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A COMPARATIVE CLINICAL STUDY OF THE EFFECT OF SHASTHIKASHALI PINDA SWEDANA AND INFRARED RADIATION THERAPY ON JANUSANDHIGATA VATA W.S.R. TO KNEE JOINT OSTEOARTHRITIS

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ABSTRACT

Sandhigatavata is the most common form of joint disorder in the elderly people which affects functions of the joints especially weight bearing joints like knee joint. *Sandhigatavata* can be compared with Osteoarthritis of contemporary medical science. The reported prevalence of osteoarthritis in India is among 1,065,070,607 people 78,314,013 are suffering from osteoarthritis. Here an attempt is made to assess the effect *Shasthikashali Pindasweda* in alleviating the *doshas* and giving relief to cardinal symptoms like *sandhi ruja* and *sopha* and to know the effect of Infra-radiation therapy. The study is aimed to compare the effect of *Shasthikashali Pindaswedana* and infra-red radiation therapy in the management of *Sandhigatavata*. It is a simple comparative clinical trial. The study was done in two groups Group A and Group B each group having 10 patients. Materials used were *Shasthikashali* and Infrared radiation light. Patients of Group A received the *Shasthikashali Pinda Swedana* for 30 minutes, and Patients of Group B received Infra-Red radiation therapy 15 minutes for 7 days. For assessing the results, used subjective parameters were, *Ruk* (Pain), *Graha* (Stiffness), *Sparshaakshamatva* (Tenderness), *Shotha* (Swelling), *Atopa* (Crepitation) and objective parameters were Visual Analogue Scale (VAS) and Range of movements. The assessment parameters were noted before the treatment, after the treatment and follow up. To assess the results, paired and unpaired t test statistical analysis methods were used. According to the statistical analysis Parameters *Sparsha Asahyata, Sandhi* graham and Sandhi *Shotha* were better responded in group B compared to group A, and Parameter *Sandhishoola, Sandhi Sphutana*, Range Of Movement (ROM) and Visual Analogue Scale(VAS)were better responded in group A compared to group B. Statistically there was no much significant difference observed on the overall effect.

Keywords: *Sandhigatavata, ShasthikashaliPindaSweda,* Infrared radiation therapy.

INTRODUCTION

Now-a-days almost everyone is falling sick because of sedentary lifestyle**.** Everybody is living stressful life. Modern human being has created several disturbances in his biological system by changing lifestyle. With more and more adaptation of sedentary lifestyles like excessive use of vehicles, disturbedeating habits, unnecessary excessivetraveling, improper time schedule of sleepand work all have led to increase in the *Vata-dosha*. *SandhigatVata* is one of the endresult of above routine faulty dietetic; habits and irregular lifestyle is responsible for early degenerative changes and play a vital role in the manifestation of such degenerative disorder. In this way, this disease is now becoming a significant threat to the working population. *Sandhigatavata* is a type of *Vatavyadhi* characterized by *vatapurnadrutisparsha, Shotha, Vedana* during *Prasarana* and *Akunchana*[1]. Acharya *Bhavamishra* while explaining *Vatavyadhi* explained about *Sandhigatavata*[2]. Acharya Sushruta[3] and Madhavakara[4] have added *Sandhi Shoola, Atopa, Sandhi Hanti.*

The trouble of *Sandhi* by *PrakupitaVata* is the main phenomenon in *Samprapti* of *SandhigatVata. Sandhis* come under the *MadhyamaRogaMarga* and thus, involvement of *MadhyamaRogaMarga, VataDosha* and *Dhatukshaya* figures disease *KashtaSadhya*. In this point of view, Ayurveda has a unique approach to cure i.e. two-fold strategies comprising of 1) *Samshodhana* or Bio purification by Panchakarma therapy & related measures. 2) *Samshamana* or Palliation of imbalances by appropriately planned diet, drug, & lifestyle interventions. *Swedana* is one among the *poorvakarma*s of *Samshodhanachikitsa.* The process which relieves *stambha* (stiffness), *gourava* (heaviness), *sheeta* (coldness) and which induce *sweda* (sweating) is known as *Swedana karma*[5,6]. In general, *Swedana karma* represents the therapy by which a person is made to sweat. *Swedana* is useful in *Vata, Kapha* and *Vatakaphaja disorders*[7]. But, it is not recommended in disorders due to excitement of *Pitta.*

Even though, *swedana* is *poorva karma*, it has its own entity as *pradhanakarma* in some diseases. *Acharya* Charaka included *Swedana karma* in *Shadupakramas* and he has treated it as main therapy[8]. For *samshodhana* purpose, it is considered as *poorva karma*. In *swedanasadhya* diseases it acts as main therapy. Acharya Charaka has indicated *Swedana karma* in *Janu Ruk* and *Janu graham* which can be considered as *Janusandhigatavata. Shasthikashali Pinda Swedana*[9] is a type of *Sankaraswedana* in which medicated drugs are taken in the form of *Pottali* (bolus) and applied over the affected part.

Infrared radiations are included under radiation therapy which is type of heat therapy. Heat from infrared radiations causes vasodilatation which helps in increasing nutrition supply and drainage of waste products resulting in relief of pain. Sedative effects on the sensory nerve endings aid in pain relief and helps to release muscle spasm. It is widely used in osteoarthritis condition.[10] Hence to compare the efficacy of these two treatment modalities the present study had been undertaken.

Aim and Objectives:

1. To evaluate the effect of *ShasthikashaliPindaSwedana* in the management of *Sandhigatavata.*
2. To evaluate the effect of infra-red radiation therapy in the management of *Sandhigatavata*
3. To compare the effect of *ShasthikashaliPindaswedana* and infra-red radiation therapy in the management of *Sandhigatavata*

Materials and Methodology:

Selection of Patients: Patients were selected randomly with symptoms of *Janusandhigatavata* irrespective of sex, religion, age etc. from OPD and IPD Department of Panchakarma, RGES Ayurvedic Medical College and Hospital, Ron. Patients were then subjected to detailed clinical history based on specially prepared case proforma. Then the patients are randomly placed by coin method into two groups having 10 patients in each group. Patients of Group A received the *Shasthikashali Pinda Swedana* for 30 minutes, and Patients of Group B received Infra-Red radiation therapy 15 minutes for 7 days. Clinical Dataobtained from the trial was analyzed withpaired t -test method & the results are presented.

Inclusion Criteria: -

1. Patients having textual symptoms of *Sandhigatavata – niramaavastha* with special reference to *janu sandhi* were taken as a subject to study.
   - *Sandhi Shoola*
   - *Sandhi Shotha*
   - *Vatapurna Druti Sparsha*
   - *Graha* (Restricted movement)
2. Patients who are fit for *Swedana* and Infrared Radiation therapy.
3. Patient who were ready to give written consent.

Exclusion Criteria:

1. Patients with other joints deformities or diseases which are not related to *JanuSandhigatavata,* such as *Amavata, Vatarakta*.
2. Patient with rheumatic arthritis, tubercular arthritis, infective arthritis, syphilitic arthritis, gout, traumatic arthritis, and gonorrheal arthritis, fracture of Knee joint and those who needed surgical care were excluded.
3. Neoplasm
4. Permanent joint damage.
5. Known cases of Cardiac disease, Pulmonary TB, Pregnancy, DM, Paralysis, HIV, Neurological disorders.
6. Having severe crippling deformity.

Interventions:

20 clinically diagnosed patients of knee joint osteoarthritis. Patients were equally and randomly divided into two groups.

Group A (*Shasthikashali Pinda Swedana* group) - 10 patients.

Group B (Infrared Radiation therapy group) - 10 patients.

Therapy and Duration:

Group A:

- ***Poorva karma:*** *Sthanika Abhyanga* with *Moorchita Tilataila* was performed to affected knee joint.
- ***Pradhana karma:*** *Shasthikashalipindaswedana* was performed for 30 minutes each day.
- ***Paschat karma:*** *Pariharavishaya* of *swedana* was followed.

Group B:

- ***Poorva karma:*** *Sthanika Abhyanga* with *Moorchita Tilataila* was performed to affected knee joint.
- ***Pradhana karma:*** At the start of the treatment exposure, the intensity of the radiation should be low, but after 5-10 minutes when Vaso-dilation has taken place and the increased blood flow has become established, the strength of the radiation may be increased. This can be achieved by moving the lamp closer to the patient or by adjusting the variable resistance. Infrared Radiation therapy was performed for 15 minutes each day.

Duration of treatment: 7 days.

Follow up: 7th day, 15th day and 30th day.

Total duration of study: 30 days.

Assessment Criteria

Assessment of the result were done based on the following grading.

Sandhishula **(Pain)**	**Grade**
• No pain	0
• Mild pain	1
• Moderate pain but no difficulty in walking	2
• Severe pain and difficulty in walking	3

SparshaAsahyata**(Tenderness)**	**Grade**
• No tenderness	0
• Patient feels tenderness	1
• Winching of face on touch	2
• Does not allow to touch the joint	3

Sandhigraha**(Stiffness)**	**Grade**
• No stiffness	0
• Mild stiffness	1
• Moderate stiffness	2
• Severe stiffness	3

Sandhishotha**(Swelling)**	**Grade**
• No swelling	0
• Mild swelling	1
• Moderate swelling	2
• Severe swelling	3

Sandhisphutana **(Crepitus)**	**Grade**
• No crepitus	0
• Palpable crepitus	1
• Audible crepitus	2

Restriction of movement (ROM) Grade

- Absence of movement restriction. 0
- Restriction of movement <25% 1
- Restriction of movement 25% - 50% 2
- Restriction of movement > 50% 3

Visual Analogue Scale (VAS): Grade

- 0 cm. 0
- 1-3 cms 1
- 4-6 cms. 2
- 7-10 cms. 3

Overall assessment of clinical response:

- Good Response: 75 % and more improvement in overall clinical parameters.
- Moderate Response: 50%-75% improvement in overall clinical parameters.
- Mild Response: 25%- 50% improvement in over-all clinical parameters.
- No Response: Nothing has been changed

Observations and results:

Gender – Gender wise distribution of patient data

In both group A & B group female patients were more than male patients

This data shows that female is more prone to *Janusandhigatavata* than male.

Table 1: Showing Gender wise distribution of patient data

Gender	Group A		Group B	
	Frequency	Percentage	Frequency	Percentage
Male	4	40	3	30.0
Female	6	60	7	70.0
TOTAL	10	100.0	10	100.0

Table 2: Showing age wise distribution of patient data.

Age Group	Group A		Group B	
	Frequency	Percentage	Frequency	Percentage
30-40 Years	3	30	2	20
40-50 Years	6	60	5	50
50-60 years	1	10	3	30
TOTAL	10	100.0	10	100.0

Table 3: Showing Diet wise distribution of patient data

Diet	Group A		Group B	
	Frequency	Percentage	Frequency	Percentage
Irregular	6	60.0	7	70.0
Regular	4	40.0	3	30.0
TOTAL	10	100.0	10	100.0

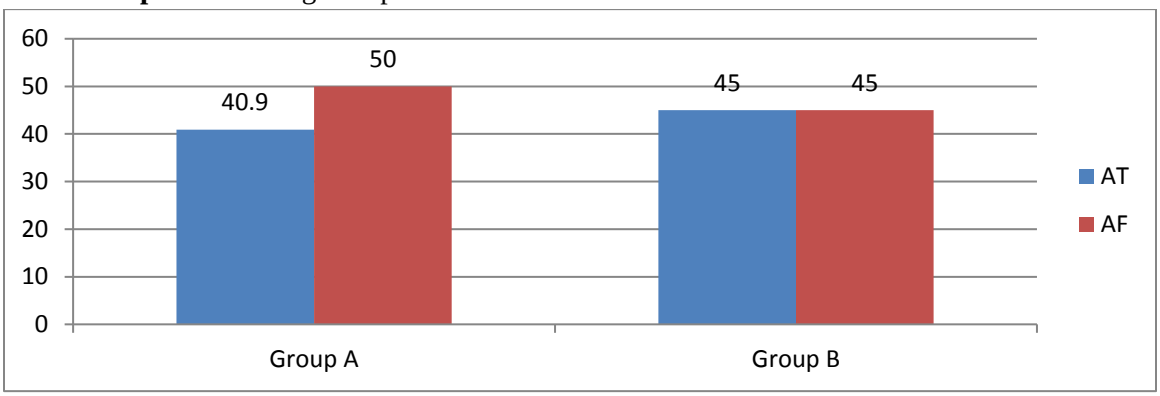
Effect of the Treatment on different Parameters

1. Sandhi Shoola

Table 4: Showing Comparison of effect of Treatment on Parameter Sandhi Shoola

Parameter	Group A		improve %	Group B		improve %	Un paired t test			
							SD	T-value	P- value	Remark
Ruk	BT	2.2	-	BT	2	-	0.63	1.0	0.34	NS
	AT	1.3	40.9	AT	1.1	45				
	AF	1.1	50	AF	1.1	45				

Graph 1: Showing Comparison of effect of Treatment on Parameter *Sandhi shoola*



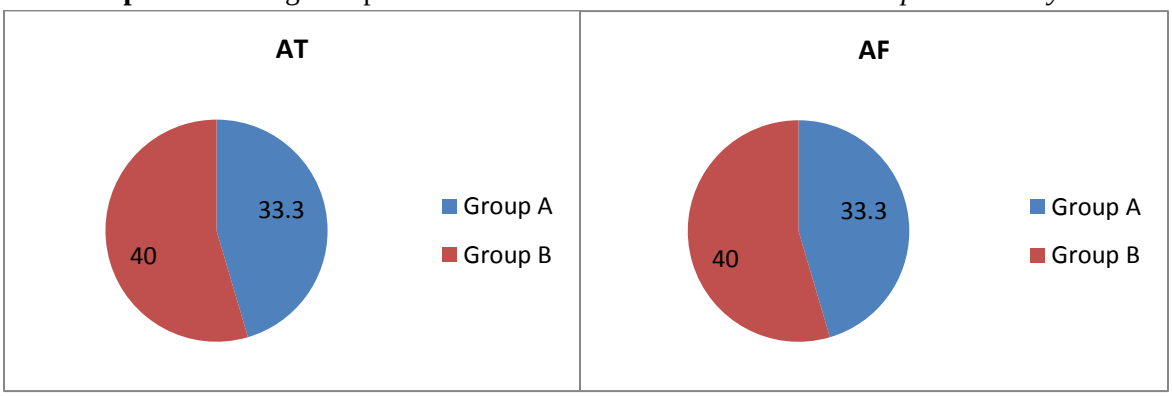
On baseline visit, the mean *Sandhishoola* scores of Group A and Group B were 2.2 and 2 respectively, which were reduced significantly to 1.3 and 1.1 respectively after 7 days of treatment and 1.1 and 1.1 respectively after 30 days of follow up. But when we compare the effect of two groups there was no significant difference statistically.

2. Sparsha Asahyata

Table 5: Showing Comparison of effect of Treatment on Parameter *Sparsha Asahyata*

Parameter	Group A		Improve %	Group B		Improve %	Un paired t test			
							SD	T-value	P- value	Remark
Sparsha Asahyata	BT	0.9	-	BT	1	-	0.73	0.42	0.67	NS
	AT	0.6	33.3	AT	0.6	40				
	AF	0.6	33.3	AF	0.6	40				

Graph 2: Showing Comparison of effect of Treatment on Parameter *Sparsha Asahyata*



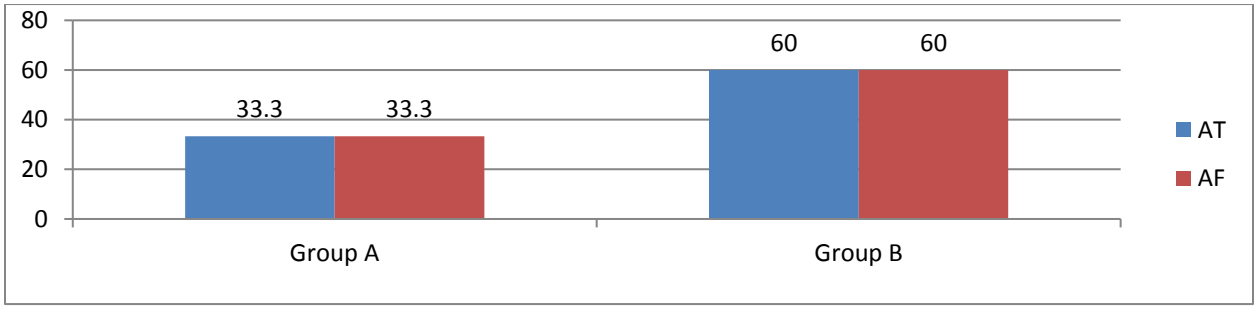
On baseline visit, the mean *Sparsha Asahyata* scores of Group A and Group B were 0.9 and 1 respectively, which were reduced significantly to 0.6 and 0.6 respectively after 7 days of treatment and they remained same after 30 days of follow up. But when we compare the effect of two groups there was no significant difference statistically.

3. Sandhigraha

Table 6: Showing Comparison of effect of Treatment on Parameter *Sandhigraha*

Parameter	Group A		Improve %	Group B		Improve %	Un paired t test			
							SD	T-value	P- value	Remark
Sandhigraha	BT	0.3	-	BT	0.5	-	0.42	1.5	0.16	S
	AT	0.2	33.3	AT	0.2	60				
	AF	0.2	33.3	AF	0.2	60				

Graph 3: Showing Comparison of effect of Treatment on Parameter *Sandhigraha*



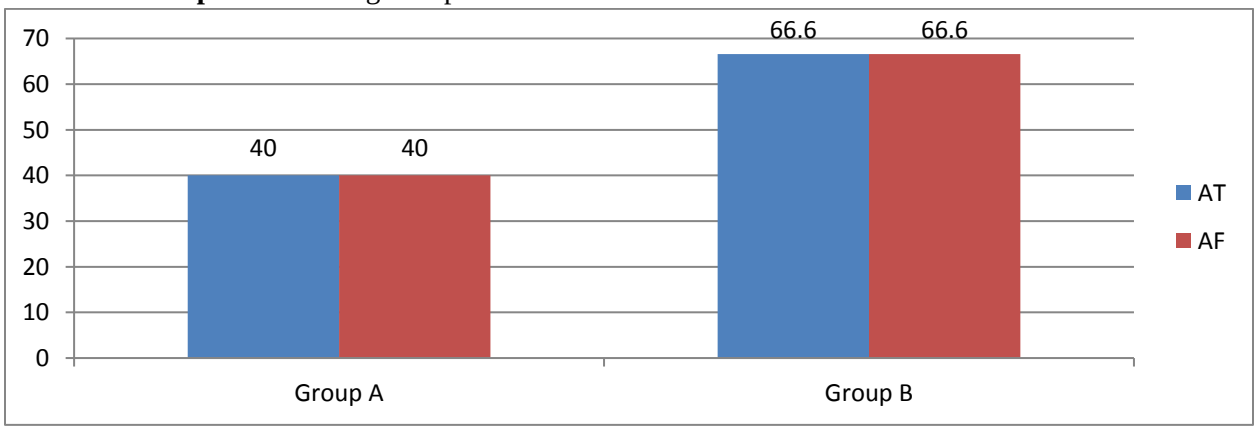
On baseline visit, the mean *Sandhigraha* scores of Group A and Group B were 0.3 and 0.5 respectively, which were reduced significantly to 0.2 and 0.2 respectively after 7 days of treatment and they remained same after 30 days of follow up. But when we compare the effect of two groups there was significant difference statistically with p value 0.16. This shows that group B is having more efficacy than group A.

4. Sandhishotha

Table 7: Showing Comparison of effect of Treatment on Parameter *Sandhishotha*

Parameter	Group A		improve %	Group B		Improve %	Un paired t test			
							SD	T-value	P- value	Remark
Sandhi shotha	BT	1.5	-	BT	1.2	-	0.42	1.5	0.16	S
	AT	0.9	40	AT	0.4	66.6				
	AF	0.9	40	AF	0.4	66.6				

Graph 4: Showing Comparison of effect of Treatment on Parameter *Sandishotha*



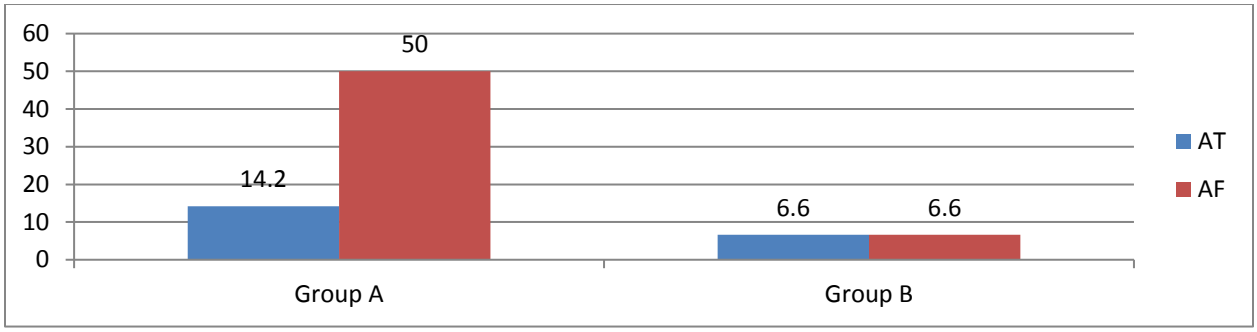
On baseline visit, the mean *Sandhishotha* scores of Group A and Group B were 1.5 and 1.2 respectively, which were reduced significantly to 0.9 and 0.9 respectively after 7 days of treatment and they remained same after 30 days of follow up. But when we compare the effect of two groups there was significant difference statistically with p value 0.16. This shows that group B is having more efficacy than group A.

5. *Sandhi Sphutana*

Table 8: Showing Comparison of effect of Treatment on Parameter *Sandhi Sphutana*

Parameter	Group A		improve %	Group B		improve %	Un paired t test			
							SD	T-value	P- value	Remark
Sandhi sphutana	BT	1.4	-	BT	1.5	-	0.51	3.67	0.005	HS
	AT	1.2	14.2	AT	1.4	6.66				
	AF	0.7	50	AF	1.4	6.66				

Graph 5: Showing Comparison of effect of Treatment on Parameter *Sandhi Sphutana*



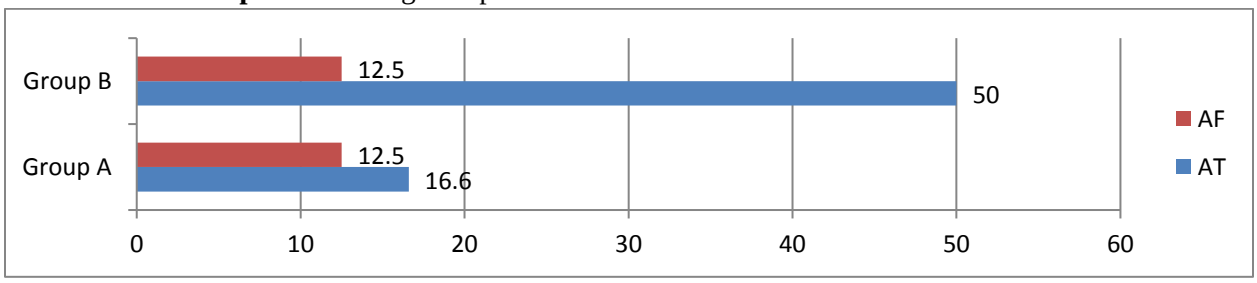
On baseline visit, the mean *Sandhisphutana* scores of Group A and Group B were 1.4 and 1.5 respectively, which were reduced to 1.2 and 1.4 respectively after 7 days of treatment and 0.7 and 1.4 respectively after 30 days of follow up. But when we compare the effect of two groups there was highly significant difference statistically with p value 0.005. This shows that group A is having more efficacy than group B.

6. Range Of Movement (ROM)

Table 9: Showing Comparison of effect of Treatment on Parameter ROM

Parameter	Group A		improve %	Group B		improve %	Un paired t test			
							SD	T-value	P- value	Remark
ROM	BT	1.2	-	BT	0.8	-	0.70	2.23	0.05	S
	AT	1	16.6	AT	0.7	12.5				
	AF	0.6	50	AF	0.7	12.5				

Graph 6: Showing Comparison of effect of Treatment on Parameter ROM

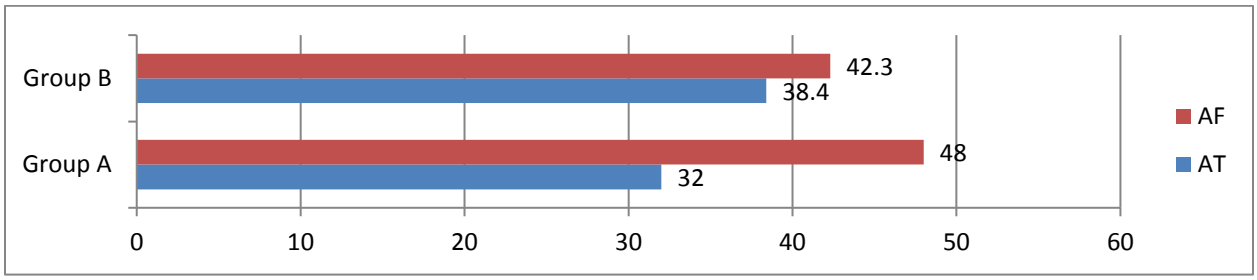


On baseline visit, the mean ROM scores of Group A and Group B were 1.2 and 0.8 respectively, which were reduced significantly to 1 and 0.7 respectively after 7 days of treatment and 0.6 and 0.7 respectively after 30 days of follow up. But when we compare the effect of two groups there was highly significant difference statistically with p value 0.005. This shows that group A is having more efficacy than group B.

7. Visual Analogue Scale (VAS)

Table 10: Showing Comparison of effect of Treatment on Parameter VAS

Parameter	Group A		improve %	Group B		improve %	Un paired t test			
							SD	T-value	P- value	Remark
VAS	BT	2.5	-	BT	2.6	-	0.78	0.80	0.44	NS
	AT	1.7	32	AT	1.6	38.4				
	AF	1.3	48	AF	1.5	42.3				



On baseline visit, the mean VAS scores of Group A and Group B were 2.5 and 2.6 respectively, which were reduced significantly to 1.7 and 1.6 respectively after 7 days of treatment and 1.3 and 1.5 after 30 days of follow up. But when we compare the effect of two groups there was no significant difference statistically.

Table 11: Showing the comparison of the Treatment in Percentage

Parameters	**Group A**	**Group B**
Sandhishula	50	45
SparshaAsahyata	33.33	40
Sandhi graha	33.33	60
Sandhi Shotha	40	66.66
Sandhi Sphutana	50	6.66
ROM	50	12.5
VAS	48	42.3
Average	**43.52**	**39.01**

According to the statistical analysis Parameters *Sparsha Asahyata*, *Sandhi graham* and *Sandhi Shotha* were better responded in group B compared to group A, and Parameter *Sandhishoola*, *Sandhi Sphutana*, Range Of Movement (ROM) and Visual Analogue Scale (VAS) were better responded in group A compared to group B. Statistically there was no much significant difference observed on the overall effect.

DISCUSSION

The process of *Swedana* by means of a bolus *containing tila, masha* etc. with or without wrapping cloth is known as *sankarasweda* or *pindasweda*. It is of two

types viz., *Snighda* & *Rooksha*. *Swedana* is done with the boluses of the seeds of *tila, masha, kulatha* mixed with amla *dravya,* ghee, *taila, mamsa, odana, payasa* and *krishara* is called as *Snigdhapindasweda*. It is specially indicated in *Vatarogas* and is mostly indicated in *ekangarogas*

ShasthikashaliPindaSwedana

Ingredients of the *pindasweda* are of *Snehana* nature and Heat is maintained for more time period inside the *pinda*. Also the *Shasthikashalipinda*s (bolus) are heated often and hence there is no reduction in the amount of heat applied over the body.Hence, the temperature gradient produced is higher which facilitates the absorption of the *Sneha amsha*, being *snighda* and *ushna* corrects the deranged *doshaghatakas* and relieves stiffness. As it is known fact that unless there is a srotodushti there is no disease, by contact of bearable warmth, the area in contact gets more circulation. The Lumina of the contracted body architecture get smoother and wider. This rendering a stiff entity smooth relieves variety of obstructions. Widening of the core and simultaneous liquefaction of the solid or semi-solid material makes the flow easier. Widening of the tract and fluid character of the material inside makes the obstructions released slowly. So *Swedana* clears the *srotodushti* or *sanga*. Cleanses micro channels liquefies the toxic materials and expels toxic materials along with Sweat. It recovers vascular insufficiency of the joints and muscles and produces relaxation. These factors might be responsible for improving blood circulation and local metabolic processes, causing relaxation of local structures and producing relief of local symptoms, functional recovery, and a slowdown of the disease process being treated.

Infra red Radiation Therapy:

The infrared rays are electromagnetic waves with the of 750nm to 400000nm.It lies beyond the red boundary of visible spectrum.

In the Physiotherapy departments Infrared rays are produced by two types of generators 1) Non-Luminous generators 2) Luminous generators

Luminous generator produces Infrared rays having wavelengths between 350nm to 4000 nm. It can penetrate dermis and epidermis of the Subcutaneous tissue.

Non-Luminous generators produce infra-red rays of wavelength 750nm to 15000nm which can penetrate the superficial dermis only.

The depth of penetration depends on the wavelength and the nature of the material. Thus, infra-red rays produce from luminous generator have more penetration power than that produced from non-luminous Generator. So, luminous generator was used.

Arrangement of the lamp and patient: -

The lamp is positioned so that it is opposite to the center of the area to be treated and the rays strike the skin at 90° thus ensuring maximum absorption. The distance of the lamp from the patient should be measured. Optimum distance is around 50-75cm depending upon the output of the generator.

Application of the Infra-red treatment:

At the start of the treatment exposure, the intensity of the radiation should be low,but after 5-10 minutes when Vaso-dilation has taken place and the increased blood flow has become established,the strength of the radiation may be increased.This can be achieved by moving the lamp closer to the patient or by adjusting the variable resistance.

Probable Mode of action: -

Infrared treatment produces heating effect in the superficial epidermis, thus resulting in Vasodilatation which increases blood circulation in that area. This will lead to more oxygen supply and nutrient supply in that area leading to draining of waste products resulting in the relief pain. The sedative effects on nerve endings lead to reduction in muscle spasm. When heating ismild, the relief of pain is probably due to the sedative effect on the superficial sensory nerve endings. Stronger heating stimulates the superficial nerve endings. It has been suggested that pain may be due to the accumulation of waste products of metabolism in the tissues, and an increased flow of blood through removes waste products of metabolism and so relieves the pain and help in relieving muscle spasm.

CONCLUSION

This study was designed with a sample size of 20 distributed among two groups 10 each based on classical signs and symptoms of *sandhigatavata. Shasthikasha-*

lipindaswedana is one among *ushmaswedana*. No complications of Swedana (atiyoga, ayoga and *mitya yoga*) were observed in this study. Parameters *Sparsha Asahyata*, *Sandhi graham* and *Sandhi Shotha* were found to be having better results in Infra red Radiation Therapy compared to *Shasthikashali Pinda Swedana*, while Parameters *Sandhishoola*, *Sandhi Sphutana*, Range Of Movement (ROM) and Visual Analogue Scale (VAS) were better responded in *Shasthikashali Pinda Swedana* (group A) compared to Infra-red Radiation Therapy (group B). In order to maintain the effects achieved by the procedure we must use *Shamanaoushadies* to sustain it. Though both groups are effective but still Group A is found to be more effective in *Sandhigatavata.*

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