

Clinical Research

A Clinical study of *Matra Vasti* and an ayurvedic indigenous compound drug in the management of *Sandhigatavata* (Osteoarthritis)Mayuri R. Shah, Charmi S. Mehta, V. D. Shukla¹, Alankruta R. Dave, N. N. Bhatt¹Department of Kayachikitsa, ¹Department of Panchkarma and Manasroga, Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurveda University, Jamnagar, Gujarat, India.

Abstract

Sandhigatavata is described under *vatavyadhi* in all ayurvedic classical texts. Osteoarthritis is the most common articular disorder which begins asymptotically in the second and third decades and is extremely common by age 70. Here *Matra Vasti* (therapeutic enema) was given with *Bala taila* as *Vasti* is the best treatment for *vatavyadhies*. It has *vatashamaka* and *rasayana* properties. Indigenous compound drug containing *Guggulu*, *Shallaki*, *Yastimadhu*, *Pippali*, *Guduchi*, *Nirgundi*, *Kupilu* and *Godanti* was given in one group along with *Matra Vasti*. In this study, 33 patients of *Sandhigatavata* completed the treatment. Patients were randomly divided into two groups. Sixteen patients in Group-A (*sarvanga Abhyanga-swedana* + *matravasti*) and 17 patients in Group-B (*sarvanga Abhyanga-swedana*+ *matravasti* + indigenous compound drug). The results of the study indicate that the patients of both the groups obtained highly significant relief in almost all the signs and symptoms of *Sandhigatavata*.

Key words: *Abhyanga*, indigenous compound drug, *Matra Vasti*, osteoarthritis, *Sandhigatavata*, *swedana*, *vatavyadhi*, therapeutic enema.

Introduction

Acharya Charaka has described the disease first separately by the name of '*Sandhigata Anila*' under the chapter of *Vata vyadhi*. He defined it as a disease, with the symptoms of swelling (*Shotha*), which is palpable as air filled bag (*Vata purna driti sparsha*) and pain on flexion and extension of the joints (*akunchana prasarane Vedana*).^[1] *Acharya Sushruta* described pain (*shula*), swelling (*shotha*) and diminution of the movements at the joints involved (*hanti sandhigatah*) as symptoms of *Sandhigatavata*.^[2] Symptoms of *Sandhigatavata* are *vatapurnadrutishopha*, and *akunchana prasarana janya Vedana* described by *Acharya Vagbhatta*.^[3]

In this way, the disease *Sandhigatavata* can be defined as a disease of *sandhi* (joint) with symptoms of *sandhishula* (joint pain), *sandhishotha* (swelling in joints) and *akunchana prasarana pravritti savedana* (pain during movements like flexion and extension of joints) and in the later stage *hanti sandhigatah* (restricted movements of joints). In Allopathic science, the similar condition of joint is explained as osteoarthritis. According to WHO, osteoarthritis is the second commonest musculoskeletal problem in the world

population (30%) after backpain (50%).^[4] Osteoarthritis is the most common joint condition.^[5] It is a degenerative type of arthritis which mainly occurs in old age. It is a chronic degenerative disorder of multifactorial etiology characterized by loss of articular cartilage and periarticular bone remodeling.

In Allopathy science, mainly analgesics, anti inflammatory drugs or surgery are the options for the treatment of osteoarthritis. These do not give satisfactory relief and also cause great adverse effect. Researchers are looking for drugs that would prevent, slow down or reverse joint damage.

The present study is a humble effort in search of cure of the disease *Sandhigatavata*. *Acharya Charaka* has mentioned repeated use of *snehana*, *svedana*, *Vasti* and *mrudu virechana* for the treatment of *Vatavyadhi*.^[6] He has not mentioned the treatment of *Sandhigatavata* separately. *Acharya Sushruta* has described specific treatment for the *Sandhigatavata* first time i.e. *snehana*, *upanaha*, *agnikarma*, *bandhana* and *unmardana*.^[7]

Vasti was selected for the present study as it is shown best for the *vatavyadhies*. Here *Matra Vasti* was given with *balataila*. It has *vatashamaka* and *rasayana* properties. It is widely used in many hospitals, still no research work has been carried out with it in Gujarat Ayurved University. So for the present study, *balataila* was selected. Indigenous compound drug containing *Guggulu*, *Shallaki*, *Yastimadhu*, *Pippali*, *Guduchi*, *Nirgundi*, *Kupilu* and *Godanti* was given in one group along with *Matra Vasti*.

Aims and objectives

1. To assess the effect of *Matra Vasti* with *Abhyanga-swedana*

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in *sandhigata Vata*.

- To assess the effect of indigenous Ayurvedic compound drug in *Sandhigatavata*.

Materials and Methods

Patients between age group of 40 - 70 years having the below mentioned symptoms were randomly selected from O.P.D. and I.P.D. of *Kayachikitsa* department, I.P.G.T. and R.A., G.A.U., Jamnagar:

- Sandhishula* (pain in joints)
- Sandhishotha* (swelling in joints)
- Sandhigraha (Stambha)* (stiffness in joints)
- Akunchana Prasaranayoh Vedana* (pain during flexion and extension of joints)
- Sparsha Asahyata* (tenderness)
- Sandhisphutana* (Crepitus)

Patients having the signs and symptoms of *Sandhigatavata* as described in Ayurvedic texts were selected for the clinical trial. To assess the effect of the therapy objectively, a special scoring was given to all the signs and symptoms of the disease *Sandhigatavata*.

Routine hematological, urine, stool examination, biochemical investigations like fasting blood sugar, lipid profile, serum protein, serum calcium were carried out in all the patients before and after the treatment to evaluate the status of the patient, to exclude any other pathology as well as to see the effect of therapy in these investigations, if any. X-ray examination, joint examination and walking time examination were done in all the patients before and after the treatment to assess the effect of therapy.

Criteria for assessment

To assess the effect of therapy objectively, all the signs and symptoms were given scoring depending upon their severity [Table 1].

Statistical analysis

To analyze the effect of therapy statistically, mean, percentage, S.D., S.E., *t* and *P* values were calculated by using paired '*t*' test.

Method of administration of *Matra Vasti*

Patients were asked to take light meal i.e- neither too *Snigdha* nor too *Ruksha* and not more than three fourth of the usual quantity. Before administration of *Vasti*, *Abhyanga* with *Balataila* was done to the whole body. Thereafter, *Bashpa Swedana* was done.

After these *Purvakarma*, the patient was advised to take left lateral position with left lower extremity straight and right lower extremity flexed on knee and hip joint. The patient was asked to keep his left hand below the head. *Balataila* was applied to anus in small amount. Sixty milliliters of luke warm *Balataila* was taken in enema syringe. Rubber catheter oiled with *Balataila* was attached to enema syringe. After removing the air from enema syringe, rubber catheter was administered into the anus of the patient upto the length of 4-5 inches. The patient was asked to take deep breath while introducing the catheter and drug. The total *taila* was not administered in order to avoid entrance of *vayu* into the *Pakvashaya* which may produce pain.

After the administration of *Vasti*, patient was advised to lie in

Table 1: Signs and symptoms scoring depending upon their severity

Signs and symptoms	Score
<i>Sandhishula</i>	
No pain	-0
Mild pain	1
Moderate pain but no difficulty in walking	2
Slight difficulty in walking due to pain	3
Severe difficulty in walking	4
<i>Sandhishotha</i>	
No swelling	0
Slight swelling	1
Moderate swelling	2
Severe swelling	3
<i>Sandhigraha (Stambha)</i>	
No stiffness	0
Mild stiffness	1
Moderate stiffness	2
Severe difficulty due to stiffness	3
Severe stiffness more than 15 min	4
<i>Akunchana Prasaranayoh Vedana</i>	
No pain	0
Pain without winching of face	1
Pain with winching of face	2
Prevent complete flexion	3
Does not allow passive movement	4
<i>Sparsha Asahyata</i>	
No tenderness	0
Patient says tenderness	1
Winching of face on touch	2
Does not allow to touch the joint	3
<i>Sandhisphutana</i>	
No crepitus	0
Palpable crepitus	1
Audible crepitus	2
<i>Dosha and Dushya Dushti</i>	
Presence of symptoms before treatment	2
Improvement of symptoms after treatment	1
Absence of symptoms after treatment	0
No change in symptoms after treatment	2
X-ray examination	
Normal X-ray	0
Mild changes of O.A.	1
Moderate changes of O.A.	2
Severe changes of O.A.	3
Total effect of therapy	
Complete remission	≥ 75%
Marked improvement	≥ 50%
Moderate improvement	≥ 25%
No improvement	< 25%

supine position and patient's buttocks were gently tapped and legs were raised few times so as to raise the waist. After a while patient was advised to get up from the table and take rest.

Abhyanga -Svedana

Sarvang Abhyanga was done approximately for 30 min with Balataila. After Abhyanga, patient was subjected to Bashpa swedana for approximately 10 min. For this, Dashamula decoction was used.

Indigenous compound drug

The ingredients of drug were Kupilu churna(1 part), Godanti Bhasma (2 parts), Pippali Churna (4 part), Yashtimadhu churna (4 parts), Shallaki (10 parts), Guggulu (10 parts). Then 3 bhavanas of Guduchi, and Nirgundi Svarasa was given to Yastimadha, Pippali and Kupilu churna.

Totally, 35 patients were selected for the study. Among them 33 patients completed the treatment and 2 patients were drop outs. These patients were randomly divided into two groups as below:-

Group-A - 16 patients of this Group were treated with sarvang Abhyanga - swedana alongwith Matra Vasti (60 ml balataila) for three weeks with three days interval at every week.

Group-B - 17 patients of this Group were treated with sarvang Abhyanga - sVedana along with Matra Vasti (60 ml of balataila) for three weeks with three days interval at every week, same as Group-A. Along with this, patients of this Group were also given indigenous compound drug in vati form 1.5 g three times daily for four weeks.

Observations

In the present study, majority of the patients were from the age group of 40-50 years (45.71%). Majority of the patients were females (77.14%), 62.85% patients were housewives, 68.57% patients were belonging to middle class and 88.57% patients were residing in urban area. All the patients were belonging to anoop desha, 77.14% patients were vegetarians, and 91.42% patients were having habit of samashana.

Maximum number of patients had chronicity one-two years (31.42%) followed by two-five years chronicity (25.71%), 65.71% patients were having negative family history, 80% patients were having gradual onset of the disease. In the present study, as Nidana, ati katvadi Rasa Sevana was present in 11.43% patients, ati sheeta Ahara Sevana was present in 2.86% patients, ati Ruksha and ati alpa ahara sevana were present in 2.86% patients [Table 3]. As a risk factor or causative factor [Table 4], 77.14% patients were of female sex; in 14.29% patients, family history was positive. The associated symptoms observed in this study are shown in Table 6.

In this study, all the patients (100%) were having sandhi shula and sandhi sphutana. Akunchana prasaranayoh Vedana and stambha were present in 80% patients, sandhi shotha was present in 71.43% patients and sparsha-asahyata was present in 62.86% patients [Table 5]. The involvement of joints in patients is shown in Table 2.

Basti retention time was observed as minimum of 1 hr, maximum upto 18 hrs with mean of 6 hrs.

Results

Group-A: In this study, 16 patients of Sandhigatavata

Table 2: Involvement of joints wise distribution of 35 patients of Sandhigatavata

Involvement of joints	No. of patients		Total	%
	Group-A	Group-B		
Knee joint	15	19	34	97.14
Hip joint	11	11	22	62.86
Lumbar spine	8	12	20	57.14
Cervical spine	3	2	5	14.29
Interphalangeal joint	2	4	6	17.14
Ankle joint	7	6	13	37.14
Shoulder joint	3	6	9	25.71

Table 3: Nidana wise distribution of 35 patients of Sandhigatavata

Nidana	No. of patients		Total	%
	Group-A	Group-B		
Ati Katvadi Rasa Sevana	2	2	4	11.43
Ati Sheeta Ahara Sevana	1	0	1	2.86
Ati Ruksha Ahara Sevana	0	2	2	5.71
Ati Alpa Ahara Sevana	0	1	1	2.86
Prajagarana	0	1	1	2.86
Vegasandharana	1	5	6	17.14
Dhatu Sankshya	16	19	35	100
Ati Chinta	6	14	20	47.14
Ati Shoka	2	2	4	11.43
Ati Krodha	1	2	3	8.57
Ati Bhaya	1	0	1	2.86

Table 4: Risk factors wise distribution of 35 patients of Sandhigatavata

Risk factors	No. of patients		Total	%
	Group-A	Group-B		
Female	14	13	27	77.14
Trauma	4	3	7	20
Repetitive stress	4	4	8	22.86
Obesity	7	8	15	42.86
Psychological stress	4	13	17	48.57

were treated with Sarvanga Abhyanga - Svedana and Matra Vasti (60 ml Bala taila) for three weeks. The effects are shown in Tables 7-10.

Effect on X-ray Examination: Before treatment, mean score of arthritic changes in X-ray was 1.68, which was reduced to 1.25 after the treatment. The 25.92% relief was noted which was statistically significant ($P < 0.05$) [Table 11].

Before treatment, joint effusion was present in one patient which was absent after the treatment.

Mean score before and after treatment of all the pathological and biochemical investigations which were done for the present study was almost same. All the values were in its normal range before and after the treatment.

In 62.50% patients (10 patients), no recurrence was noted while 37.50% patients (six patients) got recurrence of symptoms in the follow up period i.e. two months after the completion of the therapy [Table 13].

Group-B: In the present study, in this group, 17 patients were treated with *sarvang Abhyanga-swedana* and *Matra Vasti* (60 ml *bala taila*) for three weeks along with indigenous compound drug was given for four weeks. The effect of therapy in group B is shown in Tables 14-19.

Effect on X-ray Examination: The mean score of arthritic changes in X-ray was 1.64 before treatment, which was reduced to 1.28 after the treatment. Here 21.73% relief was obtained which was statistically significant ($P < 0.05$) [Table 18].

Table 5: Cardinal symptoms wise distribution of 35 patients of Sandhigatavata

Cardinal symptoms	No. of patients		Total	%
	Group-A	Group-B		
Sandhi Shula	16	16	32	100
Sandhi Shotha	12	13	25	71.43
Akunchana Prasaranayoh Vedana	13	15	28	80
Sandhi Sphutana	16	19	35	100
Sparsha-Asahyata	11	11	22	62.86
Stambha (Sandhi Graha)	14	14	28	80

In this group, in four patients effusion was present in the joint before treatment which was absent after the treatment. Mean score before and after treatment of all the pathological and biochemical investigations which were done in the present study was almost same. All the values of the investigations were in normal range both the time.

In 52.94% patients (nine patients) no recurrence was noted while 47.05% patients (eight patients) got recurrence of symptoms in the follow up period i.e. two months after the completion of the therapy [Table 20].

Discussion

It is interesting to note that *dhatukshaya* was found in all patients. It can be understood that *sandhivata* is a geriatric

Table 6: Associated symptoms wise distribution of 35 patients of Sandhigatavata

Associated symptoms	No. of patients		Total	%
	Group-A	Group-B		
Vibandha	6	10	16	45.71
Adhmana	4	9	13	37.14
Nidralpata	5	5	10	28.57
Kshudha Mandhya	4	7	11	31.43
Gatrashula	4	3	7	20
Bhrama	1	2	3	8.57

Table 7: Effect of therapy on cardinal symptoms in Group A

Cardinal symptoms	Mean score		% of relief	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Sandhishula	3.31	1.18	64.15	1.31	0.32	6.48	<0.001
Sandhishotha	1.38	0.46	66.66	0.64	0.17	5.19	<0.001
Akunchana Prasaranayoh Vedana	1.92	0.38	80	1.12	0.31	4.92	<0.001
Sandhi Sphutana	1.87	0.26	66.66	0.44	0.11	11.18	<0.001
Sparsha-Asahyata	1.72	0.45	73.68	0.64	0.19	6.52	<0.001
Stambha	2.28	0.64	71.87	1.08	0.28	5.68	<0.001

Table 8: Effect of therapy on associated symptoms in Group A

Associated symptoms	Mean score		% of relief	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Vibandha	2	0	100	-	-	-	-
Adhmana	2	0.5	75	0.57	0.28	5.19	<0.05
Nidralpata	2	0.6	70	0.54	0.24	5.71	<0.01
Kshudha Mandhya	2	0.25	87.50	0.50	0.25	7	<0.01
Gatrashula	2	0.75	62.50	0.50	0.25	5	<0.05
Bhrama	2	1	50	-	-	-	-

Table 9: Effect of therapy on walking and climbing stairs time in Group A

	Mean score		% of Relief	S.D (±)	S.E (±)	t	P
	B.T.	A.T.					
Walking time (30 m)	44.06	34.93	20.70	5.82	8.45	6.26	<0.001
Climbing up and down stairs time (22 stairs)	46.60	38.56	16.28	7.98	1.99	3.57	<0.01

Table 10: Effect of therapy on joint examination in Group A

Joint examination	Mean score		% of relief	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Knee joint flexion							
Left	120.62	126.87	5.18	6.18	1.54	4	< 0.01
Right	120.62	126.25	4.66	6.29	1.57	3.57	<0.01
Hip joint flexion							
Left	136.25	137.5	0.91	5	1.25	1	>0.05
Right	135	136.27	8.38	4.03	1	1.86	>0.05
S.L.R.							
Left	81.56	88.12	8.04	13	3.25	2.01	>0.05
Right	79.68	88.12	10.50	15.02	3.75	2.24	<0.05

Table 11: Effect of therapy on X-ray examination in Group A

X-ray examination	Mean score		% of relief	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Changes of O.A.	1.68	1.25	25.92	0.62	0.15	2.78	<0.05

Table 12: Total effect of therapy in Group A

Total effect of therapy	No. of patients	%
Complete remission	7	43.75
Marked improvement	6	37.50
Moderate improvement	3	18.75
No improvement	0	0

Table 13: Recurrence of symptoms (Follow up – two months) in Group A

Recurrence	No. of patients	%
Yes	6	37.50
No	10	62.50

Table 14: Effect of therapy on cardinal symptoms in Group B

Cardinal symptoms	Mean score		% of relief	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Sandhishula	3.05	1.23	59.61	1.18	0.28	6.34	<0.001
Sandhishotha	1.90	0.63	66.66	0.78	0.23	5.36	<0.001
Akunchan Prasaranayoh Vedana	1.46	0.61	57.89	1.28	0.35	2.38	<0.05
Sandhi Sphutana	1.93	1.31	32.25	0.5	0.12	5	<0.001
Sparsha-Asahyata	1.4	0.6	57.14	0.63	0.2	4	<0.01
Stambha (Sandhigraha)	2.28	0.78	65.62	1.22	0.32	4.58	<0.001

Table 15: Effect of therapy on associated symptoms in Group B

Associated symptoms	Mean score		% of relief	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Vibandha	2	0	100	-	-	-	-
Adhmana	2	0.44	77.77	0.52	0.17	8.85	<0.001
Nidralpata	2	0.75	62.50	0.50	0.25	5.00	<0.05
Kshudha Mandhya	2	0.4	80	0.54	0.24	6.53	<0.01
Gatrashula	2	0.66	66.66	0.57	0.33	4.00	<0.05
Bhrama	2	1	50	-	-	-	-

problem. *Ati chinta* was found in 47.14% patients, *atishoka* found in 11.43% patients, *atikrodha* found in 8.57% patients and *atibhaya* found in 2.86% patients. These manasikanidanas cause *agnivaishamya* and *Vata prakopa*, thus leading to the production of *Sandhigatavata*.

In this series, 77.14% patients were of female sex, 48.57% patients were having psychological stress, and obesity found in 42.86% patients, repetitive stress at the joints found in 22.86% patients, history of trauma was present in 20% patients and hereditary involvement found in 14.29% patients. These factors are mentioned as risk factors for osteoarthritis in the texts and same has been found in the present study. High prevalence of female in osteoarthritis is known. Psychological stress has relation with the severity of the disease. Stress aggravates the pain and other symptoms and may also cause more joint damage. Obesity gives over burden to the joint and causes joint damage. Repetitive stress and trauma directly damages the joint. Heredity plays a role for the production of osteoarthritis especially involvement of interphalangeal joint (heberden's node). Prognosis is good if these risk factors are not present in the patient or if we are able to decrease these risk factors like obesity, repetitive stress etc.

Table 16: Effect of therapy on walking and climbing stairs time in Group B

	Mean score		(% of relief)	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Walking time (30 m)	41.29	31.88	22.79	5.20	1.26	7.44	<0.001
Climbing up and down stairs time (22 stairs)	44.05	36.05	18.15	6.22	1.50	5.29	<0.001

Table 17: Effect of therapy on joint examination in Group B

Joint examination	Mean score		(% of relief)	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Knee joint flexion-left							
Left	123.52	128.82	4.28	6.24	1.51	3.49	<0.01
Right	120	128.23	6.86	7.27	1.76	4.66	<0.001
Hip joint flexion							
Left	131.17	135.29	3.13	8.70	2.11	1.95	>0.05
Right	130	135.29	4.07	8.74	2.12	2.49	<0.05
S.L.R							
Left	82.35	89.41	8.57	11.59	2.81	2.50	<0.05
Right	80.58	88.82	10.21	11.85	2.87	2.86	<0.05

Table 18: Effect of therapy on X-ray examination in Group B

X-ray examination	Mean score		(% of relief)	S.D. (±)	S.E. (±)	t	P
	B.T.	A.T.					
Changes of O.A.	1.64	1.28	21.73	0.49	0.13	2.68	<0.05

Table 19: Total effect of therapy in Group B

Total effect of therapy	No. of patients	%
Complete remission	4	23.52
Marked improvement	8	47.05
Moderate improvement	5	29.41
No improvement	0	0

Table 20: Recurrence of symptoms (follow up – two months) in Group B

Recurrence	No. of patients	%
Yes	8	47.05
No	9	52.94

The treatment modality selected for the present study aims at finding out safe, effective and cost free management of *Sandhigatavata* which can also be applied at OPD level. *Vasti* is very well known as the best treatment for *vatavyadhis*. According to *acharya charaka*, *matra vasti* is always applicable to those emaciated due to overwork, physical exercise, weight lifting, way faring, journey on vehicles and indulgence in women in debilitated person as well as in those afflicted with *Vata* disorders. The *matra vasti* is promotive of strength without any demand of strict regimen of diet, causes easy elimination of *mala* and *mutra*. It performs the function of *brimhana* and cures *vatavyadhi*.^[8]

Indegrious compound drug has properties like *Vedanasthapana*, *shothahara*, *balya*, *rasayan*, *sandhaniya*, *deepana*, *anulomana* etc. Its pharmacological activities include anti inflammatory, analgesic, anti oxidant, immunostimulant etc. By these properties, this drug is beneficial for the shamana of *Sandhigatavata*.

Considering the above aspects, the present study was undertaken and the results supported the hypothesis of the study which are as follows-

Comparative effect of therapies on cardinal symptoms

In Group-A and Group-B, highly significant relief ($P < 0.001$) was found in *sandhishula* with relief of 64.15% and 59.61% respectively. In Group-A, percentage relief is higher than Group-B where only *matra vasti* was given [Tables 7 & 14].

In Group-A and Group-B, highly significant relief was found ($P < 0.001$) in the symptom *sandhishotha* with the relief of 66.66% in both the groups. So the percentage of relief was same in both the groups.

In Group-A, highly significant relief ($P < 0.001$) was found in *akunchana prasaranayoh Vedana* while in Group-B, the relief was significant ($P < 0.05$). In Group-A, 80% relief was achieved while in Group-B, percentage relief was 57.89%. Here, in the symptom of *akunchana prasaranayoh Vedana*, in Group-A higher percentage relief was found than Group-B.

In Group-A and Group-B, highly significant result was found ($P < 0.001$) in the symptom *Sandhi Sphutana* in both the groups with percentage relief 66.66% and 32.25%, respectively. Though highly significant result found in both the groups, percentage relief was greater in Group-A.

In Group-A, highly significant relief ($P < 0.001$) was found in *Sparsha Asahyata*. Also in Group-B, highly significant relief was found at the level of $P < 0.01$. Percentage relief of 73.68% and 57.14% was noted respectively. Here also percentage relief was higher in Group-A.

In Group-A and Group-B, highly significant relief ($P < 0.001$) was found in the symptom *Stambha* with percentage relief 71.87% and 65.62%, respectively. Percentage relief was greater in Group-A.

Effect of therapies on walking and climbing stairs time

Highly significant result was found in both Groups. In Group-A, percentage relief in walking time was 20.70% and in climbing stairs time was 16.28% [Table 9]. In Group-B, percentage relief in walking time was 22.79% and in climbing stairs was 18.15% [Table 16]. In walking time and climbing stairs time, slightly greater relief was found in Group-B in comparison to Group-A. This could be due to the indigenous compound drug.

Effect of therapies on joint examination

In Group-A, relief in knee joint flexion was highly significant. Relief found in hip joint flexion was insignificant. Relief found in S.L.R. (right leg) was significant while S.L.R. (left leg) was insignificant. Percentage relief obtained was knee joint flexion Lf. (5.18%) Rt. (4.66%), hip joint flexion Lt. (0.91%), Rt. (8.38%), S.L.R. Lt (8.04), Rt(10.5%) [Table 10].

In Group-B, relief in knee joint flexion was highly significant. Improvement in S.L.R. was significant. Improvement in hip joint flexion (right leg) was significant and it was insignificant to left hip joint. Percentage relief found was knee joint flexion Lf. (4.28%). Rt. (6.86%), hip joint flexion Lf. (3.13%), Rt. (4.07%) S.L.R. Lf. (8.57%), Rt. (10.21%) [Table 17].

Percentage relief of knee joint flexion left in Group-A was 5.18% and in Group-B was 4.28%. Here better relief was in Group-A. On Rt. knee joint, percentage relief was 4.66% in Group-A and 6.86% in Group-B. Here more relief was in Group-B.

Percentage relief of hip joint flexion left in Group-A was 0.91% and in Group-B was 3.13%. Here higher relief was in Group-B. On right hip joint, percentage relief was 8.38% in Group-A and 4.07% in Group-B. Here more relief was obtained in Group-A.

Percentage relief in S.L.R. left in Group-A was 8.04% and in Group-B was 8.57%. Almost same relief was found in both the Groups. On right side, percentage relief was 10.50% in Group-A and 10.21% in Group-B. Same relief was found in both the groups.

Effect of therapies on X-ray examination

In both the groups, significant relief was found ($P < 0.05$). Percentage relief in Group-A was 25.92% [Table 11] and in Group-B, it was 21.73% [Table 18]. Slightly greater relief was found in Group-A in comparison to Group-B in X-ray examination.

Effect of therapies on joint effusion (X-ray examination)

In Group-A, in one patient, knee joint effusion was present in X-ray examination before treatment and it was absent after treatment. In Group-B, in four patients, knee joint effusion was present before treatment. Among them, in three patients, it was

absent after treatment in X-ray examination. Here, both the groups obtained good result in joint effusion.

Though joint effusion is not a characteristic feature of osteoarthritis, the pathological condition in knee joint associated with osteoarthritis can also be treated successfully by this modality.

Probable mode of action

Vasti- Vasti is the best treatment for Vata as said by Acharya Charaka "Vastihni Vataharanam". Vasti drug first reaches to the *Pakvashaya* (large intestine). *Pakvashaya* is the chief site of *Vatadosha*. Thus, by its action on the chief site, Vasti gets control on Vata all over the body. *Pakvashaya* is the site of *Purishadharakala*. Commentator Dalhana has said *Purishadhara* and *Asthidhara kala* are one and same.^[9] Vasti drugs directly acts on *Purishadharakala* so we can take its direct action on *Asthidharakala* also. *Sushruta* has mentioned 6th Vasti nourishes *Mamsa Dhatu*, 7th Vasti nourishes *Meda Dhatu*, 8th Vasti nourishes *Asthi Dhatu* and 9th Vasti nourishes *Majja Dhatu*.^[10] Thus, through Vasti, we achieve *Vata Dosha Shamana* and *Snehana* of *Asthi Dhatu*. So we achieve the *Shamana* of *Sandhigatavata* by breaking the *Samprapti*. According to modern medical science, as per *Vasti /Enema* concerned, in trans rectal route, the rectum has a rich blood and lymph supply and drug can cross the rectal mucosa like other lipid membrane. Thus by entering in general circulation, Vasti drugs acts on whole the body.

Vasti may act through the nervous system or through the enteric receptors. It may increase the secretion of local enzyme or neurotransmitters. Vasti influences the normal bacterial flora, thus it increases the endogenous synthesis of vitamin B₁₂, vitamin K etc.

Bala used in *matravasti* gives "Bala" to the body. It has *Vatasansaman* and *Rasayana* properties. So it is very good in *Vatavyadhies* i.e. degenerative disorders. Its pharmacological activities include rejuvenative, anti inflammatory, analgesic etc. *Balataila* is good in all types of *Vatavyadhi*, *Raktapitta*, *Yoniroga*, *Talushosha*, etc.^[11]

In osteoarthritis, there is disruption of glue which binds the cells of the cartilage, so cartilage damage takes place. *Taila* by its qualities like *tikshna*, *sukhma* penetrate the cartilage and by its *Snigdha*, *Guru* qualities provides glue which binds the cartilage cells. This action of *taila* is considered as "sandhaniya".

Abhyanga (massage) - *Abhyanga* directly acts on muscles and makes them strong. The root of *Mamsavaha Srotas* is *Snayu* (ligaments), *Tvacha* (skin) and *Raktavahini* (blood vessels). So here, *Abhyanga* is done over *Tvacha* and *Snayu* and also it involves *Raktavahini*. So here, direct benefit is achieved at *Mamsavaha Srotas*. *Abhyanga* nourishes deeper *Dhatu*s also. Here, one thing we can say that *Abhyanga* makes the muscles strong and thus get the stable joint.

Swedana (fomentation): *Swedana* is *Sandhichestakar* (improves the movements of joints), *Srotoshuddhikar* (clears up the micro channels), *Agni Deepaka*, *Kaphavatanirodhan* (antagonist of *Kapha*). It decreases *Sthambha* (stiffness). Heat administration by *Swedana* may produce hypno analgesic effect by diverted stimuli. In *Sandhigatavata*, *Sanga* type of *Srotodushti* is present *Swedana*, by doing *Srotoshuddhi*, this *Sanga* is released.

Indigenous compound drug: It has properties like *Vedamasthapana* (analgesic), *shothahara* (anti-inflammatory), *balya*, *rasayan*, *sandhaniya*, *deepana*, *anulomana* etc. Its pharmacological activities include anti inflammatory, analgesic, anti oxidant, immunostimulant etc. By these properties, this drug is beneficial for the *shamana* of *Sandhigatavata*.

Conclusion

Complete remission was found in 43.75% patients in Group-A [Table 12] and 23.52% patients in Group-B [Table 19]. Marked improvement was found in 37.50% patient in Group-A while 47.05% in Group-B. Moderate improvement was found in 18.75% patients in Group-A and 29.41% patients in Group-B. In Group-A, more number of patients got complete remission in comparison to Group-B. Otherwise, almost equal result is obtained in both the groups.

With these results, it can be said that sarvang *Abhyanga-swedana* and *Matra Vasti* serve all the needs which are required for the *shamana* of *Sandhigatavata*. Along with present therapy, addition of *sthaulyahara* treatment in *sthula* patients and long duration of therapy may provide better relief. Addition of exercise may help in improving joint function.

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हिन्दी सारांश

मात्रावस्ति तथा एक आयुर्वेदीय योग का सन्धिगत वात पर चिकित्सिय अध्ययन

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सन्धिगत वात का वर्णन सभी संहिता ग्रंथों में वात व्याधि के अंतर्गत किया गया है। इसकी तुलना आधुनिक विज्ञान में ओस्टियो अर्थोइटिस के साथ की जा सकती है। आधुनिक विज्ञान में बताई गयी दवाईयाँ सिर्फ क्षणिक लाभ करती हैं, तथा शस्त्र क्रिया से भी पूर्णतः लाभ नहीं मिलता। यह रोग वृद्धावस्था में होने के कारण एवं मध्यममार्गगत तथा वातप्रकोपक के कारण कष्टसाध्य है। वस्ति को वातव्याधि के लिए श्रेष्ठ चिकित्सा कहा गया है। अतः इस अध्ययन में बला तैल द्वारा मात्रा वस्ति का प्रयोग किया गया है। इन्डिजिनस कंपाउंड ड्रग के अंतर्गत कुछ विशिष्ट औषधियाँ जैसे - गुगुलु, शल्लकी, यष्टीमधु, पिप्पली, गुडुची, कुपीलू तथा गोदन्ती का प्रयोग एक वर्ग के आतुरों में मात्रावस्ति के साथ किया गया। वर्तमान में कुल ३५ आतुरों को पंजिकृत किया गया, उन्हें सामान्य वितरण प्रणाली से दो वर्गों में विभाजित किया गया। वर्ग अ में १६ आतुरों को सर्वांग अभ्यंग स्वेदन तथा बला तैल की मात्रावस्ति (६० मिली०) तीन सप्ताह तक दी गई। वर्ग ब में १७ आतुरों को सर्वांग अभ्यंग स्वेदन तथा बला तैल की मात्रावस्ति (६० मिली०) एवं इन्डिजिनस कंपाउंड ड्रग को १.५ ग्राम वटी के रूप में दिन में ३ बार दिया गया। इस औषधि को चार सप्ताह तक दिया गया। दोनों वर्गों में आतुरों पर औषध के चिकित्सात्मक प्रभाव का अध्ययन विशेष रूप से निर्मित गवेषणा प्रपत्र के आधार पर किया गया। पाए गए परिणामों से यह साबित हुआ कि वर्ग अ से प्राप्त परिणाम वर्ग ब की तुलना में अच्छे आये। वर्ग अ में ४३.७५% आतुरों को तथा वर्ग ब में २३.५२% आतुरों को पूर्णतः लाभ प्राप्त हुआ। वर्ग अ में ३७.५०% आतुरों को तथा वर्ग ब में ४७.०५% आतुरों को उत्तम लाभ प्राप्त हुआ। इसके द्वारा यह निष्कर्ष निकाला जा सकता है कि वर्ग अ में अधिक आतुरों को पूर्णतः लाभ प्राप्त हुआ। दोनों ही वर्गों के परिणाम अत्यन्त लाभदायी हैं।