World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org
SJIF Impact Factor: 7.409

A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFICACY OF VIDDHAGNI KARMA AND AGNIKARMA WITH PANCHADHATU SHALAKA IN KATIGRAHA W.S.R. TO LUMBAR SPONDYLOSIS

Nirmala Bidari*[1] and Srinivas Masalekar[2]

[1]Post Graduate Scholar, Department of Shalyatantra, Government Ayurveda Medical College Bangalore.
[2]Professor and HOD, Department of Shalyatantra, Government Ayurveda Medical College Bangalore.

***Corresponding Author: Nirmala Bidari**
Post Graduate Scholar, Department of Shalyatantra, Government Ayurveda Medical College Bangalore.

Article Received on 13/12/2024 **Article Revised on 03/01/2025** **Article Accepted on 23/01/2025**

ABSTRACT
Lumbar spondylosis, a degenerative condition affecting the lumbar spine, is characterized by severe lower back pain, stiffness, and numbness, often impairing daily activities.[1]In Ayurveda, it corresponds to *Katigraha*, a *Vataja Nanatmaja Vyadhi*,[2] and is typically managed with therapies targeting *Vatavyadhi*. For severe cases involving pain due to vitiated *asthi* (bones) and *mamsa* (muscles), *Agnikarma* (therapeutic cauterization) is recommended.[3] This study evaluates the efficacy of *Viddhagnikarma*, a fusion of needling (*Vyadhana*) and heat application (*Agnikarma*), compared to the standard *Panchadhatu Shalaka Agnikarma*. A total of 40 patients with *Katigraha* were selected from Government Ayurveda Medical College, Bengaluru, and randomly divided into two groups of 20 each. Group A underwent *Viddhagnikarma*, while Group B received *Panchadhatu Shalaka Agnikarma*. The outcomes were assessed based on predefined criteria. Results indicated no statistically significant difference between the two groups (chi-square value: 1.32; p-value: 0.723). However, clinical observations revealed that Group B showed relatively better responses (good and moderate outcomes) than Group A. Both treatments were effective in managing *Katigraha*, with *Viddhagnikarma* providing comparable results to the established *Panchadhatu Shalaka Agnikarma*. This study supports the use of *Viddhagnikarma* as a viable alternative treatment for *Katigraha*, offering benefits such as improved circulation, reduced stiffness, and minimized invasiveness without leaving scars. The findings validate its efficacy in outpatient settings while emphasizing the need for further research to refine its applications.

KEYWORDS: Katigraha, Lumbar Spondylosis, Viddhagnikarma, Panchadhatu Shalaka Agnikarma.

INTRODUCTION
This modified approach addresses both superficial and deep-seated pain, effectively relieving symptoms of *Katigraha*. By improving patient comfort and outcomes, *Viddhagnikarma.* In Ayurveda, *Katigraha* refers to pain and stiffness in the lower back and is classified as a *Vatavyadhi* affecting the lumbar region.[4] Although not life-threatening, it significantly hampers daily activities. The lumbar region, being a primary seat of *Vata dosha*, is susceptible to *Vata prakopa* (aggravation) caused by factors like improper diet, excessive physical activity, injury, or degenerative changes.[5] According to *Ashraya-Ashrayi Bhava*, degenerative changes in the lumbar spine (*asthidhatu*) result in *Vata* imbalance, manifesting as low back pain, stiffness, and sometimes numbness in the lower limbs.[6]

In modern medicine, *Katigraha* aligns with lumbar spondylosis, a degenerative condition involving the lumbar vertebrae and intervertebral discs.[7] Factors like poor posture, chronic strain, or prior injuries lead to changes such as disc space reduction, osteophyte formation, and nerve root compression, causing severe pain, stiffness, and functional impairment. Lumbar spondylosis affects nearly 80% of industrial workers and 60% of the general population, with one in 20 people experiencing symptoms. While NSAIDs and steroids are commonly used for pain relief, these provide only temporary benefits and pose risks like gastric irritation, hyperacidity, and liver or kidney impairment with prolonged use.

In Ayurveda, several effective and safe treatment modalities are described for pain management in *Vatavyadhi*, including *Agnikarma* (therapeutic cauterization), *Siravedha*, *Basti*, *Snehana*, and *Swedana*.[8] *Agnikarma*, recommended by *Sushrutacharya* for severe pain, involves the application

of heat to the most tender areas using instruments like *Panchadhatu Shalaka* (metal rods). It alleviates pain through its *Ushna* (heat), *Tikshna* (quick action), and *Sookshma* (subtle) properties, which enhance circulation, relieve muscle tension, and remove *Srotorodha* (obstruction).[9] Despite its efficacy, traditional *Agnikarma* has limitations, such as patient fear of the red-hot rod and inconsistent temperature maintenance.

Viddhagnikarma is a modern modification that combines needling (*Viddhakarma*) and heat application (*Agnikarma*). Hypodermic needles are inserted at tender points, followed by heat transfer using a monopolar cautery probe. This method integrates the principles of acupuncture and *Agnikarma*. Needling stimulates deep muscle fibers, while heat application induces relaxation, reducing pain and stiffness. The technique stimulates both Aδ and C nerve fibers, blocking pain through mechanisms like endorphin release.[10] Unlike traditional *Agnikarma*, *Viddhagnikarma* leaves no scar marks, making it cosmetically favorable and patient-friendly emerges as a promising alternative to traditional methods in managing lumbar spondylosis.

AIMS AND OBJECTIVES OF STUDY

1) To Evaluate the efficacy of viddhagnikarma in the management of katigraha w.s.r to Lumbar spondylosis.
2) To Evaluate the efficacy of Agnikarma with panchadhatu shalaka in the management of katigraha w.s.r to Lumbar spondylosis.
3) To compare the result obtained in both the groups.

HYPOTHESIS

NULL HYPOTHESIS

- There is no significant effect of Viddhagnikarma in management of katigraha w.s.r to Lumbar spondylosis.
- There is no significant effect of Agnikarma with panchadhatu shalaka in management of katigraha w.s.r. to Lumbar spondylosis.
- There is no significant difference between Viddhagnikarma and Agnikarma with panchadhatu shalaka in management of katigraha w.s.r. to Lumbar spondylosis.

ALTERNATE HYPOTHESIS

- There is a significant effect of Viddhagnikarma in management of katigraha w.s.r to Lumbar spondylosis.
- There is a significant effect of Agnikarma with panchadhatu shalaka in management of katigraha w.s.r. to Lumbar spondylosis.
- There is a significant difference between Viddhagnikarma and Agnikarma with panchadhatu shalaka in management of katigraha w.s.r. to Lumbar spondylosis.

METHODOLOGY

SOURCE OF DATA

A) LITERARY SOURCE

Relevant literary data was collected and documented from available Ayurveda classical texts, modern books, journals, websites for the study.

B) SAMPLE SOURCE

Subjects with the Classical features of *Katigraha* w.s.r.to Lumbar spondylosis viz., pain and stiffness in low back region, restricted movement at lumbar region, fulfilling the study criteria was randomly selected irrespective of gender and socio-economic status and educational status from OPD, IPD at SJGAUH Bangalore Hospital and from the special camps organized for the study.

C) MATERIAL/DRUG SOURCE

The procedure requires **needle no. 26 Q.S**, **spirit**, **gauze pieces**, and a **skin marker**, **cautery machine**, **panchadhatu shalaka**, and a heating source like an **electric/gas stove**, along with **goghrita** for therapeutic use.

METHOD OF COLLECTION OF DATA

A. INCLUSION CRITERIA

Subjects presenting with any of the following features of lumbar spondylosis may be considered for evaluation: **low back pain**, which is often persistent or recurrent; **stiffness of the back**, indicating reduced flexibility; and **tenderness** upon palpation in the affected area. Additional symptoms include **pain radiating down the limb to the calf region**, which may suggest nerve involvement, as well as **numbness and paraesthesia** over the lateral side of the leg or foot, indicating sensory disturbances. Furthermore, **muscle spasm** may also be observed, contributing to discomfort and restricted movement. These clinical signs collectively indicate possible degenerative changes in the lumbar spine.and Age group between 21 to 60 years were included in the study.

B. EXCLUSION CRITERIA

Subjects associated with other systemic disorders such as hyperparathyroidism, hypertension, or uncontrolled diabetes mellitus. Individuals with spinal diseases like spinal tuberculosis, vertebral fractures, spondylolisthesis, or spondylolysis were excluded. Additionally, pregnant and lactating women, as well as those with pacemakers, were not eligible for participation. Subjects contraindicated for Agnikarma, those with bleeding disorders, HIV, HBsAg positive status, and malignant conditions were excluded. Furthermore, individuals with inflammatory conditions such as ankylosing spondylitis and similar disorders were excluded.

SAMPLING TECHNIQUE

Subjects suffering from *Katigraha* and willing to undergo the trial study, presenting with the features like: low back pain which may worsen with standing, stiffness, tenderness, tingling or pins and needle

sensation that radiates down the legs, muscle spasm, was selected using method of simple random sampling.

SAMPLE SIZE

A total of 40 cases with classical features of *Katigraha*/Lumbar spondylosis was selected and they were distributed randomly into two groups namely, Group-A and Group-B of 20 subjects each. A special case proforma containing all necessary details pertaining to the study was prepared.

STUDY DESIGN

An open-label randomized controlled clinical study with two groups:

GROUP A: Vidda-Agnikarma with Monopolar Cautery

Purva Karma: Subjects were informed, advised Snigdha and Pichhila Aahara, and the treatment area was cleaned with surgical spirit. Tender points (8–10) were marked with a skin marker.

Pradhana Karma: Subjects lay prone with the neutral plate under the thighs. Marked points were pierced with a no. 26 hypodermic needle, and heat was applied via a monopolar cautery machine for 1–2 seconds. The process was repeated in three cycles with 5-minute intervals per sitting, totaling three sittings at 7-day intervals.

Paschat Karma: Needles were removed, bleeding managed, and Go-Ghrita applied. Subjects were advised not to cover or wet the area for 24 hours.

GROUP B: Agnikarma with Panchadhatu Shalaka

Purva Karma: Subjects were informed, advised Snigdha and Pichhila Aahara, and the area was cleaned with Triphala Kashaya. Tender points were marked.

Pradhana Karma: Subjects lay prone, and a red-hot Panchadhatu Shalaka was used for Bindu-type Agnikarma at marked points until Samyak Dagdha Lakshanas appeared. Go-Ghrita was applied after each sitting.

Paschat Karma: Subjects were advised to avoid covering or wetting the area for 24 hours.

Duration: Three sittings with a 7-day interval between each.

OBSERVATION FOR RECURRENCES

The study duration was set at **1 month** to observe possible recurrences in cases achieving total cure. Patients were instructed to report immediately if symptoms recurred. Recurrences were confirmed through specific examinations and documented. Suitable **Pathya** (recommended practices) and **Apathya** (restrictions) were advised during and after the treatment.
Note: In cases where the patients during the period of treatment went for, they were dropped out from the study.

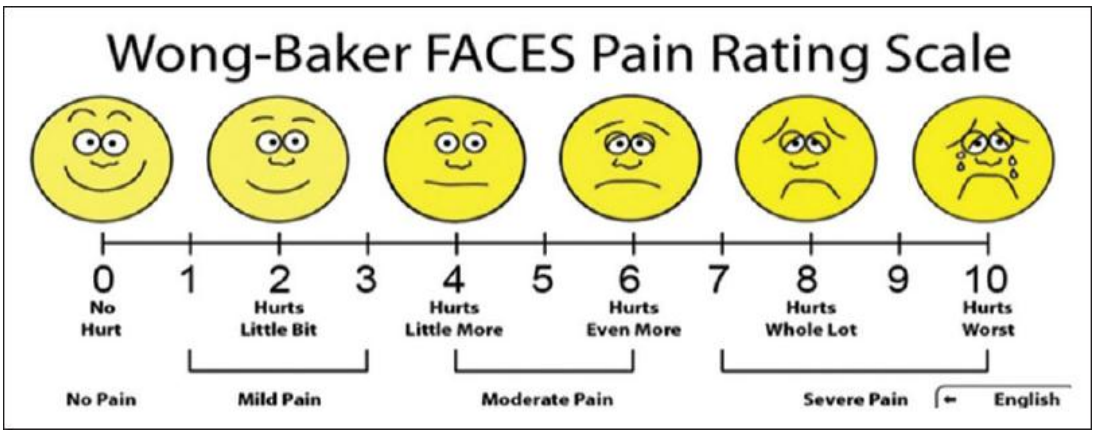
ASSESMENT CRITERIA

Assessment was made with the following parameters.

SUBJECTIVE PARAMETERS

1) PAIN

Grade (0) -VAS Score 0: No pain.
Grade (1) - VAS Score 1-3: Mild pain.
Grade (2) - VAS Score 4-6: Moderate Pain.
Grade (3)- VAS Score 7-10: Severe pain.
As per the Visual Analogue Scale



2) STIFFNESS (*KATISTHAMBA*)

Grade (0)- Absent
Grade (1)- mild (less than 15 min)
Grade (2)- moderate (15 to 30min)
Grade (3)-severe (more than 30 min)

3) RESTRICTED MOVEMENTS

Grade (0)- nothing specific
Grade (1)- mild restriction
Grade (2)- moderate restriction
Grade (3)- unable to move or bend

OBJECTIVE PARAMETERS

1) TENDERNESS

Grade (0) - Absent
Grade (1) – Mild (patient says it's paining)
Grade (2) – Moderate (patient winces)
Grade (3) - Severe (patient winces and withdraws the part)

2) COIN TEST

Grade (0)- Easily pick the coin from ground
Grade (1)- minimum difficulty to pick the coin
Grade (2)- moderate difficulty to pick the coin
Grade (3)- unable to pick the coin

3) L.S.M. (LUMBAR SPINE MOBILITY OR SCHOBER TEST)

Grade (0)- normal (5cm)
Grade (1)- mild (4 to 5cm)
Grade (2)- moderate (2 to 4cm)
Grade (3)- severe (0 to 2)
Grade (4)-unable to bend

STATISTICAL TEST

The results of both the Groups in relation to assessment parameters pertaining to Katigraha were subjected to statistical analysis by adopting various tests. To infer the clinical study the assessment parameters like Pain, Stiffness, Tenderness, coin test, Schober test were subjected to Friedman's Test to compare the Mean Rank within the groups and Mann Whitney U test to compare the Mean Rank difference values between the groups and conclusions were drawn. The corresponding p value was noted and the results obtained were interpreted.

OBSERVATION AND RESULTS

1) PAIN

Effect of treatment on Pain within Group A

Table No 1: Showing effect of treatment on Pain within Group A.

Ranks[a]	
	Mean Rank
BT	3.18
D1	3.18
D8	2.18
D15	1.48
a. Groups = Group A	

Test Statistics[a,b]	
N	20
Chi-Square	40.672
Df	3
P value	.000
a. Groups = Group A	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

CONCLUSION

This shows a significant reduction in pain levels over time. Mean rank values decreased from 3.18 at baseline (BT) and Day 1 (D1) to 2.18 at Day 8 (D8) and 1.48 at Day 15 (D15), indicating consistent improvement. A Chi-Square value of 40.672 and a p-value of 0.000 confirm significant differences in pain levels across time points, demonstrating the treatment's effectiveness.

Table No 2: showing Effect of treatment on Pain within Group B.

Ranks[a]	
	Mean Rank
BT	3.10
D1	3.10
D8	2.00
D15	1.80
a. Groups = Group B	

Test Statistics[a,b]	
N	20
Chi-Square	35.040
df	3
P value	.000
a. Groups = Group B	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group B showed a significant reduction in pain over time, with mean rank values decreasing from 3.10 (BT/D1) to 2.00 (D8) and 1.80 (D15). A Chi-Square value of 35.040 and p-value of 0.000 confirm these improvements. The treatment effectively alleviated pain, enhancing patient comfort and quality of life.

Table No 3: Showing effect of treatment on Pain between Groups.

Ranks				
Groups		N	Mean Rank	Sum of Ranks
BT	Group A	20	22.00	440.00
	Group B	20	19.00	380.00
	Total	40		
D1	Group A	20	22.00	440.00
	Group B	20	19.00	380.00
	Total	40		
D8	Group A	20	22.50	450.00
	Group B	20	18.50	370.00
	Total	40		

D15	Group A	20	20.00	400.00
	Group B	20	21.00	420.00
	Total	40		

Test Statistics[a]				
	BT	**D1**	**D8**	**D15**
Mann-Whitney U	170.000	170.000	160.000	190.000
Wilcoxon W	380.000	380.000	370.000	400.000
Z	-1.233	-1.233	-1.363	-.593
P value (2-tailed)	.218	.218	.173	.553
a. Grouping Variable: Groups				
b. Not corrected for ties.				

Since p values > 0.05, the level of significance for all BT, D1, D8 & D15; there is no sufficient evidence to reject the null hypothesis.

Analysis shows no significant differences in pain reduction between Groups A and B at any time point (BT, D1, D8, D15), with p-values > 0.05 and Z-values ranging from -1.233 to -0.593 (Mann-Whitney U test). Both treatments were equally effective in managing pain levels.

2) STIFFNESS

Table No 4: Showing effect of treatment on Stiffness within Group A.

Ranks[a]	
	Mean Rank
BT	2.70
D1	2.70
D8	2.60
D15	2.00
a. Groups = Group A	

Test Statistics[a,b]	
N	20
Chi-Square	18.545
df	3
P value	.000
a. Groups = Group A	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group A showed significant reduction in stiffness over time, with mean rank values decreasing from 2.70 (BT/D1) to 2.60 (D8) and 2.00 (D15). A Chi-Square value of 18.545 and p-value of 0.000 confirm these improvements. The treatment effectively improved mobility and comfort in patients.

Table No. 5: Showing Effect of treatment on Stiffness within Group B.

Ranks[a]	
	Mean Rank
BT	2.93
D1	2.83
D8	2.35
D15	1.90
a. Groups = Group B	

Test Statistics[a,b]	
N	20
Chi-Square	22.606
df	3
P value	.000
a. Groups = Group B	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group B showed significant reduction in stiffness over time, with mean rank values decreasing from 2.93 (BT) to 1.90 (D15). A Chi-Square value of 22.606 and p-value of 0.000 confirm these improvements. The treatment effectively enhanced mobility and quality of life in patients.

Ranks				
Groups		**N**	**Mean Rank**	**Sum of Ranks**
BT	Group A	20	20.85	417.00
	Group B	20	20.15	403.00
	Total	40		
D1	Group A	20	21.30	426.00
	Group B	20	19.70	394.00
	Total	40		
D8	Group A	20	23.25	465.00
	Group B	20	17.75	355.00
	Total	40		

D15	Group A	20	22.75	455.00
	Group B	20	18.25	365.00
	Total	40		

Test Statistics[a]				
	BT	D1	D8	D15
Mann-Whitney U	193.000	184.000	145.000	155.000
Wilcoxon W	403.000	394.000	355.000	365.000
Z	-.286	-.620	-2.137	-1.409
P value (2-tailed)	.775	.535	.033	.159
a. Grouping Variable: Groups				
b. Not corrected for ties.				

Since p values > 0.05, the level of significance for all BT, D1 & D15; there is no sufficient evidence to reject the null hypothesis.

On Day 1 (D1), there was no significant difference in stiffness between Group A (mean rank 21.30) and Group B (mean rank 19.70, p = 0.535). By Day 15 (D15), Group A's mean rank was higher (22.75 vs. 18.25), but the difference remained statistically insignificant (p = 0.159). Thus, stiffness reduction was similar in both groups.

3) RESTRICTED MOVEMENT

Table No 06: Showing effect of treatment on Restricted Movements within Group A.

Ranks[a]	
	Mean Rank
BT	3.03
D1	3.03
D8	2.33
D15	1.63
a. Groups = Group A	

Test Statistics[a,b]	
N	20
Chi-Square	33.000
df	3
P value	.000
a. Groups = Group A	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group A showed significant improvement in restricted movement, with mean rank values decreasing from 3.03 (BT/D1) to 1.63 (D15). A Chi-Square value of 33.000 and p-value of 0.000 confirm these improvements. The treatment effectively enhanced mobility and functional capacity over time.

Table No 7: Showing Effect of treatment on Restricted Movement within Group B.

Ranks[a]	
	Mean Rank
BT	3.05
D1	2.85
D8	2.35
D15	1.75
a. Groups = Group B	

Test Statistics[a,b]	
N	20
Chi-Square	27.545
df	3
P value	.000
a. Groups = Group B	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group B showed significant improvement in restricted movement, with mean rank values decreasing from 3.05 (BT) to 1.75 (D15). A Chi-Square value of 27.545 and p-value of 0.000 confirm these improvements. The treatment effectively enhanced mobility and overall quality of life.

Table No 08: Showing effect of treatment on Restricted Movement between Groups.

Ranks				
Groups		**N**	**Mean Rank**	**Sum of Ranks**
BT	Group A	20	20.93	418.50
	Group B	20	20.08	401.50
	Total	40		
D1	Group A	20	21.73	434.50
	Group B	20	19.28	385.50
	Total	40		
D8	Group A	20	20.83	416.50
	Group B	20	20.18	403.50

	Total	40		
D15	Group A	20	20.50	410.00
	Group B	20	20.50	410.00
	Total	40		

Test Statistics[a]				
	BT	D1	D8	D15
Mann-Whitney U	191.500	175.500	193.500	200.000
Wilcoxon W	401.500	385.500	403.500	410.000
Z	-.278	-.769	-.208	0.000
P value (2-tailed)	.781	.442	.835	1.000
a. Grouping Variable: Groups				
b. Not corrected for ties.				

Since p values > 0.05, the level of significance for all BT, D1, D8 & D15; there is no sufficient evidence to reject the null hypothesis.

The Mann-Whitney U test showed no significant difference in restricted movement between Groups A and B on Day 1 (U = 186.5, p = 0.442) and Day 15 (U = 200.0, p = 1.000). Both groups had similar mean ranks, indicating comparable treatment effects.

4) COIN TEST

Table No 08: Showing effect of treatment on Coin Test within Group A.

Ranks[a]	
	Mean Rank
BT	2.80
D1	2.80
D8	2.50
D15	1.90
a. Groups = Group A	

Test Statistics[a,b]	
N	20
Chi-Square	21.600
df	3
P value	.000
a. Groups = Group A	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group A showed significant improvement in the Coin Test, with mean rank values decreasing from 2.80 (BT/D1) to 1.90 (D15). A Chi-Square value of 21.600 and p-value of 0.000 confirm these improvements. The treatment effectively enhanced functional capacity over time.

Table No 09: Showing Effect of treatment on Coin Test within Group B.

Ranks[a]	
	Mean Rank
BT	3.10
D1	3.00
D8	2.10
D15	1.80
a. Groups = Group B	

Test Statistics[a,b]	
N	20
Chi-Square	31.500
df	3
P value	.000
a. Groups = Group B	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group B showed significant improvement in the Coin Test, with mean rank values decreasing from 3.10 (BT) to 1.80 (D15). A Chi-Square value of 31.500 and p-value of 0.000 confirm these improvements. The treatment effectively enhanced motor skills and overall functionality.

Table No 10: Showing effect of treatment on Coin Test between Groups.

Ranks				
Groups		**N**	**Mean Rank**	**Sum of Ranks**
BT	Group A	20	19.45	389.00
	Group B	20	21.55	431.00
	Total	40		
D1	Group A	20	19.85	397.00
	Group B	20	21.15	423.00
	Total	40		
D8	Group A	20	22.03	440.50
	Group B	20	18.98	379.50

	Total	40		
D15	Group A	20	21.10	422.00
	Group B	20	19.90	398.00
	Total	40		

Test Statistics[a]				
	BT	D1	D8	D15
Mann-Whitney U	179.000	187.000	169.500	188.000
Wilcoxon W	389.000	397.000	379.500	398.000
Z	-.624	-.384	-.953	-.447
P value (2-tailed)	.533	.701	.341	.655
a. Grouping Variable: Groups				
b. Not corrected for ties.				

Since p values > 0.05, the level of significance for all BT, D1, D8 & D15; there is no sufficient evidence to reject the null hypothesis.

The Mann-Whitney U test showed no significant differences in Coin Test performance between Groups A and B at any time point (Day 1: U = 158.0, p = 0.218; Day 15: U = 188.0, p = 0.553). Both groups had similar mean ranks, indicating comparable treatment effects.

5) SCHOBER TEST

Table No 11: Showing effect of treatment on Schober Test within Group A.

Ranks[a]	
	Mean Rank
BT	2.85
D1	2.85
D8	2.35
D15	1.95
a. Groups = Group A	

Test Statistics[a,b]	
N	20
Chi-Square	21.375
df	3
P value	.000
a. Groups = Group A	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group A showed significant improvement in spinal mobility, with mean rank values decreasing from 2.85 (BT/D1) to 1.95 (D15). A Chi-Square value of 21.375 and p-value of 0.000 confirm these improvements. The treatment effectively enhanced functional movement and quality of life.

Table No 11: showing Effect of treatment on Schober test within Group B.

Ranks[a]	
	Mean Rank
BT	3.03
D1	2.83
D8	2.25
D15	1.90
a. Groups = Group B	

Test Statistics[a,b]	
N	20
Chi-Square	24.418
df	3
P value	.000
a. Groups = Group B	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group B showed significant improvement in spinal mobility, with mean rank values decreasing from 3.03 (BT) to 1.90 (D15). A Chi-Square value of 24.418 and p-value of 0.000 confirm these improvements. The treatment effectively enhanced spinal flexibility and overall quality of life.

Table No 12: Showing effect of treatment on Schober Test between Groups.

Ranks				
Groups		**N**	**Mean Rank**	**Sum of Ranks**
BT	Group A	20	20.58	411.50
	Group B	20	20.43	408.50
	Total	40		
D1	Group A	20	21.30	426.00
	Group B	20	19.70	394.00
	Total	40		
D8	Group A	20	21.65	433.00
	Group B	20	19.35	387.00

	Total	40		
D15	Group A	20	21.25	425.00
	Group B	20	19.75	395.00
	Total	40		

Test Statistics[a]				
	BT	**D1**	**D8**	**D15**
Mann-Whitney U	198.500	184.000	177.000	185.000
Wilcoxon W	408.500	394.000	387.000	395.000
Z	-.043	-.465	-.704	-.520
P value (2-tailed)	.965	.642	.481	.603
a. Grouping Variable: Groups				
b. Not corrected for ties.				

Since p values > 0.05, the level of significance for all BT, D1, D8 & D15; there is no sufficient evidence to reject the null hypothesis.

The Mann-Whitney U test showed no significant difference in spinal flexibility between Groups A and B (p-values > 0.05). Despite slightly higher mean ranks for Group A, both treatments had comparable effects on spinal flexibility.

6) TENDERNESS

Table No 13: Showing effect of treatment on Tenderness within Group A.

Ranks[a]	
	Mean Rank
BT	2.83
D1	2.83
D8	2.33
D15	2.03
a. Groups = Group A	

Test Statistics[a,b]	
N	20
Chi-Square	19.345
df	3
P value	.000
a. Groups = Group A	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group A showed significant improvement in tenderness, with mean rank values decreasing from 2.83 (BT/D1) to 2.03 (D15). A Chi-Square value of 19.345 and p-value of 0.000 confirm these improvements. The treatment effectively enhanced patient comfort and well-being.

Table No 14: showing Effect of treatment on Tenderness within Group B.

Ranks[a]	
	Mean Rank
BT	2.75
D1	2.75
D8	2.25
D15	2.25
a. Groups = Group B	

Test Statistics[a,b]	
N	20
Chi-Square	15.000
df	3
P value	.002
a. Groups = Group B	
b. Friedman Test	

Since p value < 0.05, the level of significance, there is strong evidence to reject the null hypothesis.

Group B showed significant reduction in tenderness, with mean rank values decreasing from 2.75 (BT/D1) to 2.25 (D8/D15). A Chi-Square value of 15.000 and p-value of 0.002 confirm these improvements. The treatment effectively enhanced patient comfort and quality of life.

Table No. 15: Showing effect of treatment on Tenderness between Groups.

Ranks				
Groups		**N.**	**Mean Rank**	**Sum of Ranks**
BT	Group A	20	21.50	430.00
	Group B	20	19.50	390.00
	Total	40		
D1	Group A	20	21.50	430.00
	Group B	20	19.50	390.00
	Total	40		
D8	Group A	20	21.50	430.00

	Group B	20	19.50	390.00
	Total	40		
D15	Group A	20	20.00	400.00
	Group B	20	21.00	420.00
	Total	40		

Test Statistics[a]				
	BT	D1	D8	D15
Mann-Whitney U	180.000	180.000	180.000	190.000
Wilcoxon W	390.000	390.000	390.000	400.000
Z	-.681	-.681	-1.433	-1.000
P value (2-tailed)	.496	.496	.152	.317
a. Grouping Variable: Groups				
b. Not corrected for ties.				

Since p values > 0.05, the level of significance for all BT, D1, D8 & D15; there is no sufficient evidence to reject the null hypothesis.

Conclusion: Both treatments had similar effects on tenderness, with no statistically significant differences observed between the groups.

COMPARATIVE RESULTS OF GROUP A AND GROUP B

Table No 16: Showing Comparative Results of Group A and Group B.

PARAMETERS	GROUP A (%)	GROUP B (%)
Pain	95	90
Stiffness	30	50
Restricted Movement	65	65
Coin Test	75	80
Schober Test	70	75
Tenderness	50	65

ASSESSMENT OF TOTAL EFFECT OF THE THERAPY

Table No. 17: Showing Combined Effect of The Therapy.

Overall Effect	Group A	%	Group B	%
Good Response	00	00	01	5
Moderate Response	10	50	11	55
Poor Response	07	35	06	30
No Response	03	15	02	10
Total	20	100	20	100

Here's a comparative analysis of the effects between Group A and Group B based on the combined result chart:

Clinically, Group B showed 5% better responses (good and moderate) compared to Group A, with fewer poor and no responses. Statistically, the chi-square value of 1.32 and p-value of 0.723 indicate no significant difference between the two groups in response rates.

DISCUSSION

The patients of Katigraha reported to the OPD & IPD of Shri Jayachamarajendra Ayurveda and Unani Hospital, Bangalore are taken for the study.this study was conducted between Agust 2023 to October 2024. Totally 42 patients were registered and 02 patients discontinued the treatment. Observations were recorded in the case sheet and were analysed and tabulated after completion of the study. The observational findings are discussed below:

DISCUSSION OF DEMOGRAPHIC DATA

The demographic data reveals key trends in lumbar spondylosis,

Age: The majority of patients are aged 51-60, accounting for 42.5% of cases, with a significant proportion (45%) in the 41-50 range. This aligns with the increasing incidence of lumbar spondylosis in older adults due to degenerative changes in the spine.

Occupation: Lumbar spondylosis affects both sedentary and physically demanding occupations. Housewives, software engineers, and tailors are among the most affected, reflecting the strain from household tasks and prolonged sitting.

Site of pain: In lumbar spondylosis, tenderness is primarily in the lower spine due to degeneration, causing dull to sharp pain. Referred pain may extend to the buttocks, hips, or groin. Nerve compression can lead to

radicular pain, such as sciatica, with tingling, numbness, or weakness, and severe compression may affect the feet and toes.

DISCUSSION ON RESULTS

DISCUSSION ON EFFECT OF TREATMENT ON PAIN

Pain levels significantly improved over time in both groups. At baseline and Day 1, most patients had moderate pain, but by Day 8, the majority reported mild pain. By Day 15, nearly all patients experienced mild pain, with no severe pain reported, indicating effective pain management throughout the study.

DISCUSSION ON EFFECT OF TREATMENT ON STIFFNESS

Stiffness improved significantly over time in both groups. At baseline, most patients had mild stiffness, but by Day 15, 30% of Group A and 50% of Group B reported no stiffness. Moderate stiffness decreased, with no severe stiffness reported, indicating effective treatment and improved mobility.

DISCUSSION ON EFFECT OF TREATMENT ON RESTRICTED MOVEMENT

Restricted movement improved significantly over time, with 65% of patients in both groups reporting no restrictions by Day 15. The percentage of those with mild restrictions dropped to 35%, and none had moderate or severe restrictions. This improvement indicates the effectiveness of the interventions in enhancing mobility and quality of life.

DISCUSSION ON EFFECT OF TREATMENT ON COIN TEST

Both groups showed significant improvement in the Coin Test, with more patients reaching Grade 0 (no difficulty) by Day 15. Group B, starting with more difficulty, showed greater improvement, surpassing Group A in percentage change. The treatments were effective, with no patients experiencing severe difficulty, indicating overall positive outcomes.

DISCUSSION ON EFFECT OF TREATMENT ON SCHOBER TEST

Both groups showed significant improvement in spinal mobility, with more patients achieving Grade 0 (normal mobility) by Day 15. Group B showed slightly greater improvement, but both groups benefited from the treatments. The reduction in mild and moderate restrictions highlights the effectiveness of the interventions in enhancing spinal flexibility and mobility.

DISCUSSION ON EFFECT OF TREATMENT ON TENDERNESS

Both groups showed improvement in tenderness, with Group A experiencing a significant reduction by Day 8, reaching 90% reporting mild tenderness and only 5% by Day 15. Group B showed less improvement, with 95% still reporting moderate tenderness at Day 15. These results suggest that Group A responded more favorably to the treatment, leading to enhanced patient comfort.

DISCUSSION ON OVERALL EFFECT OF TREATMENT

Both groups showed improvements across various parameters, with Group A having a slightly better response in pain relief (95% vs. 90%) and Group B showing better outcomes in stiffness, tenderness, the coin test, and the Schober test. Both groups had equal improvement in restricted movement (65%). Group B had a 5% higher rate of good and moderate responses, but statistical analysis (chi-square 1.32, p-value 0.723) indicates no significant difference in overall efficacy, suggesting comparable therapeutic effects between the groups.

DISCUSSION ON MODE OF ACTION OF AGNIKARMA[11,12]

Viddhagnikarma. It's a combination of acupuncture and Agnikarma. One possible mechanism to explain the immediate suppression of pain is - by conditioning stimulation during acupuncture technique is known as Diffuse Noxious Inhibitory Controls (DNIC), first reported by Le Bars et al. The mechanism of DNIC requires activation of thin afferent fibers (A-delta and C fibers), as these are activated by a noxious pinch, immersion into a hot-water bath, or injection of analgesic substances into muscle. Therefore, afferent DNIC input are derived from nociceptors responsive to mechanical, thermal, and chemical stimuli. These receptors are distributed in skin, muscle, and viscera throughout the entire body.

Major nociceptive pain can be categorized into two types including visceral somatic pain (which is further classified into two kinds: deep somatic and superficial pain). Both the Aδ- and C-fibers are mostly found in superficial organs, such as the skin, whereas other deep somatic structures, such as muscles and joints, are mainly supplied with C-fibers. Aδ-fibers are activated under thermal or mechanical stimuli and result in a short-lasting-pricking type of pain sensation. However, the activation of C-fibers is stimulated by thermal, mechanical or chemical stimuli, which often results in poor localization and dull pain sensation. Here in Viddhagnikarma, we are pricking the site with needles which stimulates the deep fibres and gives more effective pain relief.

Effect on Vata and Kapha Dosha- Shoola and Stabdhata are mainly caused by the vitiation of Vata and Kapha doshas and both the doshas having relatively similar properties like Sheeta, sthamba etc. These are pacified by Ushna Guna of Agnikarma. In Katigraha there is involvement of vata and also kapha avarana. After vidhagnikarma the avarana of kapha and prakupita vata dosha reduces. This leads to pain relief and reduces stiffness in Katigraha condition.

Effect of Ushna Guna of Agni- the Ushna Guna of Agnikarma acts as Vataghna and thus relieves pain. It causes Dhatwagni utklesha and helps in Amapachana and doshapachana which in turn helps the removal of Toxins from the body. It improves local circulation and nourishment of tissues and helps to reduce the pain and inflammation.

Gate control theory of pain- Hypothetically it can be assumed that Agnikarma stimulates pain and touch sensations. When these impulses reach the spinal cord through posterior nerve root, the fibre of touch sensation send collaterals to the neurons of pain pathway i.e. cells of marginal nucleus and substantia gelatinosa. The impulses of touch sensation passing through these collaterals inhibit release of glutamate and substance P from pain fibres. This closes the gate and the pain transmission is blocked.

Effect on viscosity of tissue fluid- heat increase the blood flow and lymphatic return because heat was found to reduce the viscosity of blood and lymph.

Effect on blood flow- During the Agnikarma procedure the skin is heated by using various Dahanopakaranas, at that time the blood vessels become dilated leading to increased blood flow. Heat produces a direct effect on capillaries, arterioles etc causing them to dilate.

Vasodilatation by heat is caused by several mechanisms

1. There is thought to be a direct effect on capillaries, arterioles and venules, causing them all to dilate; the nature of this mechanism is not understood.
2. Anaxonreflex triggered by stimulation of polymodal receptors is an important cause of the vasodilatation; in this mechanism only the peripheral branches of the afferent nerve fibers are involved.
3. Increased metabolism will lead to further release of carbon dioxide and lactic acid, leading to greater acidity of the heated tissues, which leads to provoke dilatation.

Effect on muscle tone- In regular clinical practice it is noted that increased muscle tone, secondary to underlying pathology can sometimes be relieved through application of heat. Heating of tissues in a therapeutic temperature (40-450C) helps to reduce the muscle spasm. Thereby improves range of movements in Katigraha patients.

Cellular effects- The application of heat on body tissue is very helpful when applied within therapeutic limits. Chemical reactions which taken place during the metabolic activity is increased by a rise of temperature (Vant Hoff's law). Metabolic rate may increase by 13% for each 10 C rise in temperature. Increasing the tissue temperature helps in increasing of enzymatic activity to a peak value. This increases metabolism and thereby reduces pain and inflammation.

Collagenous tissue changes It has been shown that collagen melts at temperatures above 50 C. At temperatures within a therapeutically applicable range (40-45 C), extensibility of collagen tissue has been shown to increase. This only occurs if the tissue is simultaneously stretched and requires temperatures near the therapeutic limit, but it is an important therapeutic effect. Therefore, it becomes evident that joint stiffness reduces by heating.

Nerve stimulation

Plainly heat and cold stimulate the sensory receptors of the skin since these sensations can be recognized. Furthermore these receptors pass information to the heat regulating centers, contributing to the control of body temperature. Afferent nerves stimulated by heat may have an analgesic effect by acting on the gate control mechanism in the same way as the mechano receptors. There is some evidence that stimulating heat receptors inhibits nociceptive impulses in rat(Kanui, 1985). This could account for the analgesic effects of local heating. There is evidence that cutaneous sensations are altered by local heating of the skin. Hyperalgesia occurs in the area of the heated region, which appears due to mechanisms in the central nervous system at the sub-cortical level. this remains only for a few minutes after the cessation of heating.

CONCLUSION

Lumbar spondylosis is a senile degenerative disorder affecting lumbar vertebrae, discs & characterized by severe low back ache, stiffness, numbness of lower limb. Sometimes pain is so severe that it affects the routine works. This condition is called as *Katigraha* in Ayurveda, which is one of the *Vataja Nanatmaja Vyadhi*. It is characterised by *shoola* and *sthamba* of *katipradesha*. Sushruta emphasized that in case of *tivraruja* due to *asthi, mamsa, tvak, sandhi, twachagata vata - Agnikarma* is the supreme line of treatment. Hence Agnikarma was selected with panchadhatu shalaka and suchi in this condition.

Viddhagnikarma combines two Ayurvedic techniques: Vyadhana (needling) and Agnikarma (heat application). It uses fine needles followed by electric cautery to treat acute and chronic pain, especially in conditions like Lumbar spondylosis (Katigraha) and frozen shoulder (Avabahuka). The treatment stimulates pain-relieving fibers, improves blood flow, reduces stiffness, and accelerates healing by balancing Vata and Kapha doshas. This minimally invasive procedure is effective, leaves no scars, and can be performed outpatient.

The comparative results between Group A and Group B across various parameters Viz., pain, stiffness, restriction of movements, coin test, Schober test, tenderness indicate that both groups experienced improvements, but the outcomes varied depending on the parameter.Group A and Group B both improved across various parameters, but the outcomes varied. Group A showed

slightly better pain relief (95% vs. 90%), while Group B performed better in stiffness (50% vs. 30%), tenderness (65% vs. 50%), and the coin test (80% vs. 75%). Both groups had equal improvement in restricted movement (65%), but Group B had a slight edge in the Schober test (75% vs. 70%). Overall, Group B demonstrated more consistent improvements, while Group A excelled slightly in pain relief.

Comparative analysis of overall effect of treatments in both the groups shows that both the groups were effective in the management of Katigraha, even though clinically Group B showed better responses (good and moderate) compared to Group A. But the chi-square value is approximately 1.32, and the p-value is approximately 0.723. This high p-value suggests that there is no statistically significant difference between Group A and Group B in terms of response rates.

Based on observation and results, following hypothesis are accepted

- "There is no significant difference between *Viddhagnikarma* and *Agnikarma* with *panchadhatu shalaka* in management of *katigraha* w.s.r. to Lumbar spondylosis."
- There is a significant effect of *Viddhagnikarma* in management of *katigraha* w.s.r to Lumbar spondylosis.
- There is a significant effect of *Agnikarma* with *panchadhatu shalaka* in management of *katigraha* w.s.r. to Lumbar spondylosis.

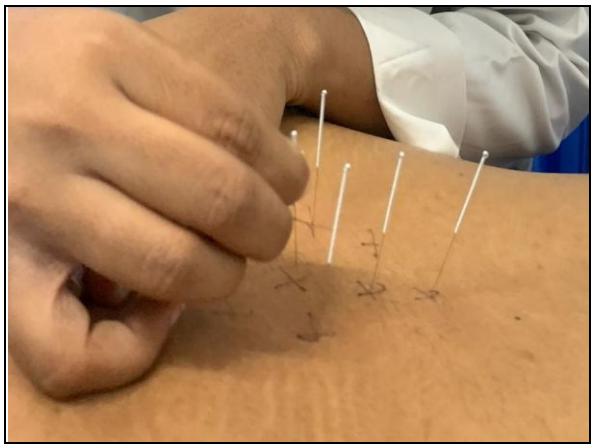
Scope of further Research

- The size of sample was small to draw a generalised conclusion, hence similar study can be conducted on large population.
- Viddhagnikarma can be tried at different temperature(heat).
- Study can be done on Depth of insertion of needle for achieving proper result.
- Study can be done on invention of newer instrument for guiding the needle to the intended depth during insertion.
- Study can be done on the spacing between the needles, the area to be covered, while inserting the needle.

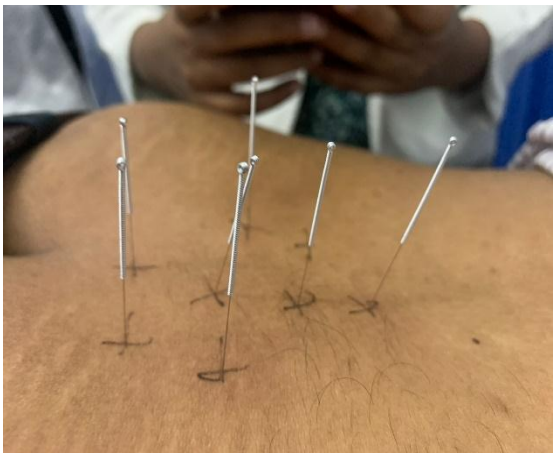
VIDDHAGNIKARMA

Marking the tender Points

Tender Points



Inserting the Needle



Inserted needles over tender points

Agnikarma by Cautery pin

Jathyadi Ghrita Application

PANCHADHATUSHALAKA AGNIKARMA

Marking tender points

Part preparation

Application of Spirit

Shalaka Heated to Red Hot

Agnikarma with Red hot Shalaka

Application of Jathyadi Ghrita

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