siravyadha*, *Basti*, *Agnikarma* are the treatment modalities explained. Here if we look in to these modalities *Agnikarma* and *Siravyadha* are the treatment modalities as *Laakshanaka Chikitsa*, whereas *Basti* as *Vyadhihara Chikitsa*. Hence this study aimed at comparing two *Laakshaika Chikitsa* modalities.

Mode of action of Agnikarma

- In *Gridhrasi*, there will be *Vatavridhi* and sometimes *Kaphavridhi* and in turn there will be increase in *Sheeta Guna*, which causes stiffness. When *Agnikarma* is done, it increases *Ushnata* and subside *Sheetaguna* and thus may help in relieving signs and symptoms of *Gridhrasi*.
- When direct heat is transferred into 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* (local metabolism), by this the waste products (metabolites) which are produced gets excreted, which normalizes the blood circulation thus resulting in reduction in intensity of pain.
- It is hypothetically stated that after *Samyak Dagdha*, some local antibodies or non-specific immuno-globins may act as a disease modifying agents.
- It is also hypothetically stated that when *Agnikarma* is done it stimulates piezo electricity there by releasing electrical signals and then cause oriental deposits in lesions, this resists deformity and prevents further damage, thus may help to bring back normalcy.
- Also hypothetically it is stated that locally *Agnikarma* is capable of breaking down the vicious adhesive encapsulations and thus may relieve pain. And it also has systemic actions like when the lymph circulation increased by 6 times, a brain hormone Tryptophan is released. Albumin, amino acid, glucose ratio is increased there will be break down of histamines, thereby it might have relieved pain.
- Heat produced by the *Agnikarma*, helps to achieve muscle relaxation and relieve muscle spasm with inflammation. *Agnikarma* may stimulate the sensory receptor lying in the muscle, send message to the brain, which stimulates the pituitary gland to release endorphins which in turn binds with opiate receptors in the pain cells to block the pain stimuli. Endorphin is a naturally occurring neuro-peptide

and like morphine and other opiates it has a marked propensity for binding on the opiate receptors of the pain cell in the brain.

- It is hypothetically stated that inside the cell, Heat Shock Proteins take the peptides and hand them over to another group of molecules. These other molecules take the abnormal peptides that are found only in sick cells and move them from inside the cell to outside on the cell's surface. When the abnormal peptides are displayed in this way, they act as red flags, warning the immune system that the cell has become sick. These abnormal peptides are called *antigens* - a term that describes any substance capable of triggering an immune response.
- Raising the temperature of damaged tissue through Red Hot *Shalaka* may speed up the metabolic process, improve circulation by vasodilatation, reduce edema, accelerate repair, which can reduce painful stiffness in joints like arthritis. Thus *Agnikarma* may help in reducing the pain and stiffness of the joints.
- The pain receptors in the skin and other tissues have free nerve endings. The Red Hot *Shalaka*, which causes destruction of the free nerve endings, tend to close the -gate and prevent the sensory transmission of pain.

Effect of Agnikarma on Gridhrasi

1. Increased metabolism
2. Increased blood circulations
3. Relaxation to the muscle
4. Decreases pain perception

Mode of action of Siravyadha

- *Siravyadha* has direct action on *Raktha Dhaatu*. Here *Khandara* being an *Upadhaatu* of *Raktha Dhaatu* is afflicted by *Kupita Dosh*(s). Hence *Siravyadha* may act on the *Khandara* involved *Gridhrasi*.
- In the *Samprapti* of *Gridhrasi* the *Prakupita Vata*, *Vaata Kaphadosha* cause *Aavarana* of *Vaata* 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*, *Jaanujangha*. As there is *Rakta* and *Sira* involvement *Siravyadha* may correct the *Samprapti* by *Dosha Nirharana* and *Srotoshodhana* action.

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 *Upadhaatu* of *Mamsa Dhaatu* whose quality is in

turn dependent on *Shuddha Rakta*. So *Siravyadha* may improve the quality of *Rakta* and thereby act on *Mamsa* and *Snaayu*.

- *Gridhrasi* and other *Vatavyadhi* are to be administered with *Siravyadha* after *Vatavyadhi samanyachikitsa* for complete relief as said by *Dalhanacharya*.
- In *Sciatica* due to Sciatic nerve compression the blood supply is hampered so there is accumulation of large amount of lactic acid in nerve(s) which leads to formation of Bradykinins and Proteolytic enzyme resulting in shooting pain. By *Siravyadha* may be the blood flow to the compressed part increases by angiogenesis with enhanced local aerobic metabolism which prevents the accumulation of lactic acid in the nerve(s) by draining it out. Thus there may be reduction in the pain.
- In *Siravyadha* hormones like Serotonin are released, which are believed to cause pre synaptic and post synaptic inhibition avoiding pain. This may probably help in relieving pain.
- In *Grudrasi*, *Rakta* plays a considerable role in implementing inflammation of disc, Sciatic nerve and its connections, dermatomes and muscle compartments. And while enumerating the six *Kriyakaala* types, *Susrutha* emphasizes on the role of *Rakta*. When we analyze *Gridhrasi* w.s.r to *Sciatica* there will be friction, inflammation (*Sanga, Prakopa*), radiation of pain (*Prasara*), and *Sthanasamshraya* features like continuous dull pain, muscle weakness, pricking pain, inability to lift the limbs etc can be asserted. In this respect also target specific procedure like *Siravyada* can be applied to tackle the clinical effects of abnormality of *Rakta*.
- Physiologically, blood communicates at almost every zone of human body either directly or by indirect influences. The role and importance of *Rakta* (blood tissue) in the genesis, manifestation and progress of various clinical conditions with respect to *Gridrasi* is evident. *Siravyadha* is one such radical treatment especially concerned with *Dusta Raktanirharana* (the macroscopic removal of 'morbid blood' from unwanted contexts or situations).
- Patho-physiological studies suggest that in case of a considerable blood loss (> 100 ml), the immediate haemodilution stimulates / triggers a host of beneficial physiological mechanisms making the body alert and adaptive to take care of various systemic challenges present. Back up support in the form of immunologic, inflammatory and trigger factors intended for specific purposes is recruited in pathological tissues, for the management of the damage.
- After considerable amount of bloodletting, Psycho-Neuro-Endocrinal mechanisms mediated by Hypothalamus, Pituitary, Adrenocortic axis are triggered. Brain responds with commanding

actions through efferent signals to vessel or vascular system thereby relieving pain.

- *Shonitha Kleda* is one of the *Pittaja Nanatmaja vikara* and here *Kleda* refers to multiple intermediate metabolites, particles etc, embedded in *Raktha* hence *Raktamokshan* by *Siravyadha* is an attempt to reduce the excessive *kleda* in *Shonitha*. In case of *Grudrasi kleda* could refer to inflammatory factors involved in acute stages.
- There is reference that Renin-Angiotensin System can be activated when there is loss of blood volume or the drop in blood pressure. Juxta glomerular cells release the enzyme rennin, rennin in turn cleaves into an inactive peptide called Angiotensinogen, converting into Angiotensin I. Angiotensin I is then converted into Angiotensin II by Angiotensin converting enzyme (ACE) which is found in lung capillaries. ACE degrades inflammatory mediator Bradykinin and Substance P involved in neuropathic pain due to peripheral and central sensitization respectively. Thus having significant reduction of pain.
- In general, various probable mechanisms could lead to a change in body by bloodletting, such as local blood supply is improved, local metabolism is improved, local drainage system is improved, fresh RBCs are produced which are active. Release of hormones, sympathetic nerve function etc, are triggered which directly stimulates bone marrow, immune related T-Lymphocytes.
- It produces *Langhana, Swedana, Pittaharana, Rakthadosharana*. Hence *Siravyadha* invariably results in immediate repair when compared to other therapeutic procedures that take longer periods for the relief of symptoms and is considered as *Ardha Chikitsa* in *Shalyatantra*.

CONCLUSION

Agnikarma is effective in both acute and chronic cases and shows quick results in relieving *Ruk* (100%), *Toda* (85%), *Sthamba* (90%), *Spandana* (65%).

Siravyadha is effective in acute cases and provides gradual & effective results in relieving *Ruk* (90%), *Toda* (85%), *Sthamba* (60%), *Spandana* (65%).

Statically both the groups showed significant changes making SLR and Bragard's sign negative better in Group A. *Siravyadha* (Venepuncture) and *Agnikarma* gives relief spontaneously in the cardinal symptoms of *Gridhrasi*.

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STUDY PHOTOGRAPHS



Figure 1: Instruments used for Agnikarma

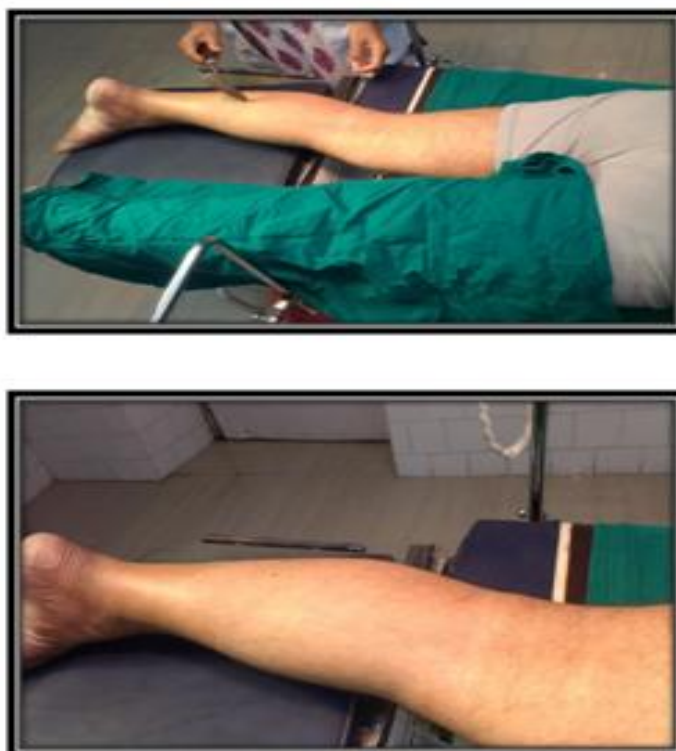


Figure 2: Procedure of Agnikarma



Figure 3: Instruments used for Siravyadha



Figure 4: Procedure Showing Siravyadha