



## AN OBSERVATIONAL PROSPECTIVE STUDY FOR THE MANAGEMENT OF GRIDHRASI

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### ABSTRACT

*Gridhrasi* is one of the most common debilitating diseases of all age groups, affecting the physical, mental, and social life of patients. *Ayurveda* offers a lot of possibilities for musculoskeletal ailments, and *Gridhrasi* is not an exception. *Gridhrasi* is one among the *Vataja Nanatmaja Vyadhi* where dysfunction of *Vata dosha* manifests as low back pain which radiates to the lower limbs, accompanied by stiffness and a pricking type of pain. *Gridhrasi*'s symptoms closely resemble the clinical features of *Sciatica* in modern science where pain, weakness, numbness and other discomforts along the path of the sciatic nerve are often accompanied with low back pain. Contemporary conservative treatments offer only temporary relief, and surgical options cannot eliminate the associated complications. *Acharya Charaka* has provided three limb treatment techniques for *Gridhrasi*. This classical intervention has yet to be previously attempted, and thus, this study aims to establish the effectiveness of these treatments for *Gridhrasi*. Since *Gridhrasi* significantly impacts patients' physical, mental, and social well-being, there is a compelling need to identify a suitable and cost-effective cure, making it the focal point of this research. The three limbs are namely *Basti*, *Siravyadha* and *Agnikarma*. *Basti* is regarded as *Sodhana Chikitsa* where, whereas *Siravyadha* and *Agnikarma* are *Anusalya Chikitsa*. Thus, in this study, the classical reference of *Acharya Charaka*'s treatment principle of *Gridhrasi* was taken, and a conceptual three-arm survey including these three treatment modalities was done. The outcome of the study is expected to generate clinical evidence on the effect of three individual treatments in *Gridhrasi*.

**Keywords:** Gridhrasi, Siravyadha, Basti, Agnikarma, Sciatica.

## INTRODUCTION

In clinical practice, one of the most prevalent conditions encountered is *Gridhrasi*, which often manifests as back pain accompanied by radiculopathy. There exists a pressing need for research aimed at safer and more cost-effective, non-invasive procedures that offer improved efficacy. This chapter serves as an introductory overview of the study, commencing with a discussion on the background and importance of the research and subsequently outlining the study's goals and objectives. This is a relatively common condition with a lifetime incidence varying from 13% to 40%.<sup>1</sup> The corresponding annual incidence of an episode of Sciatica ranges from 1% to 5%. The incidence of Sciatica is related to age. It is rarely seen before the age of 20; incidence peaks in the fifth decade and declines after that. Several observational studies have suggested that processes other than pressure on nerve roots are involved in developing sciatic neuralgia.<sup>2</sup>

*Gridhrasi* is described under *Vatavyadhi* and is referred to as *Ruja Pradhana Vatavyadhi*. It was one of the eighty varieties of *Nanatmaja Vata Vikaras* listed by *Acharya Charaka*.<sup>3</sup> It is called *Gridhrasi* because the person's walk resembles a vulture's (*Gridra*).<sup>4</sup> *Gridhrasi* is the name for the disease when the exacerbated *Vata* invades the *Kandaras* of the ankle and toes, causing pain and an inability to stretch in the thighs.<sup>5</sup> The disorders are described in all of the Ayurvedic texts. The disease significantly impacts *Sphik*, *Kati*, *Prushta*, *Uru*, *Janu*, *Jangha*, and *Pada*. *Gridhrasi Vataja* and *Vata Kaphaja* are two forms of *Gridhrasi* that *Acharya* mentioned. Despite the fact that *Vata* is the main contributing element to this disease. Along with it, *Kapha Anubandha* is frequently observed. The key characteristics of the *Vataja* type of *Gridhrasi* are *Stamba*, *Ruk*, *Toda*, and *Span-danam*, whereas *Tandra*, *Gaurava*, and *Arochaka* are also present in the *Vata-Kaphaja* type of *Gridhrasi*.<sup>6</sup>

*Gridhrasi* can be correlated with Sciatica in modern medicine and is an excruciating condi-

tion. Sciatica is characterised by constant aching pain, which is felt in the lumbar region and may radiate to the buttocks, thigh, calf, and foot. Sciatic pain radiates along the course of the sciatic nerve. It is caused by impingement of the L4, L5 or S1 nerve roots and manifests as unilateral neuropathic pain extending from the gluteal region down the posterolateral aspect of the leg to the foot.<sup>7</sup> Muscle relaxants, NSAIDs, narcotics, and corticosteroids, all of which have adverse side effects and necessitate hospitalisation, are used in conventional medicine. Consequently, a multi-model, multi-disciplinary strategy is the most effective for treating sciatica. While analgesics and physiotherapy can relieve sciatica symptoms, they do not offer a definitive cure. Although costlier and with potential for recurrence, surgeries are available as an option. Ayurveda presents numerous, possibly more effective, choices for managing this painful condition. To overcome the above limitations, and Ayurvedic management implementing the basic treatment principle of *Gridhrasi*, including three different modalities mentioned by *Acharya Charaka*, is taken here.

*Sodhana Chikitsa* is one of the most important treatment modalities in Ayurveda.<sup>8</sup> *Basti*, a *Sodhana Chikitsa* regarded as a prime treatment modality among *Panchakarma*, and *Siravyadha* is one among the *Panchasodhana*. *Basti Chikitsa* is an *Ardhachikitsa* quoted by *Charakacharya* due to its multiple effects. Hereby, it's very clear how important the procedure is among all the treatment modalities of Ayurveda. Even *Acharyas* have mentioned it removes the vitiated *Dosha*, which has been spread throughout the body by quoting the word *Aapa-dathalamasthakam* while explaining the spread of *Bastidravya* in the body. *Basti* is not only best for *Vata* disorders but also equally effective in correcting the morbid *Pitta*, *Kapha* and *Rakta*. It's a unique procedure explained for the management of *Vata Vyadhi*, where *Gridhrasi* is the predominant of *Vata*

*Dosha, Basti* is being used widely for the management of *Gridhrasi*.

*Siravyadha* is one of the most commonly used procedures in Indian classical surgery. The *Susrutha* school used this approach both therapeutically and prophylactically. According to *Acharya Susrutha*, half, i.e., *Ardhachikitsa* or the complete *Salyatantra*, is equivalent to *Siravyadha* alone; thus, this approach has the potential to cure a variety of diseases. He further stated that *Siravyadha* can treat diseases not alleviated by *Sneha-Swedaadi*. *Siravyadha* is an emergency management system that helps achieve better results. With the advancement of modern techniques, we can perform the procedure in more straightforward ways, using scalp vein sets or blood transfusion sets. *Acharya Susruta* mentioned *Agnikarma* under *Anusastra*, which is more efficacious than other therapeutic procedures as it gives instant relief in pain. *Acharya* also states that *Agnikarma* is a definitive eradication treatment, and when administered, there is no possibility of disease recurrence in treated cases.

Many studies have been undertaken about the efficacy of *Anusastrakarmas* and *Panchakarmas* in the management of *Gridhrasi*. The Ayurvedic management, incorporating the fundamental treatment principles of *Gridhrasi*, including three different modalities mentioned by *Acharya Charaka*, has yet to be previously explored in managing *Vataja* disorders associated with *Gridhrasi*. These outlined facts have prompted the current study, which aims to assess the effect of *Basti*, *Siravyadha*, and *Agnikarma* in managing pain associated with *Gridhrasi*. The current study endeavours to determine the effect of *Basti*, *Siravyadha*, and *Agnikarma*, the three treatment modalities described by *Acharya Charaka* for *Gridhrasi* management. Following inclusion criteria, this observational study was carried out in 63 patients suffering from *Sciatica* undergoing *Basti*, *Agnikarma*, and *Siravyadha*. The subjects with satisfying selection criteria were observed under three groups. The Assessment criteria were analysed statistically, and conclusions were drawn. This three-arm observation-

al study assessed the effect of *Basti*, *Siravyadha* and *Agnikarma* in *Gridhrasi*.

#### OBJECTIVES

- To observe the effect of *Basti* in the management of *Gridhrasi*.
- To observe the impact of *Siravyadha* in the management of *Gridhrasi*.
- To observe the effect of *Agnikarma* in the management of *Gridhrasi*.

#### AIM OF THE STUDY

- To evaluate the effect of *Basti*, *Siravyadha* and *Agnikarma* in the management of *Gridhrasi*.

#### MATERIALS AND METHODS

A study was done on patients attending OPD and IPD of Sree Narayana Institute of Studies and Research Hospital, Puthur, Kollam-691507. Participants who satisfied the inclusion and exclusion criteria as advised by the physician for either *Basti*, *Siravyadha* or *Agnikarma* were selected and included in the study. A purposive sampling technique was used, and the inclusion of participants was stopped till each group reached 21 participants. For baseline data collection, a structured case proforma was used, and it was consistently employed to assess any potential effects post-treatment and during the follow-up periods of 15, 30, and 45 days.

#### SELECTION CRITERIA:

##### INCLUSION CRITERIA:

1. Participants of either gender in the age group of 20 to 60 years.
2. Participants diagnosed with signs and symptoms of *Gridhrasi*.

##### EXCLUSION CRITERIA

1. *Gridhrasi* developed due to any traumatic, infective, neoplastic, congenital disease and post-surgical complications.
2. Pregnant and lactating women.
3. Participants with bleeding disorders and surgical intervention.
4. Participants contraindicated for *Basti*, *Siravyadha* and *Agnikarma*.

#### PROCEDURE:

Participants under the age group of 20-60 years, irrespective of sex, diagnosed as *Gridhrasi* treated in the

OPD and IPD of Sree Narayana Institute of Ayurvedic Studies and Research, Puthur, Kollam-691507 fulfilling the inclusion and exclusion criteria were selected. After getting consent from unit chiefs, the treatments and their outcomes were observed and recorded. After the observation period, the participants were categorised into three groups based on the treatment received, i.e., *Basti*, *Siravyadha* and *Agnikarma*. The effect of these treatment modalities, Basti, Siravyadha, and Agnikarma, was evaluated on a pre-post basis, and their outcomes were statistically analysed.

#### Assessment and follow-up:

The participants were clinically observed before any medical or para-surgical intervention in OPD and IPD of Sree Narayana Institute of Ayurvedic Studies and Research, Puthur, Kollam-691507. Assessment was done before treatment and after treatment of the specific treatment modalities, which can be either Basti, Siravyadha, or Agnikarma, based on subjective

and objective parameters. The participants were followed up for 45 days, and clinical assessment was done on day 15, day 30, and day 45 after treatment.

#### PROCEDURE IN GROUP A: BASTI

*Anuvasana Basti* and *Niruha Basti* were given as per the *Yoga Basti* schedule. Two *Anuvasana Bastis* were given on the first two days, and then on the succeeding days, *Niruha Basti* and *Anuvasana Basti* were done alternatively. On the last day, one *Anuvasana Basti* was given. So, in group A, the eight Bastis were completed in eight days.

#### PROCEDURE IN GROUP B: SIRAVYADHA

Under Aseptic precautions, a prominent vein near *Antara-Kandara-Gulpha* was given a prick with a sterile no. 18 gauge scalp vein set and fixed. The blood let out was collected in a kidney tray and measured with a measuring jar. *Siravyadha* continued until the bleeding stopped by itself or till *Samyak Siravyadha Lakshanas* appeared.



#### PROCEDURE IN GROUP C: AGNIKARMA

The *Panchaloha Salaka* was heated to red hot over the flame of the gas stove. The Staff Nurse was advised to hold the affected limb in a suitable position.

Later, Agnikarma was performed with Red Hot *Salaka* in *Binduakriti* at a marked point (*Antara-kandara-Gulpha*) in such a way that *Samyakdagdha Lakshanas* were observed.



**CRITERIA FOR ASSESSMENT**

**Subjective parameters:**

- Ruk (Pain)
- Toda (Prickling pain)
- Sthamba (Stiffness)
- Spandana (Twitching)
- Aruchi (Anorexia)
- Tandra (Torpor)
- Gourava (Heaviness)

**Objective parameters:**

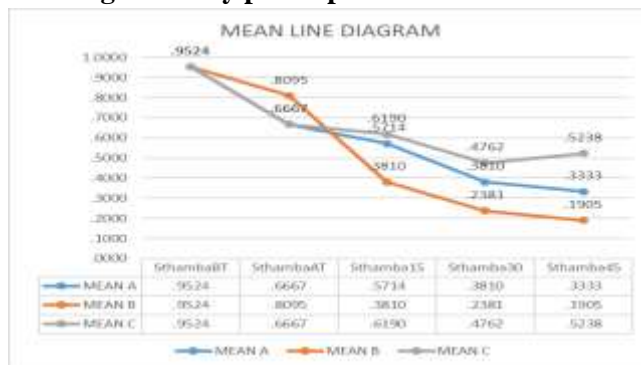
SLR test.

**RESULTS AND ANALYSIS**

The collected data were subjected to statistical analysis using appropriate statistical techniques. Frequency and percentages were calculated for qualitative variables, while mean and SD were calculated for quantitative variables. Since the data is not normally distributed, non-parametric methods were employed to analyse it. The Wilcoxon signed-rank test was

used to assess significant effects before and after treatment within each group. A p-value less than 0.05 is considered to be statistically significant. This study includes both *Vataja* and *Vata kapha* types of *Gridhrasi*. Based on the observations recorded during the survey, *Gridhrasi* is more commonly found in 50-60 years, 57.1% and 40-49 years, 33.3%. Most participants included in the study were females, about 71.4% in Group A, 81% in Group B and 66.7% in Group C, who reported exerting during household chores. The majority of the participants were observed from the Hindu community, with 61.9% in Group A, 76.2% in Group B and 61.9% in Group C and belonging to the middle class. It was observed that the maximum, i.e., 38.10%, Housewives, 14.29% are office workers, business and students and wage workers, 9.52 % and 4.72% are others. The Business/ Shop keepers, Housewives and office workers and students were more affected.

**I. Assessment of Sthamba among the study participants**



Mean line diagram of *Sthamba* in Group A, B, C

When the mean value of *Sthamba* before treatment and after the 45<sup>th</sup> day of follow-up after treatment was considered, comparatively, *Sthamba* was found to be more relieved among the study participants of Group B (from 0.952 to 0.190). Among the other two groups, Group A had a better result than Group C. Therefore, *Siravyadha* has been found more effective in pacifying *Sthamba* in *Gridhrasi*.

**II. Assessment of *Ruk* (pain) among study participants**



**Mean line diagram of *Ruk* (pain) in Group A, B, C**

Here in Graph groups A & B, who administered *Basti* and *Siravyadha* had got sudden relief during treatment and follow-up. In contrast, in group C, a gradual and uniform reduction in pain has been seen. Overall, the graph shows that *Siravyadha* was more effective in reducing *Ruk* in the long run as it has given somewhat better figures.

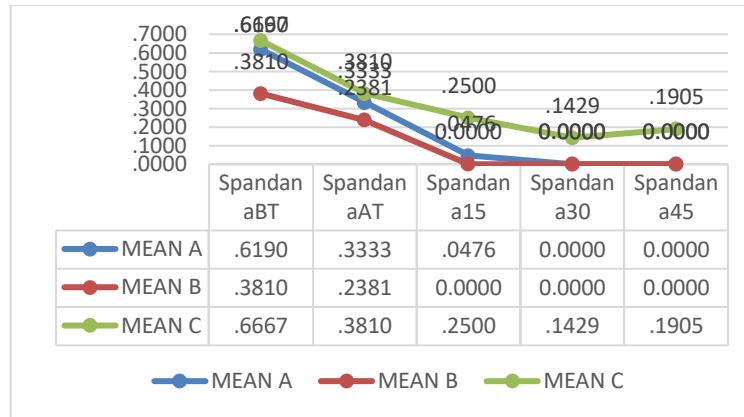
**III. Assessment of *Toda* (throbbing pain) among study participants**



**Mean line diagram of *Toda* (throbbing pain) in Group A, B, C**

In Graph, group A, who administered *Basti*, was found to experience a steep reduction in *Toda* compared to other groups. But in the long run, *Siravyadha* has been found more effective among the three treatments as Group B experienced more reduced *Toda* on the 45th day of follow-up.

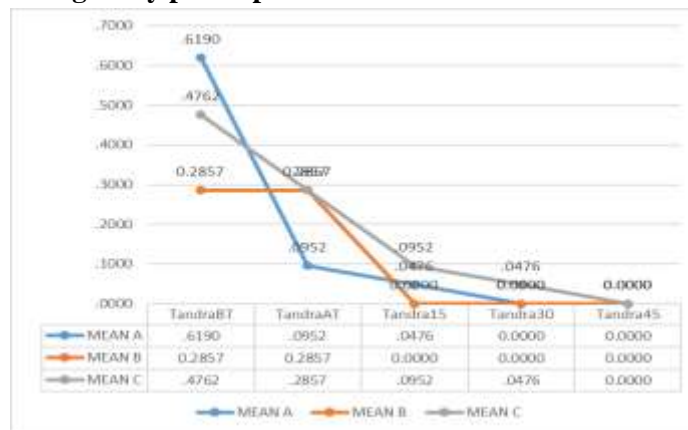
**IV. Assessment of *Spandana* among study participants**



Mean line diagram of Spandana in Group A, B, C

All treatments except *Agnikarma* brought complete Spandana relief after treatment and during the follow-up period. In the case of group C, the trend shows a steep reduction in condition compared to before, but it was not able to completely relieve it.

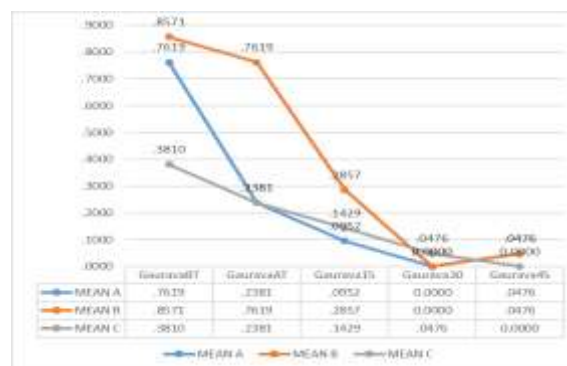
V. Assessment of Tandra among study participants



Mean line diagram of Tandra in Group A, B, C

All treatments enabled the participants to attain complete relief. As per the trend shown in the graph, *Basti* was found to have brought a sudden change to the preceding condition of Tandra among the group A participants.

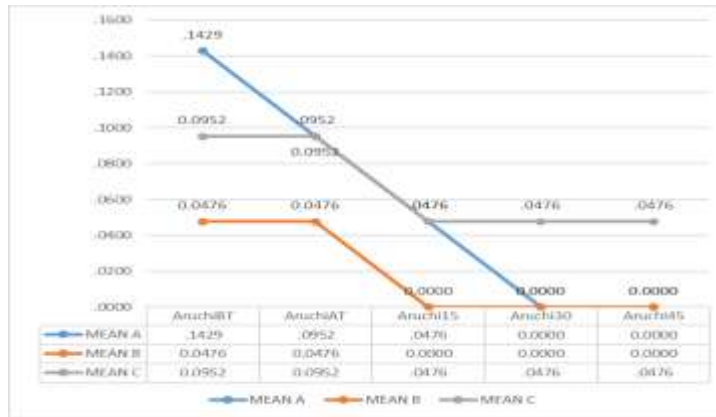
VI. Assessment of Gourava among study participants



Mean line diagram of Gourava in Group A, B, C

The graph shows that in the three groups, *Gourava* was found to be almost pacified. In the case of groups A and B, i.e., those who administered Basti and Agnikarma, the condition was found to reappear after being completely relieved. In groups A and B, a steep reduction in condition was observed, while in group C, where *Agnikarma* was given, such a trend was not seen. But it finally ended in complete relief.

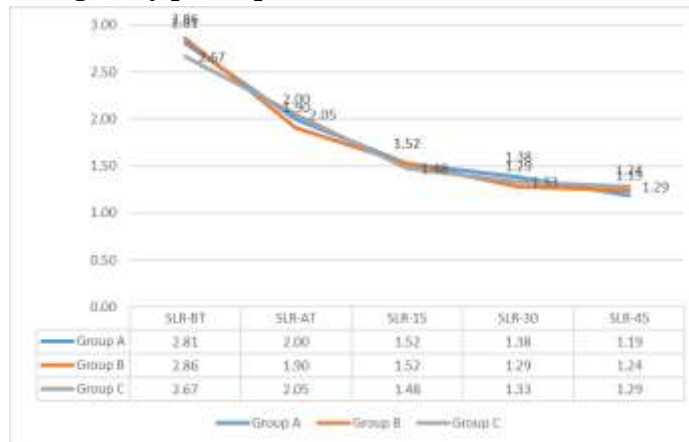
**VII. Assessment of Aruchi among study participants**



**Mean line diagram of Aruchi in Group A, B, C**

Here in Graph, group A, who administered Basti, experienced a steep decrease in *Aruchi* BT to complete relief. In contrast, in group B, the condition got pacified entirely, where the participants were administered *Siravyadha*. However, in the case of group C, a completely pacified condition was not observed, even though it was reduced.

**VIII. Assessment of SLR among study participants**



**Mean line diagram of SLR in Group A, B, C**

As per the Graph, all three groups have experienced a reduction in the mean value of SLR. But more differences found in the long run towards the 45<sup>th</sup> day of follow-up were among those who administered *Basti* as their treatment, while the other two groups got somewhat similar results.

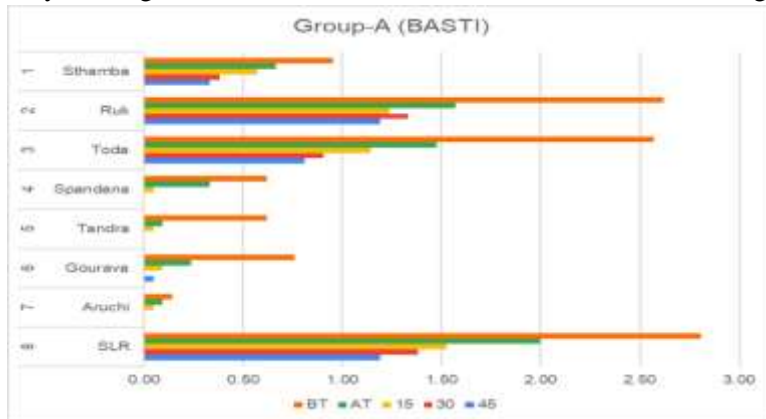
**The effect of Basti assessment**

In Group A, *Sthamba* showed a statistically significant reduction during the treatment and follow-up with maximum effect in that period. *Ruk* also showed a statistically significant reduction but noted a mild increase in symptoms during the 15<sup>th</sup> to 30<sup>th</sup> day. *Toda* showed considerable reduction with continuous reduction initially followed by gradual reduction during follow-up of treatment. *Spandana* showed highly significant reduction with same rate of decline in the symptoms in the treatment and the follow up period.



*Tandra* showed a sharp reduction during the treatment period followed by a slow reduction. *Gourava* showed a significant reduction with a continuous decline in symptoms during both the treatment and follow-up phases. This reduction was followed by a gradual decrease, eventually leading to a mild eleva-

tion of symptoms. *Aruchi* showed highly significant reduction with a consistent rate of decline in the symptoms during both the treatment and follow-up periods. SLR showed statistically significant reduction during both the treatment and follow-up phases, with maximum effect during the follow up period.

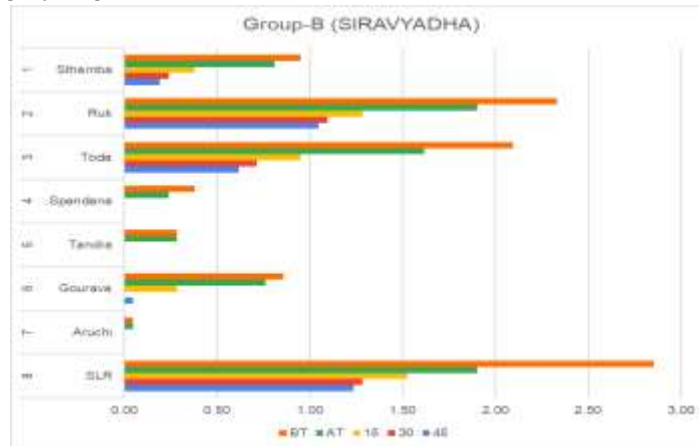


Mean diagram of Basti

**The effect of Siravyadha assessment**

In Group B, *Sthamba* showed statistically significant reduction during the treatment and follow up, characterized by a gradual decrease in symptoms within that time frame. *Ruk* also showed statistically significant reduction during the treatment and follow up periods, with maximum effect observed during that period. *Toda* showed significant reduction during the treatment period. However, there was a continuous reduction in symptoms observed initially during the follow-up phase, which was then followed by a gradual reduction during the subsequent follow-up period. *Spandana* showed highly significant reduction

with the maximum rate of decline in the symptoms observed during both the treatment and follow-up periods. *Tandra* showed no reduction during the treatment period, followed by a maximum reduction during the follow up period. *Gourava* showed significant reduction, with a sharp decline of symptoms during the treatment and follow up periods. However, there was a mild elevation of symptoms during the last period of follow up. *Aruchi* showed no reduction during the treatment period but displayed a maximum reduction during the follow up period. SLR showed a statistically significant reduction during both the treatment and follow-up periods, with the maximum effect observed in that period.

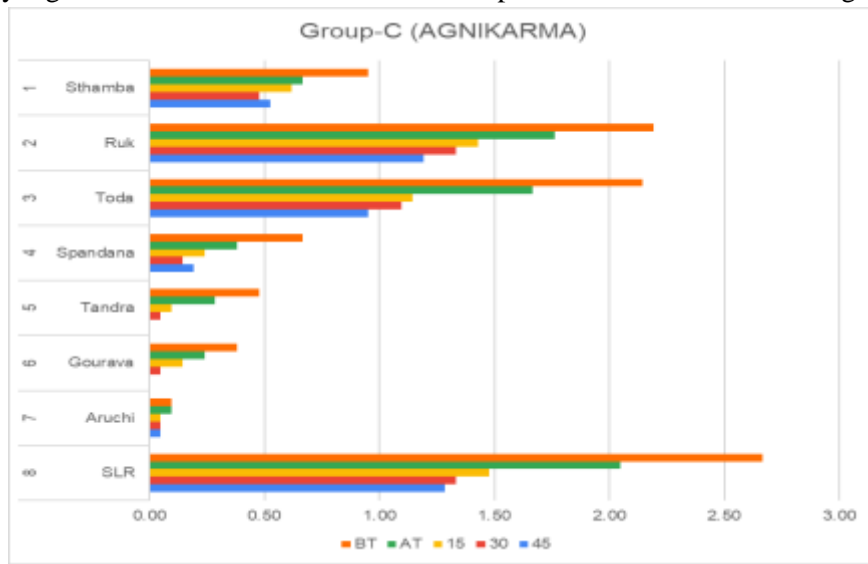


Mean diagram of Siravyadha

**The effect of Agnikarma assessment:**

In Group C, the *Sthamba* showed statistically significant reduction during both the treatment and follow-up periods, marked by a slow reduction and concluding with a moderate increase in symptoms during the final phase of follow-up. *Ruk* also showed statistically significant reduction during the treatment and follow up periods, with maximum effect during that period. *Toda* showed significant reduction with consistent rate of reduction initially, followed by gradual reduction during follow up phase of treatment. *Spandana* showed highly significant reduction with maximum

rate of decline in the symptoms during both the treatment and follow-up periods. However, this reduction ended in a moderate increase in symptoms during the final phase of follow-up. *Tandra* showed a significant reduction during the treatment period, followed by a maximum reduction. *Gourava* showed significant reduction with a slow decline of symptoms during both the treatment and follow-up periods. *Aruchi* showed no reduction during the treatment period, followed by a maximum reduction during the follow up period. SLR showed statistically significant reduction during the treatment and follow up with maximum effect during that period.



Mean diagram of Agnikarama

**DISCUSSION**

*Gridhrasi* is a *Ruja Pradhana vatavyadhi* that belongs to the 80 types of *Vataja Nanatmaja Vikaras*. It affects the *Adhakaya* of *Shareera* and impairs one's locomotor activity. *Gridhrasi* is a *Vata* predominant condition most commonly associated with *Kapha Dosha*. The disease is characterised by onset of symptoms such as *Ruk*, *Toda*, *Stambha*, *Spandana*, initially in the *Sphik*, and then spared progressively downwards to *Kati*, *Prushta*, *Janu*, *jangha* till *Pada*. The elevation of the thigh will also be restricted in the patient suffering from *Gridhrasi*. When discussing the clinical features, the site of onset of disease is the *Sphik*, subsequently extending towards the *Kati*, *Prushta*, *Uru*, *Janu*, *Jangha*, and *Pada*, can be corre-

lated with the occurrence of one-sided neuropathic pain that travels down from the buttocks to the rear part of the lower limb. The symptoms "*Ruk*" and "*Toda*" described in *Gridhrasi* is akin to the sensation of aching, sharp shooting, and tingling pain experienced in cases of *Sciatica*. The concept of "*Sakthikshepanigraha*" in *Gridhrasi* aligns with the constrained straight leg raise test employed in diagnosing *Sciatica*, which serves as its diagnostic technique.

**Basti**

**Probable mode of action**

*Basti* is the superior *Sodhana* procedure for *Vata*. According to *Acharya Charaka*, *Basti* is regarded as *Ardha Chikitsa* or *Sampurna Chikitsa* among all therapeutic measures because of its multidimensional action. *Basti* is invariably useful in diseases caused

by *Vata*, *Pitta*, *Kapha*, *Rakta*, *Samsarga* & *Sannipataja doshas*. *Basti Dravya* stays at *Pakvasaya* and starts its action from there. According to *Acharya Susruta* and *Charaka*, the *Basti* that is given in the *Pakvasaya*, by its *Veerya*, draws vitiated doshas placed in the entire body, right from the foot to the head, much as the sun in the sky absorbs all the moisture from the earth. The natural abode of *Vayu* is considered *Pakvasaya*. The two kinds of abnormalities of *Vata* namely, *Avarana* and *Dhatu Kshaya* can be treated by *Basti karma*. Direct administration of this kind of treatment to *Pakvasaya* helps not only in regulating and co-ordinating *Vata* in its site but also controls the other *Doshas* involved in the pathogenesis of diseases. In the *Samprapti* of *Gridhrasi*, *Vata* along with *Kapha Dushti* plays a major role and as *Yoga Basti* is indicated for such a condition it is selected for this study. *Basti* eliminates *Malasanghata* and maintains *Anuloma Gati* of *Apana Vayu*. *Vata* is vitiated by *Gunas* such as *Rooksha*, *Laghu*, *Seetha* etc. *Rookshata* of *Vata* is destroyed by *Snigdha guna* of *Basti*, *Laguthwa* by *Guru Guna*, and *Seethatva* by *Ushna Guna* (here *Sneha Dravya* in *Kashaya Vasti* and *Sneha Vasti* will help in removing *Rookshata* of *Vata*). Particularly, *Doshas* located at *Kati*, *Prushta* and *Koshta*, where *Sihana Samsraya* of *Gridhrasi* takes place are scrapped off and directed outside. It cleanses the channels and eliminates *Doshas* and *Malas* from the body *ie. Srotosodhana*. *Ushna Teekshna* and *Rooksha Gunas* of *Basti* bring *Amapachana*, *Kapha Visoshana*, and *Srotovisodhana*. *Basti dravyas* act on *Asthivaha Srotas* and pacify *Vata* with the help of their *Madhura*, *Thikta Rasa*, and *Ushna Veerya*. *Vasti Dravya* comes in contact with *Grahani* where *Pithadhara Kala* is located. Thus, they directly act on *Majjadhara Kala*, nourishing *Majja Dhatu*. *Sneha Dravya* given at *Guda* which is regarded as the *Moola* of body reaches the whole body and nourishes all *Dhatu*s up to *Sukra* hence preventing *Dhatukshaya*. *Sneha Basti* will also provide strength to *Kati*, *Prushta* and *Pada*. It also corrects *Agnimandhya* and prevents the *Ama* formation. *Madhu* added in *Basti* by its *Lekhana Karma* scrapes out *Doshas* that produce *Upalepatva*

in the *Srotases*. *Saindhava* with its *Sookshma Guna* carries the drug to minute channels and eliminates *Avarodha*, and the *Kalka in Basti* helps in *Dosha Srava*. *Basti* is also seen to act upon the main *Lakshana* of the disease, *i.e.*, pain which is caused by *Vata*. It also has an effect on other symptoms, as it is specifically indicated in patients having *Sthamba*, *Toda*, *Vatakrita Soola* etc. Therefore, *Basti* acts on the *Dosha*, *Dushya* and *Srotases* involved in *Gridhrasi*. The *Basti* can be given as *Yogabasti* pattern. Two *Anuvasana Bastis* on the first two days, followed by alternating days of *Niruha Basti* and *Anuvasana Basti*. On the last day, one *Anuvasana Basti* can be given.

### **Agnikarma**

#### **Probable mode of action**

Among parasurgical procedures *Agnikarma* has unique quality in which therapeutically heat applied locally with the help of various *Dahanopakarana* such as *Shalaka*, *Sneha*, *Madhu* etc which produce the effect. *Acharya Sushruta* considered the *Agnikarma* as superior treatment modality than *Ksharakarma*. *Agnikarma* is always used as an ultimate measure. In *Salyatantra* this therapy is famous as “*Daha Paramaeshyathe*” stopping the *Raktashrava*. The uniqueness of *Agnikarma* is because of its attributes such as *Apunarbhava* of *Roga*, *Nirjantukarma* (sterilisation), *Rakthasthambana* property (Haemostatic action), *Kapha – Vataghna* properties etc. *Agnikarma* is indicated in *Vataja* diseases and in *Atyagra Ruje*.<sup>9</sup> It pacifies the *Vata* by its *Ushna* and *Ruksha Guna*, thus helping in controlling the pain and other symptoms of *Gridhrasi*. According to *Acharya Charaka* this procedure is performed at *Antharakandaragulpha*. *Stambha* and *Ruk*, the predominant symptoms of *Gridhrasi* which disturbs the normal routine of the patient are effectively relieved by the *Agnikarma*. In *Gridhrasi*, the *Sheeta Guna* of *Vata* and *Kapha*, causes stiffness. *Agnikarma* helps in removing the *Avarana* due to its *Ushna Guna* which pacify the *Sheeta Guna*. Thus, helps in the reduction of *Sthamba*. *Spandana* is also the result of *Chalaguna* of *Vata*. Hence, after subsiding *Vata*, *Spandana* also gets subsided by *Agni Karma*.

*Gaurava*, a condition associated with a sense of heaviness, primarily results from the *Guru Guna*, which is predominantly found in *Kapha Dosha*. Since *Agni* possesses *Laghu Guna* and its *Ushna Guna* counteracts the cold quality of *Kapha*, *Agnikarma* can alleviate *Gaurava*. *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. The SLR test can be correlated to the symptom described by *Susruta* as "*Sakthanahkshepamnigraharniyata*," which is caused by the masking of *Vata* by *Kapha*. *Agni Karma*, with its *Ushna*, *Tikshna*, and *Sukshmaguna* qualities, removes this *Avarana*, restoring the natural movement of *Vata* and allowing for proper limb mobility. Increasing tissue temperature using a Red-Hot *Salaka* can potentially enhance metabolism, improve circulation via vasodilation, reduce swelling, and speed up the healing process. The site '*Antara Kandara Gulpha*,' located between the Achilles tendon and the medial malleolus, is used in *Agnikarma*. This is because, when considering the course of the sciatic nerve, the tibial nerve, which is one of its branches, terminates in the medial aspect of the foot. Additionally, L4, one of the dermatomes innervated by the sciatic nerve, is responsible for sensation in the medial malleolus. Paraesthesia occurs in the medial aspect of the calf and ankle. Therefore, applying heat over these dermatomes can help reduce pain through the gate control mechanism. Also Hypothetically, Heat Shock Proteins within cells transfer abnormal peptides to other molecules. These molecules then transport these unique peptides, found only in diseased cells, from inside the cell to its surface. When displayed on the cell's surface, these abnormal peptides act as signals, alerting the immune system to the cell's illness. These unusual peptides are known as antigens, which are substances capable of triggering an immune response. Pain receptors in the skin and other tissues have free nerve endings. The application of the Red-Hot *Salaka*, which destroys these free nerve endings, may effectively close the "gate" and block the sensory transmission of pain.<sup>10</sup> Local therapeutic heat relieves pain

and painful muscle spasms by inducing an inflammatory condition in the area, increasing blood circulation and decreasing the metabolic waste that causes localized pain. *Agnikarma*, when performed, likely elevates the local metabolism (*Sthanikaagni*), facilitating the elimination of waste products (metabolites). This normalization of blood circulation subsequently leads to a decrease in pain intensity. Additionally, it is hypothetically suggested that *Agnikarma* stimulates piezoelectricity, releasing electrical signals that promote the deposition of oriental materials within lesions. This process resists deformities and prevents further damage, potentially aiding in the restoration of normalcy.<sup>10</sup>

### **Siravyadha**

#### **Probable mode of action**

*Raktamokshana* is a procedure that has only been practiced since the *Vedic* period. *Raktha* helps in nourishing all *Dhatus* and maintaining the complexion of the body. *Raktamokshana* is of two types: *Shastra Visravana* and *Anushastra Visravana* again classified into *Prachana* and *Siravyadha*. *Siravyadha* is considered as half of the therapeutic measures in *Shalyatantra* like *Basti* in *Kayachikitsa*. In the case of *Gridhrasi*, it has immediate effects, effectively alleviating its cardinal symptoms, including pain (*Ruk*), stiffness (*Sthambha*), pricking sensation (*Toda*), and tingling sensation (*Muhuspandanam*). *Dalhana*, in his commentary on *Siravyadha* in *Gridhrasi*, emphasized its effectiveness specifically in *Avrita vatajanya Gridhrasi*. When diseases are not rapidly relieved by *Snehana*, *Lepanadi* treatments, *Siravyadha* becomes an emergency management option to achieve better results. *Siravyadha* is primarily recommended in cases of disorders related to *Pitta*, *Rakta*, and *Kapha*, or when there is an association of *Pitta* or *Kapha* with *Vata Dosha*. In situations where there is an aggravation of *Vata Dosha* due to the obstruction caused by *Kapha* and *Pitta*, *Siravyadha* helps in removing the obstruction of *Pitta* and *Kapha Dosha*. This, in turn, allows for the smooth flow of the vitiated *Vata*, indirectly addressing *Vata*-related symptoms along with those caused by *Kapha Dosha*. *Siravyadha* helps in

the removal of *Avarana* produced by *Pitta-Kapha Dosha*. Thus, helps in reduction of *Sthamba*. *Siravyadha* also acts in removing the congested blood in the area of *Shonita Avrita Vata*. *Ruk* is the predominant symptom in *Gridhrasi* because of the *Sheeta Guna* of *Vata* and *Toda* is an advanced state of pain caused mainly by the *Chala Guna* of *Vata*. *Siravyadha* could have acted as *Srothoshodhaka*, thus eliminating *Avarana* and pacifying the *Vata*. *Span-dana* is caused by the *Chala Guna* of *Vata Dosha*. *Siravyadha* is primarily indicated in *Sarva Sandhi-Sharira Shula*, *Gatra Sphurana*, and *Sphutana*. The Site of *Siravyadha* adopted was 'Antarakandara-gulpha' of affected leg as per *Acharya Charaka* in *Chikitsa* of *Gridhrasi*. This can be understood because *Gridhrasi* comes under *Vatavyadhi*, and *Adhahshaaka* represents the *Vatasthana* according to our *Samhitas*. The *Sira* which can be considered for *Antarakandaragulpha* is probably Posterior Tibial vein and this was selected based on the reason that there is maximum gravitational force in that area. This vein is situated near to capillary bed, leading to an increase in peripheral resistance. 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 sharply drops to 20 mm of Hg. This phenomenon may lead to 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 natural cessation of blood flow, and this is why *Samyak Visravaya Lakhana*s were observed at this point. Prior to *Siravyadha*, it is essential to have *Snehana* and *Swedana* as prerequisites. *Snehana*, through *Abhyanga*, facilitates the loosening of *Doshas*, while *Swedana* aids in their dissolution and enhances microcirculation. Preceding *Snehana* and *Swedana*, *Tilayavagupaana* reduces blood viscosity. When administered as *Yavagu*, it directly enters the *Rasa-Rakta Srotas*, promoting the loosening of *Raktadoshas (Kleda/Amlata)*, which is necessary for the removal of vitiated blood through the *Siravyadha*.<sup>10</sup> In the pathophysiology of *Sciatica* persistent nerve

irritation/compression. causes the release of vasodilatory neuropeptides, which function as a counter-regulatory force to the vasoconstrictive nature of the sympathetic system. As a result, blood capillaries will dilate continuously, resulting in plasma extravasation into the extracellular compartment. This will result in symptoms such as *Sthamba*, *Gourava*, *Toda*, etc. *Siravyadha* helps in the removal of extracellular fluid and inflammation in the form of blood, reducing pressure on the surrounding nerves and alleviating symptoms. In cases of *Sciatica* caused by compression of the Sciatic nerve, reduced blood supply can lead to the buildup of a significant amount of lactic acid within the nerve. This, in turn, triggers the formation of *Bradykinins* and *Proteolytic enzymes*, ultimately resulting in sharp shooting pain. Through the *Siravyadha* method, it is possible that blood flow to the compressed area increases due to angiogenesis. This heightened local aerobic metabolism might help prevent the accumulation of lactic acid within the nerves by facilitating its drainage. As a result, this approach could potentially lead to a reduction in pain.<sup>10</sup>

## DISCUSSION ON OBSERVATIONS AND RESULT

### Discussion on *Sthamba* (Stiffness)

Comparatively *Sthamba* has been found more relieved among the study participants of Group B. Among the other two groups, Group A had good results than Group C. Therefore, *Siravyadha* has been found more effective in pacifying *Sthamba* in *Gridhrasi*. *Sthamba* is one among *Vata Prakopa Lakhana*s, so it is a *Vata Dosha* predominant condition. The three treatment modalities help in removing *Avarana*, possess *Vatakapha Shamana Karma* and having *Ushna Veerya*. Thus, effective in reducing *Sthamba*.

### Discussion on *Ruk* (Pain)

Also observed that groups A & B, who administered *Basti* and *Siravyadha* had got a sudden relief during treatment and follow-up, while in group C, a gradual as well as uniform reduction in pain has been seen. As a whole, it is noted that *Siravyadha* was more effective in reducing *Ruk*. *Ruk* is one among *Vata*

*Prakopa Lakshanas*, so it is a *Vata Dosha* predominant condition. *Ruk* is considered as *Satatam Sulam*. The three treatment modalities possess *Vata Shamaka*, *Shula hara*, analgesic and anti-inflammatory action. Thus, they are effective in reducing *Ruk*.

#### **Discussion on Toda (Pricking Pain)**

Group A who administered *Basti* was found to experience a steep reduction in *Toda* compared to other groups. But in the long run, *Siravyadha* has been found more effective among the three treatments as more reduced *Toda* at the 45th day of follow-up was experienced by Group B. So, we can conclude that all these three procedures have an effect on *Toda*. *Toda* is one among *Vata Prakopa Lakshanas*, so it is a *Vata Dosha* predominant condition. It is considered as *Suchibhiriva /Vichinna Shulam*. The three treatment modalities possess *Vata Shamaka*, *Shula Hara*, analgesic and anti-inflammatory. Due to *Ushna Veerya Pradhanata* of drugs in *Basti* and *ushnatva* of *Agnikarma*, it acts as *Vata Shamana*. *Siravyadha* has *Srothoshodhaka* action, thus eliminating *Avarana* and pacifying the *Vata*. Thus, these all are effective in reducing *Toda*.

#### **Discussion on Spandana (Twitching)**

In group A, the *Spandana* was found a little bit pacified after treatment and it kept on improving during the follow-up period compared to the condition before and after treatment. In group B, the condition after treatment was found not significant, but it improved during the follow-up period when compared to *Spandana* before and after treatment. In group C, the condition got improved after treatment and during the follow-up period. But there is a slight increase in condition has been noted towards the 45th day of post treatment follow-up. All treatments except *Agnikarma* had brought complete *Spandana* relief after treatment and during the follow-up period. *Spandana* is one among *Vata Prakopa Lakshanas*, so it is a *Vata Dosha* predominant condition. The three treatment modalities possess *Vata Shamana* action and is having *Ushna Veerya* property. Thus, effective in reducing *Spandana*.

#### **Discussion on Tandra (Tiredness)**

The scores of *Tandra* in Group A Group B and Group C when statistically analysed, all groups have got complete relief from *Tandra* during the follow-up period. All treatments enabled the participants to attain complete relief. *Basti* was found to have brought a sudden change to the preceding condition of *Tandra* among the group A participants. So, we can conclude that all these three groups have an effect on *Tandra*. *Tandra* is *Vata Kapha Dosha* predominant condition and is one among the *Samavata Lakshana*. *Kaphaghna* and *Katu Tikta Rasa Pradhana Ahara* and *Aushada* is indicated in reducing *Tandra*. The three treatment modalities are *Vatakapha Shamana*. *Basti* have *Tikta Rasa Pradhana*, *Ushna veerya* and *Ama Pachana* action and acts as *Kapha Hara*. *Agnikarma* also has *Ushna property* acts as *Vata Shamana*. *Vata Prakopa* caused by *Kapha* and *Pitta Avarana*, *Siravedha* can help to remove the *Avarana* of *Pitta* and *Kapha Dosha*. Thus, these were effective in reducing *Tandra*.

#### **Discussion on Gourava (Heaviness)**

The scores of *Gourava* in Group A Group B and Group C when statistically analysed, similar trends have been noted in groups A and B, in which the condition got completely pacified on the 30th day of post-treatment follow-up and the condition aggravated a little bit on 45th follow-up day. While in group C. the condition got completely relieved on the 45th day of follow-up. The chronicity of the patients was more notable in Group B and Group A, which exhibited high mean levels. It is one among the *Samavata Lakshana*. *Gaurava* is the predominance of *Guru Bhava* of *Kapha Dosha*. Most of the drugs in this *Basti* possess *Ruksha Guna*, *Ushna Veerya* and *Vatakapha Nashaka* in action. The *Tikta Rasa* predominance of drugs acts as *Shleshma Upashoshana*. *Siravyadha* also acts in removing the congested blood in the area of *Shonita Avrita Vata*. *Agni* is having *Laghu Guna*, and its *Ushna Guna* pacifies the *Sheeta Guna* of *Kapha* as well. Thus, these were effective in *Gaurava Nashana*.

#### **Discussion on Aruchi (Anorexia)**

The scores of *Aruchi* in Group A Group B and Group C when statistically analysed, groups A and B re-

ported complete relief by treatment, while Group C did not report complete relief with improved mean *Aruchi* scores. In group A, who administered *Basti* experienced a steep decrease in *Aruchi* BT to complete relief. It is one among the *Samavata Lakshana's*. *Tikta Rasa* predominance of the drugs in *Bati* acts as *Arochakaghna*, *Deepana & Pachana*, thus *Ama Pachana*. The interventional drug possesses *Aruchi Nashaka*, Stomachic, carminative, digestive and appetizing action. In *Agnikarama* the transferred *Agni* was once again used to perform the *Utkleshana* of *Dhatvagni*, which helps in the neutralization of the *Sama - Nirama Doshas*.

### Discussion on SLR

The scores of SLR in Group A Group B and Group C showed an improvement trend when compared to conditions before and after treatment and subsequent days of follow-up. Three treatment groups reported similar levels of SLR after post-treatment follow-up as well. So, we can conclude that all these three groups have effect on SLR. It is a feature in *Gridhrasi* that clearly expresses the involvement of *Vyana Vata*. The three treatment modalities have *Vata Shamana* and *Vata Anulomana action*. The straight leg raising is restricted due to the nerve root inflammation and pain occurs in the pathway of sciatic nerve. There three treatments serve as both anti-inflammatory and analgesic in action, thus improving the range of motion of lower limb.

### Overall effect of the study

All eight parameters had significant improvement individually for *Basti*, *Siravyadha* and *Agnikarma*. Rate of response differed for individual symptoms. On comparing the observation of effects of individual groups, the result obtained were, *Basti* demonstrates a high rate of reduction in all symptoms, maintaining a nearly stable condition with maximum alleviation. Participants allocated to the *Basti* group exhibited all symptoms at a severe level and achieved maximum reduction, which had a long-lasting effect. *Sthamba*, *Ruk*, *Toda*, *Spandana*, *Aruchi*, and *Tandra* experienced highly significant reduction through the implementation of the *Basti* treatment. While the *Siravyadha* treatment did not provide immediate relief,

there was a gradual and consistent reduction in symptoms such as *Ruk*, *Toda*, *Sthamba*, *Spandana*, *Tandra* and *Aruchi* during the follow-up period. The practice of *Siravyadha* significantly contributed to the reduction of these symptoms. *Agnikarma* has provided immediate relief for certain symptoms such as *Ruk*, *Toda* and *Tandra* and *Gourava*. All three treatments show a reduction in SLR, but the most significant reduction is observed in the *Basti* treatment. *Agnikarma* is an effective treatment for addressing acute pain in *Gridhrasi*, whereas managing chronic *Gridhrasi* often involves the use of *Basti*. The selection of the appropriate treatment modality depends on the chronicity and severity of the condition. As per the treatment principle of *Gridhrasi* outlined by *Acharya Charaka*, each of these therapeutic approaches has its own impact on the symptoms. This study demonstrated a significant reduction in the severity of specific symptoms that are mentioned in *Gridhrasi*. Therefore, these treatment modalities can be adopted as a protocol for managing *Gridhrasi*.

### CONCLUSION

After analysing the data collected through the clinical study the following conclusions can be drawn.

This study includes both *Vataja* and *Vata kapha* types of *Gridhrasi*. On the basis of the observations recorded during the study, *Gridhrasi* is more commonly found in the age group of 50-60 years and 40-49 years. Most of the participants included in the study were females, who reported their exertion during household chores. Majority of the patients were observed from Hindu community and belongs to middle class. Each of the three treatments, namely *Basti*, *Siravyadha*, and *Agnikarma*, showed significant individual improvements across all eight parameters. The rate of response, however, varied for different symptoms. However, some symptoms did recur during the follow-up period. *Basti* group, who initially experienced severe symptoms, achieved significant and long-lasting relief in *Sthamba*, *Ruk*, *Toda*, *Spandana*, *Tandra* and *Aruchi*. *Siravyadha* treatment did not provide immediate relief but led to a gradual and consistent reduction in symptoms like

*Ruk, Toda, Sthamba, Spandana, Tandra and Aruchi* during the follow-up period. *Agnikarma* offered immediate relief for certain symptoms such as *Ruk, Toda, Tandra and Gourava*. In this study, treatment decisions were determined based on the disease's severity, with noticeable findings indicating that patients undergoing *Basti* treatment tended to have more severe subjective and objective parameters. This suggests that those receiving *Basti* treatment likely suffered from a chronic *Gridhrasi* condition. *Basti* is considered as *Ardha Chikitsa* among *Sodhana* procedures, as it exerts a comprehensive systemic influence. This therapeutic method effectively balances all *Doshas* by *Koshta Sodhana*, resulting in long-lasting effects. Similarly, *Siravyadha* is also considered *Ardha Chikitsa*, primarily targeting *Rakthadhishtitha Doshas*. It particularly addresses inflammatory factors by eliminating impurities in the blood. Moreover, it provides a *Sakhasritha* effect compared to the *Koshtasritha* effect, which may carry a potential risk of recurrence. *Agnikarma* proves to be highly efficient in managing acute pain. Its *Ushnatwa* property allows it to dissolve blockages, thus alleviating *Vatadi Dosh*a and enhancing *Dhathwagni*. This helps alleviate *Gridhrasi* symptoms by stimulating local nerves through dermatomes, leading to improved blood circulation and reduced inflammation. In conclusion, following the *Gridhrasi* treatment principles outlined by *Acharya Charaka*, each of these therapeutic approaches exerts its unique impact on the symptoms. This study demonstrated a notable decrease in the severity of specific *Gridhrasi* symptoms, suggesting that these treatment methods can be adopted as a standardized protocol for managing *Gridhrasi*.

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