Original Article

Evaluation of effect of poultice *(Upanaha Sweda)* in low back pain *(Katigraha)*: A randomized comparative clinical trial

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Abstract

Background: *Katigraha* (low back pain) is a condition where low back is afflicted either with *Vata* or *Sama Vata* (*Vata* involved with the toxins released due to altered digestion and metabolism) and present with symptoms such as pain with stiffness. About 60%–80% population in India suffer from this condition. *Upanaha Sweda* (poultice) is one of the *Swedana* (sudation) treatment modalities mentioned for *Katigraha*. As *Sama* (affected with toxins released from impaired digestion) and *Nirama* (without toxins) are two stages of *Katigraha*, hence, the specific type of *Upanaha* is required for such condition. **Aims and Objective:** The study was conducted to evaluate the effect of *Upanaha Sweda* in *Katigraha* (low back pain) as per the presentation of stages of *Ama*. **Materials and Methods:** Selected patients were categorized into two groups. In group A, patients having *Samaja Katigraha*, were given *Panchakoladi Upanaha* once a day till it became *Niramaja*, then shifted to *Godhumadi Upanaha* for 7 days and patients who had *Niramaja Katigraha, Godhumadi Upanaha* was used once a day for 7 days. In group B *Godhumadi Upanaha* was used once a day for 7 days irrespective of stages. Subjective parameters assessed were pain in the low back, stiffness, and Oswestry Disability Index (ODI) was also used. The Mann–Whitney U test and Wilcoxon signed-rank test were used to assess results. **Results:** Patients who were treated considering the *Sama* and *Nirama* phases had 78.88% better results in relieving pain, stiffness, and in ODI change than the patients treated without considering the phases. **Conclusion:** The present study showed significant results in both the groups, but patients treated as per stage wise treatment showed better effect in treating *Katigraha* than the patients treated with out considering the stage.

Keywords: *Katigraha,* low back pain, *Swedana*, *Upanaha*

Introduction

Vata Dosha or *Sama Vata Dosha* (*Vata Dosha* associated with *Aama* [the toxins released due to altered digestion and metabolism] when afflicts *Kati Pradesha* (low back) and produce the symptoms such as pain with stiffness, then the condition is known as *Katigraha*.[1]

This can be correlated with low back pain. It is the most common disorder which is characterized by dull or sharp pain and may also associated with stiffness. About 60%–80% of the general population in India suffer from low back pain during their life time[2] due to several stressful factors seen in their professional or social life and also due to wrong postural habits. It affects both men and women alike and common in the age group of 20–60 years.

Upanaha Sweda (poultice) is one of the *Swedana* (sudation) treatment modalities mentioned for *Katigraha*.[3-7] The selection of drugs varies according to the stages of the disease. As there are two stages mentioned in *Katigraha* that is *Samaja* (with *Ama*) and *Niramaja* (without *Ama*),[1] specific type of *Upanaha* is required for each stage,[8] but generally only one type of *Upanaha* is being applied for both the conditions irrespective of stages, due to which its efficacy might get reduced. *Panchakoladi Upanaha* consists of *Chavya* (*Piper retrofractum* Vahl.), *Chitraka* (*Plumbago zeylanica* Linn.), *Pippalimula* (*Piper longum* Linn.), *Pippali* (*Piper longum* Linn.), *Shunthi* (*Zingiber officinale* Roscoe.), *Yava* (*Hordeum vulgare* Linn.) and *Nirgundi* (*Vitex negundo* Linn.) that are helpful in resolving

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Access this article online

Quick Response Code:

Website: www.ayujournal.org

DOI: 10.4103/ayu.AYU_71_18

How to cite this article: Kumar T, Sanapeti RV, Prasad BS. Evaluation of effect of poultice *(Upanaha Sweda)* in low back pain *(Katigraha):* A randomized comparative clinical trial. Ayu 2019;40:159-63.

Submitted: 24-Apr-2018 **Revised:** 26-Jun-2018
Accepted: 21-Aug-2019 **Published:** 08-Aug-2020

of toxins released due to impaired digestion and *Godhumadi Upanaha* consists of *Godhuma* (*Triticum sativum* Linn.), *Tila* (*Sesamum indicum* Linn.), *Erandamula* (*Ricinus communis* Linn.) that are helpful in treating *Vata* condition. Hence, study has been carried out to evaluate the effect of *Upanaha Sweda* in as per the stage of *Katigraha* (low back pain).

Materials and Methods

The study was registered under the Clinical Trials Registry – India (CTRI/2017/04/008417) and ethical clearance had been obtained (BMK/13/PG/PK/05). Informed consent was taken before starting the trial in each subject. Forty-one patients of *Katigraha* fulfilling the inclusion criteria were enrolled irrespective of sex, religion, etc. Five patients dropped out due to personal reasons and 36 patients completed the study as mentioned in Table 1. Selected patients were first openly categorized into two groups: *Samaja Katigraha* and *Niramaja Katigraha*. Then, these patients were again categorized into two groups according to the computer-generated randomization chart. In group A (*Avasthanusara* [stage wise] treatment), patients presenting with *Samaja Katigraha*, *Panchakoladi Upanaha* was given once a day till the *Nirama* symptoms appeared and then *Godhumadi Upanaha* was used once a day for 7 days and the patients presenting with *Niramaja Katigraha*, *Godhumadi Upanaha* was used once a day for 7 days. Whereas in group B (*Anavasthanusara* [without considering stages] treatment), *Godhumadi Upanaha* was used for 7 days irrespective of stages.

Diagnostic criteria

a. Pain at low back
b. Stiffness at low back
c. *Sama* symptoms, i.e., heaviness in the body, anorexia, poor digestion, excessive salivation and laziness.
d. *Nirama* symptoms, not having either of heaviness in the body, anorexia, poor digestion, excessive salivation and laziness.

Inclusion criteria

a. Patients presenting with classical symptoms of *Katigraha* such as pain and stiffness at low back.
b. The patients who are fit for *Swedana* (sudation)
c. The age group between 20 and 60 years of either sex.

Exclusion criteria

a. Low back pain resulting from osteoporotic fractures, infections, neoplasm, other mechanical derangements
b. Patient associated with any other systemic disorders
c. Patients with a history of trauma
d. Known case of skin allergy and open wound
e. Post surgical backache.

Table 1: Distribution of registered patients of *Katigraha*

Group		Completed		Drop out	Total Registered	
A	18	9 (*Samaja*)	01	03	10 (*Samaja*)	21
		9 (*Niramaja*)	02		11 (*Niramaja*)	
B	18	9 (*Samaja*)	01	02	10 (*Samaja*)	20
		9 (*Niramaja*)	01		10 (*Niramaja*)	

Ingredients of *Upanaha* 1 and *Upanaha* 2

Ingredients of *Upanaha* 1 (*Panchakoladi Upanaha*) and *Upanaha* 2 (*Godhumadi Upanaha*) are mentioned in Table 2.

Preparation and application of *Upanaha*

Materials required for preparation of Upanaha

Tila Taila (sesame oil) 10 ml for local massage, *Saindhava Lavana* (rock salt) - 30 g, cotton bandage - 6 inches (2 pieces), *Eranda* (*Ricinus communis* Linn.) leaves - (4–5), heating apparatus, pan, table spoon, bowl, thermometer and massage table.

Preparation of paste

All the medicinal powder mentioned in Table 2 were taken in a pan as per the group. Then, 200 ml *Dhanyamla* (fermented gruel) and 200 ml cow milk was added to *Panchakoladi Upanaha* and *Godhumadi Upanaha* respectively and mixed well. Then, 30 g *Saindhava Lavana* (rock salt) and *Tila Taila* (sesame oil) as per need were added to it for the poulitce and mixed well to make its consistency like dough.

Main procedure

The patient was instructed to lie in the prone position on the massage table. Low back was exposed and the skin sensitivity was checked for temperature or any allergy. Local massage was done with *Tila Taila* (sesame oil) for 5 min. The prepared paste was then pasted over the low back uniformly of about 5 mm thickness. It was covered with proper-shaped *Eranda* leaves. Then, it was tied with a cotton bandage for 6 h (360 min).

Post operative procedure

After removal of *Upanaha* (poultice), gentle massage was done and the part was cleaned well with lukewarm water and the patient was asked to move the joint slowly.

Upanaha Dharana Kala (duration of Upanaha retention)

Panchakoladi Upanaha- 6 h/day till *Niramaja* symptoms like reduction in the stiffness and feeling of lightness at low back and activeness in the body appears parameters:

Godhumadi Upanaha- 6 h/day for 7 days.

Assessment criteria

Patients were assessed before and after the treatment on the basis of following parameters:

Assessment of subjective criteria

The assessment criteria for pain and stiffness are given in Tables 3 and 4, respectively.

Visual Analog Scale: (for assessment of pain in grade 0 to 10).

Table 2: Ingredients of *Upanaha* 1 and *Upanaha* 2

Ingredients	*Upanaha* 1 (*Panchakoladi Upanaha*)	Quantity	*Upanaha* 2 (*Godhumadi Upanaha*)	Quantity
Medicinal powder	*Chavya* (*P. retrofractum* Vahl.) powder	10 g-15 g	*Godhuma* (*T. sativum* Linn.) powder	50 g-75 g
	Chitraka (*P. zeylanica* Linn.) powder	10 g-15 g	*Tila* (*S. indicum* Linn.) paste	30 g-45 g
	Pippalimula (*P. longum* Linn.) powder	10 g-15 g	*Erandamula* (*R. communis* Linn.) powder	100 g-125 g
	Pippali (*P. longum* Linn.) powder	10 g-15 g		
	Shunthi (*Z. officinale* Roscoe.) powder	10 g-15 g		
	Yava (*H. vulgare* Linn.) powder	50 g-75 g		
	Nirgundi (*V. negundo* Linn.) powder	50 g-75 g		
Drava Dravya (liquids)	*Dhanyamla* (fermented gruel)	200 ml -300 ml	*Gokshira* (cow milk)	200 ml -300 ml
	Saindhava Lavana (rock salt)	30 g	*Saindhava Lavana* (rock salt)	30 g
Oil	*Tila Taila* (sesame oil)	20 ml-30 ml	*Tila Taila* (sesame oil)	40 ml-60 ml

P. retrofractum: Piper retrofractum, P. zeylanica: Plumbago zeylanica, P. longum: Piper longum, Z. officinale: Zingiber officinale, H. vulgare: Hordeum vulgare, V. negundo: Vitex negundo, T. sativum: Triticum sativum, S. indicum: Sesamum indicum, R.communis: Ricinus communis

Statistical analysis

Oswestry disability index total score

Pain, stiffness and Oswestry Disability Index (ODI) changes were assessed on comparing their values after applying Mann–Whitney U test and Wilcoxon signed-rank test.

Observations

Table 5 shows that out of 36 cases of *Katigraha*, 41–60 years (69.44%) of age group people were found more affected than 20–30 years (11.11%) and 31–40 years (19.44%); Table 6 shows that males (52.78%) were found more affected with low backache than females (47.22%); Table 7 shows that farmers and labourers (27.78%) and homemakers (33.33) were more prone to low backache than private job workers (16.67%), teachers (13.88%), policeman (2.78%) and tailors (5.56%); Table 8 shows that prolong standing posture (38.89) persons are more prone to low backache than prolong sitting postures (30.56%) and continuous travellers (8.33%).

Results

Results of the treatment in both the groups are mentioned in Tables 9 and 10.

Table 9 shows that 18 patients of *Katigraha* when treated according to *Avastha* (stages) showed 43.33% effect with $P < 0.0001$ in relieving pain, 36.07% effect with $P = 0.0002$ in reducing stiffness, and 37.25% effect with $P < 0.0001$ in improving ODI index and another 18 patients of *Katigraha* when treated without assessing the *Avastha* (stages) showed 27.20% effect with $P < 0.0001$ in relieving pain, 15.73% effect with $P = 0.0204$ in reducing stiffness, and 18.44% effect with $P < 0.0001$ in improving of ODI index.

Table 9 also shows that there was a significant difference between the two groups with $P = 0.0107$ in relieving pain, with $P = 0.0351$ in reducing stiffness and with $P = 0.0002$ in improving of ODI index.

Table 10 shows that 9 patients of *Samaja Katigraha* when treated according to *Avastha* (stages) had 50.96% effect with $P < 0.0001$ in relieving pain, 55.5% effect with $P < 0.0001$ in reducing stiffness, and 40.40% effect with $P < 0.0001$ in improving ODI index and another 9 patients of *Samaja Katigraha* when treated without assessing the *Avastha* (stages) showed 21.41% effect with $P = 0.0278$ in relieving pain, 11% effect with $P = 0.1690$ in reducing stiffness, and 16.16% effect with $P = 0.0058$ in improving of ODI index.

Table 10 also shows that there was a significant difference between the results in *Samaja Katigraha* of the two groups with $P = 0.0016$ in relieving pain, with $P = 0.0002$ in reducing stiffness and with $P = 0.0013$ in improving of ODI index.

Table 3: Assessment and grading of pain

Pain (VAS)	Scale	Grade
No pain	0	0
	1	
Mild, annoying pain	2	1
	3	
Nagging, uncomfortable, troublesome pain	4	2
Distressing, miserable pain	5	3
	6	
	7	
Intense, dreadful, horrible pain	8	4
	9	

Table 4: Assessment and grading of stiffness (range of motion)

Stiffness (ROM)	Grade
No stiffness	0
With up to 25% impairment in ROM of joint and patient can perform daily work without any difficulty	1
With up to 25%-50% impairment in the ROM of joint and patient can perform daily routine work with mild or moderate difficulty	2
With up to 50%-75% impairment in ROM of joint and patient can perform daily routine work with moderate or severe difficulty	3
With >75% impairment in ROM of joint and patient totally unable to perform daily routine work	4

ROM: Range of motion

Table 5: Age wise distribution of patients

Age (Years)	*Avasthanusara* Group		*Anavasthanusara* Group		Total	
	No.	%	No.	%	No.	%
20-30	03	16.16	01	5.56	04	11.11
31-40	04	22.22	03	16.67	07	19.44
41-60	11	61.11	14	77.77	25	69.44

Table 6: Distribution of patients according to gender

Sex	*Avasthanusara* Group		*Anavasthanusara* Group		Total	
	No.	%	No.	%	No.	%
Male	09	50	10	55.56	19	52.78
Female	09	50	08	44.44	17	47.22

Table 7: Distribution of patients on the basis of occupation

Occupation	*Avasthanusara* Group		*Anavasthanusara* Group		Total	
	No.	%	No.	%	No.	%
Farmer/Labor	06	33.33	04	22.22	10	27.78
Teacher	03	16.67	02	11.11	05	13.88
Private job	04	22.22	02	11.11	06	16.67
House wife	05	27.77	07	38.88	12	33.33
Policeman	00	00	01	5.55	01	2.78
Tailor	00	00	02	11.11	02	5.56

Table 8: Distribution of patients on the basis of postural details

Postural Details	*Avasthanusara* Group		*Anavasthanusara* Group		Total	
	No.	%	No.	%	No.	%
Prolonged sitting	06	33.33	05	27.78	11	30.56
Prolong standing	07	38.89	07	38.89	14	38.89
Continuous travel	01	5.56	02	11.11	03	8.33
Not related	04	22.22	04	22.22	08	22.22

Discussion

Of 36 cases of *Katigraha* males, prolong standing posture, moderate working lifestyle, labourers, and homemakers were affected more with *Katigraha* might be because they have to do more laborious work and prolong standing posture exerts pressure over low back and provides favorable condition for lodging *(Sthana Samshraya)* of already vitiated *Vata Dosha*. Age-wise distribution showed that 40–60 years of age group were found more prone to *Katigraha* because degenerative changes starts in this age group that leads to *Vata* vitiated disorders.

The effect of *Avasthanusara* treatment is better than *Anavasthanusara* treatment might be because:

a. Pain is the symptom of *Vata Dosha*. Drugs used in *Panchakoladi Upanaha* were having *Ushna* (hot) and *Tikshna* (sharp) properties, so it did *Doshavilayana* (liquefaction of *Dosha*) and *Srotoshodhana* (purification of channels) which helped in relieving *Margavarana* (obstruction in channels) of *Vata Dosha*, followed by *Godhumadi Upanaha* that is having *Snigdha* (unctuous) property along with *Ushna* property, that helped in pacifying *Vata Dosha,* thus helped in relieving pain
b. Stiffness is either due to *Sheeta* (cold) – *Ruksha* (dry) properties of *Vata* or *Sheeta* - *Snigdha* properties of *Ama*. Drugs used for *Panchakoladi Upanaha* are having *Ushna*, *Ruksha* and *Tikshna* properties which helped in pacifying *Sheeta* - *Snigdha* properties of *Ama* efficiently
c. *Avasthanusara* treatment had a significant effect on reducing pain and stiffness both, thus it helped in improving quality of life of the patients. Although *Anavasthanusara* treatment group provided effect on reducing pain and stiffness, but as it is having *Amaja* stage of patients and were treated without considering stages, it was not effective statistically.

Probable mode of action of *Upanaha*

The lipoidal bond is suitable for penetration of drug molecule through stratum corneum.[9] On this basis, it can be assumed that in *Upanaha*, oil helps in the formation of lipoidal bond with other drugs thus helps in the penetration of drug molecules. *Upanaha* is a type of *Swedana,* so it induces hyperthermia which improves local blood and lymphatic circulation and thereby improving local tissue metabolism.[10] It reduces inflammation by modifying secretion of various inflammatory mediators, relaxes local musculature by physical effect of heat, increases the rate of transdermal drug delivery and thereby reduces pain.[11]

The drugs used for *Panchakoladi Upanaha* are having alkaloids such as piperine[12] (in *Pippali*), terpenoids[13] (in *Chavya*), gingerol[14] (in *Shunthi*), tannins,[15] and saponins[16] (in *Yava*), thus they inhibit prostaglandins (acting as a vasodilators and cause inflammation[17]), which, in turn, may reduce the inflammation.

Drugs used in *Panchakoladi Upanaha* are *Ushna*, *Tikshna* in nature and due to its counter irritant effect, helped in relieving pain.

Conclusion

Patients of low back pain treated with *Avasthanusara* (stage wise treatment) had better effect in relieving pain, stiffness and in Oswestry Disability Index (ODI) change than the patients treated with *Anavasthanusara Upanaha Sweda* without stage wise treatment. Also, patients of *Samaja Katigraha* treated with *Panchakoladi Upanaha* had better effect in relieving pain, stiffness and in ODI change than the patients of *Samaja Katigraha* treated with *Godhumadi Upanaha*. Thus, it can be concluded that *Panchakoladi Upanaha* was effective in relieving *Samaja* stage of *Katigraha* and *Avasthanusara* treatment is more effective in the management of *Katigraha* than that of *Anavasthanusara*

Table 9: Results of the treatment on parameters of low back pain

Parameter	Group	Mean±SD		Improvement (%)	*Z*	Significance/*P*
		BT	AT			
VAS	*Avasthanusara* treatment	5.11±0.74	2.89±0.99	43.33	10.00	<0.0001
	Anavasthanusara treatment	4.89±1.24	3.56±1.3	27.2	5.49	<0.0001
	Between the groups				2.7	0.0107
Stiffness	*Avasthanusara* treatment	1.83±0.6	1.17±0.76	36.07	4.76	0.0002
	Anavasthanusara treatment	1.78±0.71	1.5±0.76	15.73	2.56	0.0204
	Between the groups				2.19	0.0351
ODI	*Avasthanusara* treatment	47.11±6.41	29.56±9.04	37.25	9.47	<0.0001
	Anavasthanusara treatment	45.44±10.87	37.06±10.9	18.44	7.69	<0.0001
	Between the groups				4.26	0.0002

SD: Standard deviation, VAS: Visual analog scale, ODI: Oswestry Disability Index, BT: Before treatment, AT: After treatment

Table 10: Results of the treatment in *Samaja Katigraha*

Parameter	Group	Mean±SD		Improvement (%)	*Z*	Significance/*P*
		BT	AT			
VAS	*Avasthanusara* treatment	5.22+0.63	2.56+0.83	50.96	11.31	<0.0001
	Anavasthanusara treatment	4.67+1.25	3.67+1.33	21.41	2.68	0.0278
	Between the groups				3.78	0.0016
Stiffness	*Avasthanusara* treatment	2+0.47	0.89+0.57	55.5	10.00	<0.0001
	Anavasthanusara treatment	2+0.67	1.78+0.63	11	1.51	0.1690/ns
	Between the groups				4.82	0.0002
ODI	*Avasthanusara* treatment	48.11+5.74	28.67+7.92	40.40	8.58	<0.0001
	Anavasthanusara treatment	46.78+11.45	39.22+12.16	16.16	3.73	0.0058
	Between the groups				3.90	0.0013

SD: Standard deviation, VAS: Visual analog scale, ODI: Oswestry Disability Index, BT: Before treatment, AT: After treatment

treatment.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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