A COMPARATIVE STUDY ON THE EFFICACY OF AGNIKARMA AND SIRAVYADHA IN THE MANAGEMENT OF GRIDHRASI (SCIATICA)

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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, 5 moderately improved, and 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.

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 (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
• Snehana
• Swedana
• Oral medication

Siravyadha is accepted as half of the therapeutic measures in Shalyatantra like Basti 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.

Siravyadha (Venepuncture) and Agnikarma gives relief spontaneously in the cardinal symptoms of Gridhrasi.

The management of Gridhrasi Agnikarma and Siravedha procedures are useful in reducing pain.

Agnikarma to Padakanistika 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 Lakshaniya Chikitsa, whereas Basti as Vyadhahara Chikitsa. Hence this study aimed at comparing two Lakshiniya 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.r.t to Sciatica.
2. To evaluate the efficacy of Siravyadha in the management of Gridhrasi w.r.t to Sciatica.
3. To evaluate the comparative efficacies of Agnikarma and Siravyadha in the management of Gridhrasi w.r.t 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 Spik, Kati, Ur, Janu, Jangha, and Pada.
- Positive SLR test.
- Positive Bragard's sign.
- Patient with Chronicity upto1year.
B) Inclusion Criteria

- Patient with features of Gridhrasi namely Ruk (continuous pain), Toda (intermittent pain), Stambha (stiffness), Spandana (twitching) over Spikh, Kati, Prishta, Uru, Janu, Jangha extending up to Pada.
- Positive SLR test.
- Positive Brgard’s sign.
- Patient with Chronicity up to 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
- Siravyadhanaarha

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 day’s 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

**Sthambha (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 Tilatala 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 Sirā at Antarakandaragulpha) was cleaned with surgical spirit. A tourniquet was tied, the part (Prominent Sirā) was performed for 1 day and to keep the area clean and dry till it heals.

**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 Gudapanā of 200ml on the day after Siravyadhā.

**Number of sittings**

First sitting was done on 1st day, after 15 days 2nd sitting of Siravyadhā was performed on 16th day. 2 sittings of Siravyadhā 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.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Samples are gender matched with P=0.337

<table>
<thead>
<tr>
<th>Chronicity</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Samples are gender matched with P=0.337
Table 3: Chronicity of patients

<table>
<thead>
<tr>
<th>Chronicity</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No %</td>
<td>No %</td>
</tr>
<tr>
<td>&lt;1 months</td>
<td>3 15.0</td>
<td>1 5.0</td>
</tr>
<tr>
<td>1-3 months</td>
<td>5 25.0</td>
<td>2 10.0</td>
</tr>
<tr>
<td>3-6 months</td>
<td>7 35.0</td>
<td>11 55.0</td>
</tr>
<tr>
<td>6-12 months</td>
<td>5 25.0</td>
<td>6 30.0</td>
</tr>
<tr>
<td>Total</td>
<td>20 100.0</td>
<td>20 100.0</td>
</tr>
</tbody>
</table>

Chronicity is statistically similar in two groups with p=0.408

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

<table>
<thead>
<tr>
<th>Ruk</th>
<th>1st day</th>
<th>16th day</th>
<th>31st day</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>0(0%)</td>
<td>1(5%)</td>
<td>12(60%)</td>
<td>60.0%</td>
</tr>
<tr>
<td>Grade I</td>
<td>0(0%)</td>
<td>5(25%)</td>
<td>8(40%)</td>
<td>40.0%</td>
</tr>
<tr>
<td>Grade II</td>
<td>9(45%)</td>
<td>11(55%)</td>
<td>0(0%)</td>
<td>-45.0%</td>
</tr>
<tr>
<td>Grade III</td>
<td>11(55%)</td>
<td>3(15%)</td>
<td>0(0%)</td>
<td>-55.0%</td>
</tr>
<tr>
<td>Group B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>0(0%)</td>
<td>1(5%)</td>
<td>6(30%)</td>
<td>30.0%</td>
</tr>
<tr>
<td>Grade I</td>
<td>0(0%)</td>
<td>3(15%)</td>
<td>12(60%)</td>
<td>60.0%</td>
</tr>
<tr>
<td>Grade II</td>
<td>9(45%)</td>
<td>14(70%)</td>
<td>1(5%)</td>
<td>-40.0%</td>
</tr>
<tr>
<td>Grade III</td>
<td>11(55%)</td>
<td>2(10%)</td>
<td>1(5%)</td>
<td>-50.0%</td>
</tr>
</tbody>
</table>

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

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

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

<table>
<thead>
<tr>
<th>Sthambha</th>
<th>1st day (n=20)</th>
<th>16th day (n=20)</th>
<th>31st day (n=20)</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2(10.0%)</td>
<td>14(70.0%)</td>
<td>18(90.0%)</td>
<td>+80.0</td>
</tr>
<tr>
<td>Yes</td>
<td>18(90.0%)</td>
<td>6(30.0%)</td>
<td>2(10%)</td>
<td>-80.0%</td>
</tr>
<tr>
<td>Group B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1(5.0%)</td>
<td>9(45.0%)</td>
<td>12(60.0%)</td>
<td>+55.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>19(95%)</td>
<td>11(55%)</td>
<td>8(40%)</td>
<td>-55.0%</td>
</tr>
<tr>
<td>P value</td>
<td>0.548</td>
<td>0.110</td>
<td>0.028*</td>
<td>-</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>1st day</th>
<th>16th day</th>
<th>31st day</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5(25.0%)</td>
<td>11(55.0%)</td>
<td>13(65.0%)</td>
<td>+40.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>15(75%)</td>
<td>9(45%)</td>
<td>7(35%)</td>
<td>-40.0%</td>
</tr>
<tr>
<td>Group B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1(5.0%)</td>
<td>9(45.0%)</td>
<td>13(65.0%)</td>
<td>+60.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>19(95%)</td>
<td>11(55%)</td>
<td>7(35%)</td>
<td>-60.0%</td>
</tr>
<tr>
<td>P value</td>
<td>0.077+</td>
<td>0.527</td>
<td>1.000</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 9: Comparative Evaluation of SLR between two groups

<table>
<thead>
<tr>
<th></th>
<th>1st day</th>
<th>16th day</th>
<th>31st day</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 0</td>
<td>0(0%)</td>
<td>9(45%)</td>
<td>17(85%)</td>
<td>85.0%</td>
</tr>
<tr>
<td>Grade I</td>
<td>1(5%)</td>
<td>4(20%)</td>
<td>3(15%)</td>
<td>10.0%</td>
</tr>
<tr>
<td>Grade II</td>
<td>4(20%)</td>
<td>7(35%)</td>
<td>0(0%)</td>
<td>-20.0%</td>
</tr>
<tr>
<td>Grade III</td>
<td>15(75%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
<td>-75.0%</td>
</tr>
<tr>
<td>P Value</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>-</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>1st day</th>
<th>16th day</th>
<th>31st day</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 0</td>
<td>0(0%)</td>
<td>9(45%)</td>
<td>17(85%)</td>
<td>85.0%</td>
</tr>
<tr>
<td>Grade I</td>
<td>1(5%)</td>
<td>4(20%)</td>
<td>3(15%)</td>
<td>10.0%</td>
</tr>
<tr>
<td>Grade II</td>
<td>4(20%)</td>
<td>7(35%)</td>
<td>0(0%)</td>
<td>-20.0%</td>
</tr>
<tr>
<td>Grade III</td>
<td>15(75%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
<td>-75.0%</td>
</tr>
<tr>
<td>P Value</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>-</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st day</td>
<td>3.25±0.64</td>
<td>3.25±0.64</td>
<td>1.000</td>
</tr>
<tr>
<td>16thday</td>
<td>1.80±0.77</td>
<td>1.85±0.67</td>
<td>0.828</td>
</tr>
<tr>
<td>31st day</td>
<td>0.40±0.50</td>
<td>0.85±0.75</td>
<td>0.031*</td>
</tr>
</tbody>
</table>

Analysis of Ruk shows that mean value on 1st day 3.25±0.64, on 16th day 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 16th day and 0.031* on 31st day.

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

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st day</td>
<td>2.25±1.02</td>
<td>3.20±0.70</td>
<td>0.001**</td>
</tr>
<tr>
<td>16thday</td>
<td>1.20±0.83</td>
<td>1.90±0.72</td>
<td>0.007**</td>
</tr>
<tr>
<td>31st day</td>
<td>0.20±0.41</td>
<td>0.80±0.70</td>
<td>0.002**</td>
</tr>
</tbody>
</table>

Analysis of Toda, shows that mean value on 1st day 2.25±1.02, 16th day with mean value 1.20±0.83 and 31st day with the mean value 0.20±0.41, 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

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st day</td>
<td>3.10±0.91</td>
<td>3.20±0.70</td>
<td>0.001**</td>
</tr>
<tr>
<td>16thday</td>
<td>1.20±0.83</td>
<td>1.90±0.72</td>
<td>0.007**</td>
</tr>
<tr>
<td>31st day</td>
<td>0.20±0.41</td>
<td>0.80±0.70</td>
<td>0.002**</td>
</tr>
</tbody>
</table>

Table 14: Comparison of Overall response between two groups

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>5(25.0%)</td>
<td>12(60.0%)</td>
<td>0.004**</td>
</tr>
<tr>
<td>Moderate</td>
<td>5(25.0%)</td>
<td>7(35.0%)</td>
<td></td>
</tr>
<tr>
<td>Marked response</td>
<td>10(50.0%)</td>
<td>1(5.0%)</td>
<td></td>
</tr>
</tbody>
</table>

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 Samanayoja 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 Sakhthikshepanigraha 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 Swaprapokakanidanas (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 spondylisis 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 Magavarodha and Dhatukshayajanya Gridhrasi. In cases of Margavarodha 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 Susruta as Athugraruje.

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 Spikhpoorvakapistraturujananyanghapadamkramat, 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 is been said. And also there is a reference that if any treatment modality fails ultimately Agnikarma helps.

Picchilaanapanama 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 Shalakha Samyak Dagdhhavrana was created over the marked points. Mixture of Madhu and Grutha was applied over the Dagdhhavrana as quoted by Susrutacharya. 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 Prakapita 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 Antarkandaragulpha- this can be understood as,

**Doshavishesha**- that is, as Gridhrasi comes under Vatavyadhi and Adhalashaka is Vatakshana as per our Samhitas.

**Sthanavishesha**- as the symptoms of Gridhrasi states “Spikhpoorvakapistraturujananyanghapadamkramat” the disease is confined to the entire leg.

**Vyadhivishesha**- in Chikitsa of Gridhrasi, Siravyadha is Adhyu Upakrama as per Charaka and the site mentioned is Antarkandargulpha Pradeshha.

As Sushruta says Samyak Siravyadha laxanas Samyakagatwayada Raktamswayamveavavatistati, Shuddamtaadvijaaneysamatayagvisvivotam for this to happen again there is a direct reference to introduce the needle in such a way that it should be Rju, Asankeerna, Sukshma, Ssamam, Anavgadhadam, 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 Gunam 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 Ushnaguna 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 “Sakthanahkshepanmigrahreniyata”. It occurs due to masking of Vata by Kapha. Agni Karma by virtue of it’s 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 Vatavriddh 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 Sheetayagna and thus may help in relieving signs and symptoms of Gridhrasi.

• When direct heat is transferred into tissue, it causes Dhatuwaitklesha and improves Dhatwagani causing Amapachana leading to Nimrata. Due to Nimrata of Vata and Kapha, Dushya samurchana vighetana takes place. Thus may bring back normalcy in affected part.

• When Agnikarma is done, it probably increases the Sthanikaaggni (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 Sanyak 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 Tryprotphan 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 Khanda being an Upadhaatuv of Raktha Dhaatu is afflicted by Kupita Dosha(s). Hence Siravyadha may act on the Khanda involved Gridhrasi.

• In the Samprapti of Gridhrasi the Prakupita Vata, Vaata Kaphadosha cause Aavarana of Vaata and Sthanaasamshraya of Dosh 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 Dosa Nirharana and Srotoshodhana action.

As Dalhana states when there is involvement of Dosa and Dhoooshya in the Disease manifestation Dhoooshya should be treated and in turn Dosa 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 sanyachikitsa 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 synoptic and post synoptic inhibition avoiding pain. This may probably help in relieving pain.

- In Gridhrasi, 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.r.t to Sciatica there will be friction, inflammation (Sanga, Prakopa), radiation of pain (Prasara), and Sthanasamshraya features like continuous dull pain, muscle weakness, prickling 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 Gridhrasi is evident. Siravyadha is one such radical treatment especially concerned with Dusta Raktnirharana (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 Gridrasi kleda could refers 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, Rakthadoshaharana. 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 Ardh 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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6. Ibid
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Cite this article as:

Source of support: Nil, Conflict of interest: None Declared
STUDY PHOTOGRAPHS

Figure 1: Instruments used for Agnikarma

Figure 2: Procedure of Agnikarma
Figure 3: Instruments used for Siravyadha

Figure 4: Procedure Showing Siravyadha