



A CLINICAL RANDOMIZED OPEN STUDY ON THE MANAGEMENT OF SANDHIGATAVATA W.S.R. TO OSTEOARTHRITIS BY PATOLA (TRICOSANTHUS DIOCA) KSHIR BASTI

Gulhane Harshad¹, Bhole Sunanda², Kabra Prakash³, Gulhane Jayant⁴, Yashwant Wankhade⁵

¹Asso. Professor, Dept. of Kayachikitsa, MUPS Ayurved College, Hospital & Research Centre, Risod

²MD Kayachikitsa, Consultant at Shatayu Clinic & Panchakarma center, Amravati

³Professor & HOD Dept. of Kyachikitsa, Govt. Ayurved College, Nagpur

⁴Associate Professor Dept. Of Kyachikitsa, Govt. Ayurved College, Nagpur

⁵Asso. Professor, Dept. of Swasthavritta, MUPS, Ayurved College, Hospital & Research Centre, Risod

Corresponding Author: harryayu007@gmail.com

<https://doi.org/10.46607/iamj0809032021>

(Published online: March 2021)

Open Access

© International Ayurvedic Medical Journal, India 2021

Article Received: 24/02/2021 - Peer Reviewed: 02/03/2021 - Accepted for Publication: 06/03/2021



ABSTRACT

Osteoarthritis is the leading causes of arthritis in adult population. The word “Osteoarthritis” correlate as “*Sandhigataavata*” which is describe under ‘*Vatvyadhi*’ in Ayurveda. Osteoarthritis (OA) may be perhaps the oldest of all known diseases. In this present era there is no definite cure for OA. *Ayurvedic* management of *SandhigataVata*, include *BahyaSnehan* (external oliation), *Swedana* (fomentation), *Abhyantara TiktaSnehapana* (ingestion of medicated ghee), *Basti* (medicated enema) treatment and *GugguluPrayoga*(drug containing *comiferamukul*). **Aim:** To assess the efficacy of ‘*Patola* (Tricosanthusdioca) *Kshir Basti*’ in the patients of ‘*Sandhigataavata*’. To study the efficacy of ‘*Guduchi* (Tinusporecordifolia) *Kshir Basti*’ in the patients of ‘*Sandhigataavata*’. **Materials and Methods:** In the present study 60 patients of *Sandhigataavata* were studied. These patients were classified randomly into two groups termed as Trial Group and Control Group. Diagnosis of *Sandhigataavata* was done on the basis of classical signs and symptoms mentioned in *Ayurvedic* text, as well as the diagnostic criteria for osteoarthritis of knee **Result:** Significant results ($P < 0.05$) were found in all the cardinal symptoms –

Pain (*Sandhiruja*), Swelling (*Shotha*), tenderness, crepitus and pain on extension and flexion. Haematological findings showed significant result in sr. calcium, Haemoglobin percentage and ESR (Erythrocyte sedimentation rate) changes. **Conclusion:** At 5% level tabulated Chi Square suggested that both of the groups are same.

Keywords: *Sandhigatavata*, Osteoarthritis, *PatolKshir Basti*, *Guduchi* (*Tinusporacordifolia*) *kshirbasti*

INTRODUCTION

Osteoarthritis (OA) is the most common type of arthritis. Its high prevalence, especially in the elderly, and the high rate of disability related to disease make it a leading cause of disability in the elderly.^[1] Osteoarthritis (OA) is the second most common rheumatologic problem in India and has a prevalence rate of 22-39%.^[2] OA is joint failure, a disease in which all structures of the joint have undergone pathologic change, often in concert. The pathological changes of disease is hyaline articular cartilage loss, present in a focal and, initially, nonuniform manner.^[3] Several factors heighten the risk of incident OA, including age, gender, joint injury, and obesity. Although the clinical manifestations of OA can begin as early as the fourth and fifth decades of life, the incidence of OA continues to increase with each decade of aging. Moreover, women in their 50s, 60s, and 70s have a greater prevalence of OA in the hands and knees than do men.^[4] Although OA itself is not a life-threatening disease, but it significantly alters quality of life and loss of mobility causing disability. In those <55 years, the joint distribution of OA in men and women is similar^[5]. In *Ayurveda*, the disease *SandhigataVata* resembles with OA, which is described under *Vatavyadhi*. Since Osteoarthritis is a most commonly disturbing joint disease those with more severe OA, especially of knee or hip a spectrum of non-pharmacologic measures supplemented by an analgesic and or NSAID is appropriate.^[6] However, concern over the use of NSAIDs in OA has grown in recent years because of the adverse effect of these agent, especially those related to gastrointestinal tract.^[7] Patient's life is crippled. Therefore, people of the present era are looking forward towards *Ayurveda* for relief.

The management of *Sandhigatavata* is described in various *Ayurvedic* text, *Charaka* has stated the management of '*AsthipradoshajaVyadhi*' (Disease related

to skeletal system) in which use of *Kshira* (Milk) processed by *Tikta Rasa* in the form of *Basti* (medicated enema) is advised.^[8] *Tikta Rasa* has properties of *Dipana-Pachana* (Increase digestive power), *Stanya-Shodhana*, *Lekhana*, *kleda – Meda-Vasa Upashoshanam*.^[9] the drugs having *Tikta Rasa* are responsible to increase *Vata*, except *Guduchi* (*Tinusporacordifolia*) and *Patola* (*Tricosanthusdioca*).^[10] Because of all these properties *PatolaPatra* (Leaves of *Tricosanthusdioca*) was selected and *Kshira* was processed with *Patola* (*Tricosanthusdioca*), this *Patola* (*Tricosanthusdioca*) *Kshira* was used in the form of *Kshira Basti* in '*AsthipradoshajaVyadhi*' like *Sandhigatavata*. It is probable that *Tikta Rasa* along with milk by virtue of its properties such as *Vishad*, *Parush*, *Khara*, and *Ruksha* acts on *Meda Dhatu*, which is converted into *Parthiva Dravya*, so that *Asthi* is formed. To achieve the maximum effect, drug is administered in the form of *Basti* which directly acts on *Purishdharakala*, also to be considered as *Asthidharakala*.^[11] *Basti* stands for main management of *vata* and *Sandhigatavata* is one of the *Vatavyadhi*.^[12] Thus study entitled "Clinical Randomized Open Study On the Management of *Sandhigatavata* by *Patola* (*Tricosanthusdioca*) *Kshira Basti*".

Materials and Method

A total of 60 subjects with OA knees were recruited for the study all the patients of *SandhigataVata* were selected irrespective of Sex, Religion and Economical status. However there were two groups one having 28 patients (Trial group) which were given *Patola* (*Tricosanthusdioca*) *Kshir Basti* and another comparative group having 26 patients (Control group) were given *Guduchi* (*Tinusporacordifolia*) *kshir Basti* during the treatment course. Among which 60 subjects (34 female and 26 male) completed the whole course and 6 dropped out. The study was approved by the Institutional Ethical Committee (IEC) and Institutional Eth-

ics Committee (IEC) (Ref No.: IEC/GACN/PGD/200/2013). Signed informed consent was obtained from all the participants.

Inclusion Criteria: Age group primarily above 40 years. Patients of both sexes will be considered Established cases mainly of knee joint by clinical and radiological findings

Exclusion Criteria: Secondary OA due to rheumatoid arthritis, gout, septic arthritis, tuberculosis, tumor, trauma, or hemophilia, Major medical or psychiatric disorders. Congenital bone and joint deformity. Ster-

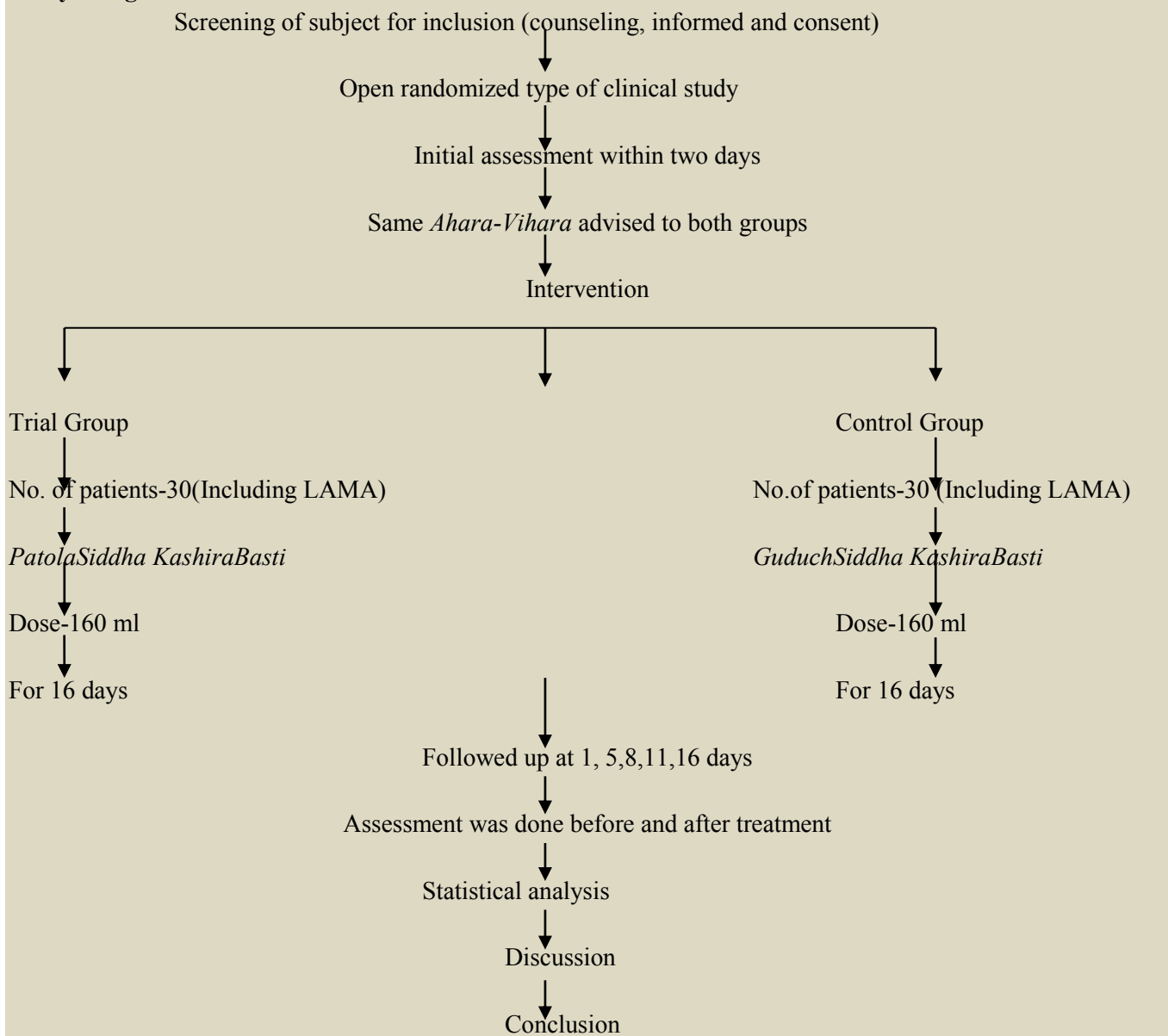
oid dependent patients for relief. Patients not willing for trial. Patients with ano-rectal pathologies like fissures, piles, fistula etc.

Washout Period

There was washout period of 2 weeks only if the patients give previous history of taking Allopathic/Ayurvedic/Any medicine (Any oral or local application was withdrawn gradually within a week time and subject had not given any medicine for next week and then he/she was registered for the trial.

Design

Study Design



Trial Group:

30 patients fulfilling the criteria of diagnosis were selected randomly for the study in this group. Patients were selected according to criteria of diagnosis. Those patients who were willing to get the treatment from I.P.D of allied hospital were admitted prior to start the treatment. Patients were under observation for about two days. During these two days of observation vital data, chief complaints and history of patients were recorded. All the clinical examinations as mentioned in case proforma were carried out. Routine Blood and other related investigations were carried out to rule out other pathologies. Patients were sent for X-ray examination of the joint to confirm the diagnosis and to exclude other pathology. Early in the morning patients were sent for *Abhyanga (oil massage)* and *Svedana (hot fomentation)* in *Panchakarma* Department. Then patients were advised to eat light Diet. *Patola (Tricosanthusdioca) Kshir Basti* was prepared as mentioned in *Sharangdhar Samhita*.^[13] After that prepared *basti* was given in the quantity of 160 ml to the patient. Procedure of giving *Basti* was done according to *Charaka* as mentioned in *Siddhi Sthan*.^[14] The duration of the treatment was 16 days.

Control group: In this group 26 patient were given *Guduchi (Tinusporacordifolia) Kshir Basti* as mentioned in trial group.

Procedure of Basti Therapy:

1) Preparation of The Patients (Purva karma):

The patients were mainly subjected for *Abhyanga*

and *Nadi Sveda* at the sight of *Kati Pradesh*, prior to the administration of *Basti*.

Abhyanga: The *Abhyang* was done by lukewarm *Tila tail* for about 15 to 20 minutes.

Nadi Sveda: After *Snehana* the patients was subjected for *Sveda* by using *NadiSvedana* (by using *Dashmula* and *Nirgundikwatha*) for about 15 to 20 minutes.

Procedure of Kshir Basti:

First *TilaTalia* was applied to *Kati, ShroniPradesh (Lumber region)* of the patient and massage was done. Then *Nadi-Sveda* was given to the massaged part for about 10 minutes. Left-lateral position was given to the patients and his left knee Joint was flexed up to chest as possible to the patient^[23] 50 ml prepared *Kshir* was taken into plastic syringe which was attached to the simple rubber catheter having no.10. *Kshira* was pushed gently with the same force as mentioned in science. After that, patient was instructed to take rest, at least for 15 minutes.

Pashchat Karma (After procedure):

After giving *Basti*, instruction was given to patients to lie down on abdomen for 20-25 minute. Patients were asked to hold *Basti Dravya* for possible maximum period. Hot water bath was advised after *Basti Pratyagaman (time period between basti given and it expel from anal root)*. Patients were suggested to avoided heavy work, running, day sleep and exercise. Whole procedure was followed to all patients in both groups.

Preparation of Kshir Basti:

Table 1: Table Showing Management of Groups

Control group-Guduchi (Tinusporacordifolia) Kshir Basti	Trial Group-Patola (Tricosanthusdioca) Kshir Basti
1. Kshir – 160 ml	1. Kshir–160ml
2. Guduchi (Tinusporacordifolia)Kand in Bharad Form – 20 gm	2. Patola (Tricosanthusdioca) Patra in Bharad Form–20 gm
3. Water –640ml	3. Water – 640 ml
4. Saidhav and Shatapushakalk each of 2 gms was added.	4. Saidhav and Shatapushakalk each of 2 gms was added
5. Ghrita 10 ml	5. Ghrita 10 ml

For *Guduchi (Tinusporacordifolia) Kshir Basti*, 20 gms of crushed *Guduchi (Tinusporacordifolia)Kand* was taken in a pot, then 160 ml of milk was added

with 640ml of water, boiled until the half of the liquid was left and then 2 gms of *Saidhav*, 2 gms *ShatapushaKalka* and 10 ml of caw Ghee was added. In the

same way Patola (Tricosanthusdioca) Kshir Basti was prepared. Duration of treatment was of 16 days. Basti was administered in the morning at about 9 to 10 A.M. after light diet, once a day.

Criteria of Assessment:

Subjective criteria:^[15] Visual analogue scale (VAS) was used for assessing pain

1) Pain (Shoola)

No Pain	- 0
Mild Pain	- 1
Moderate pain but no difficulty in walking	- 2
Moderate pain and slight difficulty in walking	- 3
Severe pain which prevents walking	-4

Pain on Extension and Flexion (Passive movement)

a) No pain	-0
b) Pain without wincing of face	-1
c) Pain with wincing of face	- 2
d) Prevents complete flexion	- 3
e) Doesn't allow passive movement	-4

3) Stiffness (Graha)

No stiffness	- 0
Mild stiffness	- 1
Moderate stiffness	- 2
Severe stiffness (more than 10 minutes)	- 3

4) Shotha (swelling) on Joint

No Shotha	- 0
Slight Shotha	- 1
Moderate Shotha	- 2
Severe Shotha	- 3

5) Crepitus

No	- 0
Palpable Crepitus	- 1
Audible crepitus	- 2

6) Tenderness at Joint ("Ritchie Articular Index.")

No	- 0
Patients says tenderness	- 1

Wincing of face	- 2
Wincing of face and patient withdraws the affected part	- 3
Not allow to touch the joint	- 4

7) Nature of Pain

No pain	- 0
Only in morning	- 1
In morning and evening	- 2
Pain present at whole day	- 3

8) Roentological Gradation

Normal Roentogram	- 0
Marginal osteophytes/sclerosis/reduced joint space	-1
Joint space markedly reduced, subchondral sclerosis osteophytes	-2
Bony cyst formation, osteoporosis and joint deformity	- 3

9) Angle of flexion of joint before and after treatment done.

10) Body Mass Index (B.M.I) was assessed.

$$B.M.I. = \frac{\text{Weight in kg}}{\text{Height in m}^2}$$

11) Weight

Objective parameters

Radiological findings

The Kellgren-Lawrence index was used to assess the changes in radiological finding.

- Grade 1 - Doubtful narrowing of joint space and possible osteophytic lipping
- Grade 2 - Definite osteophytes, definite narrowing of joint space
- Grade 3 - Moderate multiple osteophytes, definite narrowing of joints space, some sclerosis and possible deformity of bone contour
- Grade 4 - Large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone contour

Overall effect of therapy

• No improvement:	• 0-25%,
• Mild improvement:	• >25-50%,
• Moderate improvement:	• >50-75%,
• Marked improvement:	• >75-<100%
• Complete remission:	• 100%.

Observations

Table 2: Table Showing Body Mass Index of 60 patients of *Sandhigatavata*

Sr. no.	Range of B.M. I	Trial Group		Control Group		Total no. of patients.	%
		No. of patients.	%	No. of patients.	%		
1	<18.5(Underweight)	00	00	00	00	00	00
2	22-24.9(Normal)	12	40%	09	30%	21	35%
3	25-30(Overweight)	17	56.67%	20	66.67%	37	61.67%
4	>30Obese	01	3.33%	01	3.33%	02	3.33%

B.M.I = Weight in (Kg) /Height in meter ²Table-1 showed that most of the patients studied were overweight (61.67% patients). While gross obese person having B.M.I above 30 were 3.33% patients. No one patient was recorded in category of underweight. Patients having B.M.I between 22- 24.9 were also observed (35 %). In this study, none of the patients of *Sandhigatavata* were categorized in ‘complete remission and markedly relieved’. However, 90% patients

from Trial Group were relieved and 3.33% patients were unchanged after completing the treatment. In case of Control group 80% patients were relieved and 6.66% patients were unchanged. Comparison between two groups was statistically evaluated by Chi-square test using Yates correction as depicted in Table-03 because condition of almost five units in each cell of criteria of effect of therapy was not fulfilled. Table-03

Table 3: Table Showing Comparison Between Two Group WRT to Total Effect of Therapy by Chi Square Test

S. N.	Total Effect	Treated Group		Control Group		Total No. of Patients
			No. of Patients		No. of Patients	
1	Relieved	Observed-	27.0	Observed-	24.0	51
		Expected-	26.44	Expected-	26.44	
		Chi Sq. of Cell-	0.000136	Chi Sq. of Cell-	0.1423	
2	Unchanged	Observed-	01	Observed-	02	03
		Expected-	1.44	Expected-	1.44	
		Chi Sq. of Cell-	0.0025	Chi Sq. of Cell-	0.0025	
Total No. of Patients			28		26	54

$$\begin{aligned} \text{Total Chi Square} &= \\ 0.000136+0.0025+0.1423+0.0025 & \\ &= 0.1474 \end{aligned}$$

At 5% level tabulated Chi Square at said degree of freedom [(C-1) (R-1)]=1 is 3.841 which is much more than calculated Chi Square value, hence the result is insignificant at 5% level. To calculate Chi Square following formula was used. $\left[\frac{|O-E| - 1/2}{O-E} \right]^2 / O-E$ Yate’s correction was used. This test suggested that both of the groups are same.

DISCUSSION

Sandhigatavata(Osteoarthritis) is described in all *Samhita* and *Sangraha Grantha*(Ayurvedic literature) as a separate clinical entity under the heading of

VataVyadhi. It is included in 80 types of *Nanatmaja-VatikaVikaraby Charakaby* mentioning the name of *Gulphavata*. While commenting on “*Gulphavata*” *Chakrapani* explains the meaning of “*GulphaVata*” as *Sandhigatavata* or *Khudvata*^[16] The main symptoms and signs of *Sandhigatavata* (Osteoarthritis) include pain on flexion and extension of the affected joint, swelling, stiffness, crepitus, and tenderness. The swelling described by Charaka is of special type which is felt like a bag filled with air (*VataPurnaDriti Sparsha*)^[17]. *Sandhigatavata* is similar to the osteoarthritis with respect to the symptom. Not only had that, but degenerative changes, termed as *Kshayajanya* vitiation of *Vayu* is also similar. The most commonly affected parts are knee, hip, sacroiliac, ankle, distal

interphalangeal, metatarso phalangeal joints, which are weight bearing parts of the body. Osteoarthritis can also occur as a complication of some other disease. Modern medicine prescribes nonsteroidal anti-inflammatory medicines and analgesics drugs most of the times.^[18]Sometimes oral steroids or intra-articular steroids are needed. These medicines have dreaded side effects.^[19] Sometimes these medicines also fail to give the relief in symptoms. Further surgical innervations are needed to give the relief in crippled life which disturbs the economic health of the patients that too in the middle or old age. Therefore, patients suffering from *Sandhigatavata* have the ray of hope from the *Ayurveda*. *Ayurveda* has the successful answers up to certain extent. Taking foresaid facts into consideration thought was in mind to evaluate the effect of some of the concepts of treatment in *Sandhigatavata* in which *Dushti*(imbalance) of *Vata*, *Meda*, *Asthi* and *Majja* are main factors which are generally seen among the patients of *Sandhigatavata*. It is manifested because of two main causes, termed as causes responsible for *Dhatukshay* (Degenerative) and *Marga- Avarodha* (Obstructive). Treatment of *Sandhigatavata* is same as that of the treatment of *Asthidushti*. *Charaka* has advised to follow *Panchakarma*, treatment. *KshiraBasti* processed with the help of *TiktaRasa*, has also been advised.^[20]*Tikta Rasa* is included in different causes

responsible for the vitiation of *Vayu*. *Vagbhat* in *AsthangHridaya* has mentioned a characteristic of *Tikta Rasa*. He is of the opinion that use of *Tikta Rasa* in general might cause vitiation of *Vayu*. But, *Arunadatta* is of the opinion that use of *Kshira Basti* processed with *TiktaRasa* does not aggravate *Vayu* because of use of *Sneha*(Lubricant) along with *Tikta*^[21]Therefore use of *Tikta Rasa* along with one of the *Sneha* by oral route or by anal route in the form of *Basti* is advised. In the same manner *Kshira* processed with *Tikta Rasa* is also advised by *Charaka*^[22]Keeping these facts in mind, people in the society are looking forward to *Ayurveda* to design effective management of *Sandhigatavata*. Considering these views, it was thought to evaluate effect of *Patola (Tricosanthusdioca)Kshir Basti* on *Sandhigatavata*.

Effect of Therapy on General Symptom Score: It has been explained in the criteria of assessment that the effect of therapy will be evaluated on clinical features by adopting score system which is described in the criteria of assessment. These symptoms were pain, pain on extension and flexion, Stiffness, *Shotha*, Crep-itus, Tenderness, and Nature of pain. Each of these symptoms was assessed with respect to the symptom for general symptom score before the start of treatment as well as after the completion of treatment.

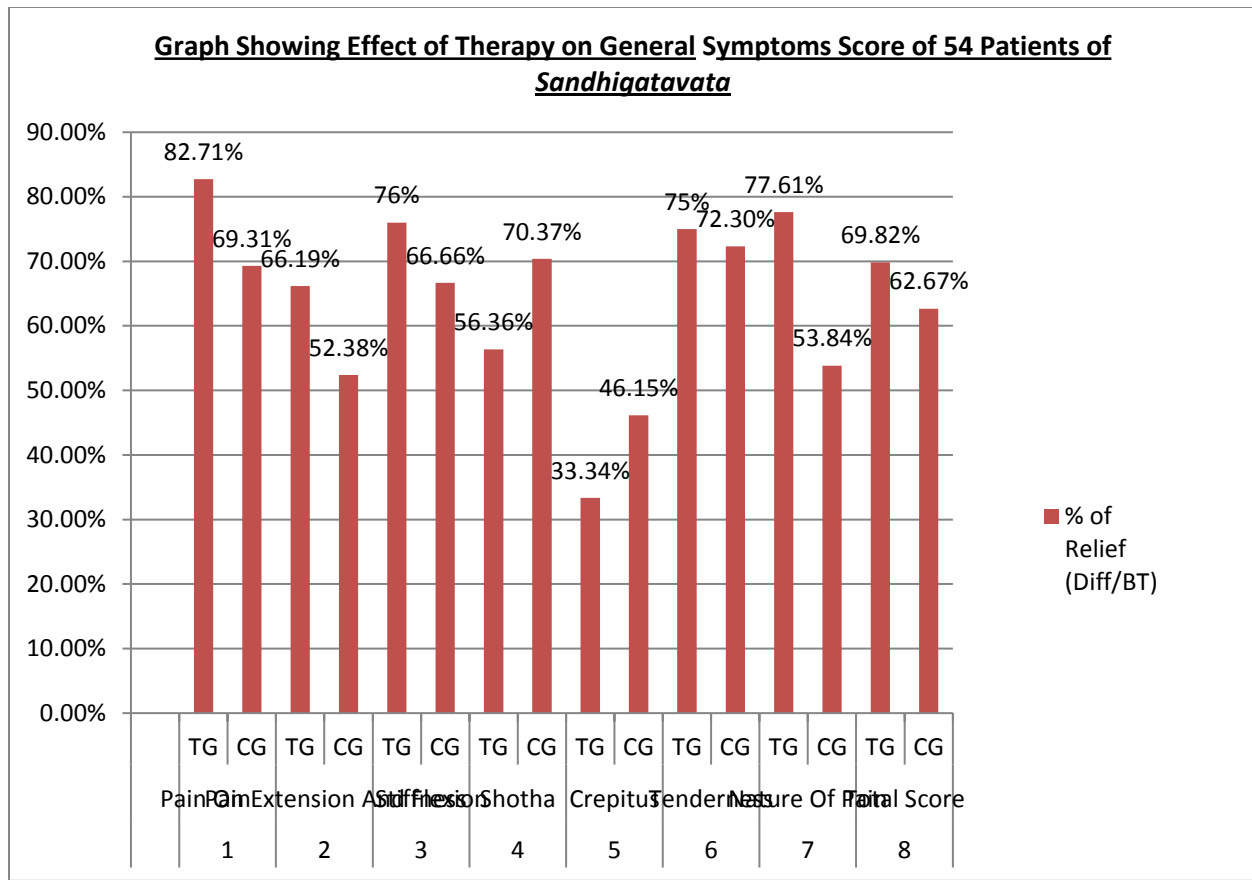


Figure 1:

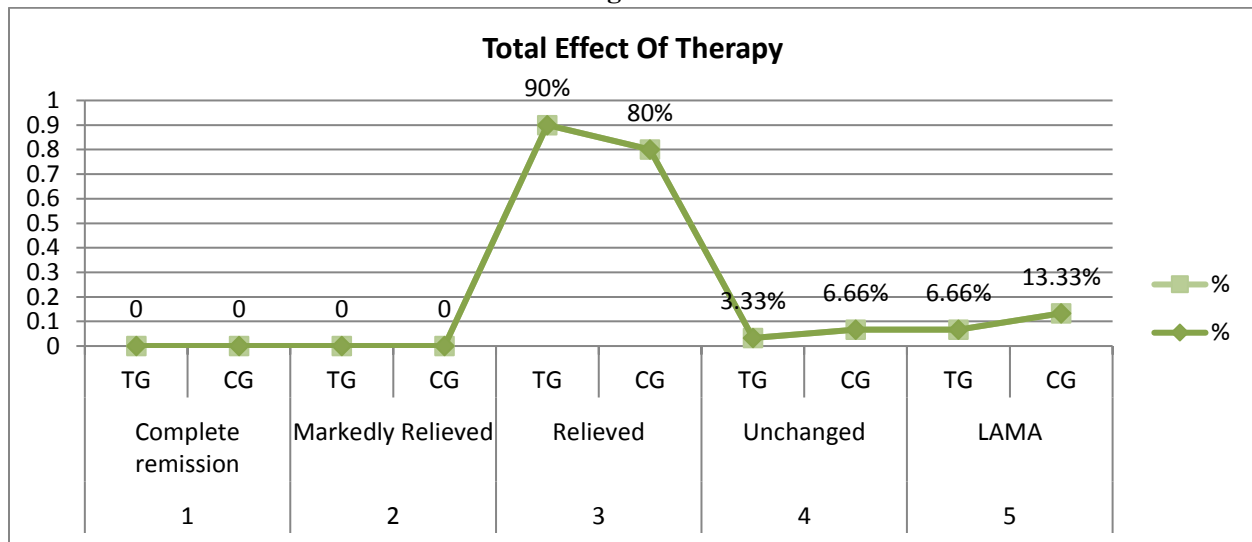
Total Effect of Therapy: In this study, none of the patients of *Sandhigatavata* were categorised in ‘complete remission and markedly relieved’. However, 90% patients from Trial Group were relieved and 3.33% patients were unchanged after completing the treatment. In case of Control group 80% patients were relieved and 6.66% patients were unchanged. Comparison between two groups was statistically evaluated by Chi-square test using Yates correction because condition of almost five units in each cell of criteria of effect of therapy was not fulfilled.

$$\begin{aligned} \text{Total Chi Square} &= \\ 0.000136+0.0025+0.1423+0.0025 & \\ &= 0.1474 \end{aligned}$$

At 5% level tabulated Chi Square at said degree of freedom [(C-1)(R-1)]=1 is 3.841 which is much more than calculated Chi Square value, hence the result are insignificant at 5% level. To calculate Chi Square following formula was used.

[|O-E|-1/2]²/O-E Yates’s correction was used. This test suggested that both of the groups are same. *Kshir Basti* in the management of *Sandhigatavata* is one of the useful, cost effective, treatment having less side effects. So, drugs having *Tikta Rasalike Patola (Tricosanthusdioca)* and *Guduchi (Tinusporacordifolia)* were used in this study in the form of *Kshir Basti* for the patients of *Sandhigatavata* having *Sthula* Constitution. *Tikta Rasa* present in *Basti* might be beneficial in *Meda Pachana*. By virtue of *Ruksha, Khara, Parushaguna* of *Tikta Rasa* might be helpful in forming the *Asthi Dhatu* from *Sthula* part of *Meda Dhatu*. *Sandhigatavata* as described earlier is the major problem of the today’s era. It is very important to manage such patients with the help of *Ayurveda*. The course of *Kshir Basti* processed with *Tikta Rasa* should be used for more prolonged time in future.

Figure 2



Probable mode of action of Basti: *Basti Chikitsa* is the prime treatment modality of *Ayurveda*. It is also considered as *ArdhaChikitsa* (half treatment). Though *Basti* is administered in the *pakvashaya*, it has action throughout the body. According to *Shushruta*, a properly given *Basti*, remains in the *pakvashaya*, *shroni* and below *nabhi* (umbilicus) and through the *srotases* the *Virya* (potency) of *Basti Dravya* spread to the entire body. *Basti* is having two action, expelling the *Doshas* and nourishing the body. First, potency of the *Basti* drugs get absorbed to have its systemic action. Its second major action is related with the facilitation of excretion of morbid substances responsible for the disease process into the colon, from where they are evacuated^[24].

CONCLUSION

Osteoarthritis is a disease in which degeneration of joint cartilage and adjacent bone that can cause joint pain and stiffness. This is the most common of all joint disorders affects men and women. The prevalence of this joint disease is estimated to be 1-2% world-wide. Since Osteoarthritis is a most commonly disturbing joint disease a number of analgesics and anti-inflammatory drugs are prescribed in it. *Kshir Basti* in the management of *Sandhigatavata* is one of the useful, cost effective, treatment having less side effects.

REFERENCES

1. Longo DL, Fauci AS, Kasper DL, Jameson JL, Hauser SL, Loscalzo J. Harrison's Principle of Internal Medicine. 17th Ed New York, NY: McGraw Hill; 2010, part 14, section 3, chapter 326.
2. Chopra A, Patil J, Billempelly V, Relwani J, Tandle HS. WHO-ILAR COPCORD Study. WHO International League of Associations from Rheumatology Community Oriented Program from Control of Rheumatic Diseases. Prevalence of rheumatic diseases in a rural population in western India: A WHO-ILAR COPCORD Study. J Assoc Physicians India. 2001; 49:240-6. [PubMed]
3. Longo DL, Fauci AS, Kasper DL, Jameson JL, Hauser SL, Loscalzo J. Harrison's Principle of Internal Medicine. 17th Ed New York, NY: McGraw Hill; 2010, part 14, section 3, chapter 326.
4. John Emboden, Devid Hellmann, John Stone Current Diagnosis & Treatment- Rheumatology. 2nd Ed.
5. Longo DL, Fauci AS, Kasper DL, Jameson JL, Hauser SL, Loscalzo J. Harrison's Principle of Internal Medicine. 16th Ed New York, NY: McGraw Hill; 2005, part 13, section 2, chapter 312, page no. 2036.
6. Longo DL, Fauci AS, Kasper DL, Jameson JL, Hauser SL, Loscalzo J. Harrison's Principle of Internal Medicine. 16th Ed New York, NY: McGraw Hill; 2005, part 13, section 2, chapter 312, page no. 2041.
7. Longo DL, Fauci AS, Kasper DL, Jameson JL, Hauser SL, Loscalzo J. Harrison's Principle of Internal Medicine. 16th Ed New York, NY: McGraw Hill; 2005, part 13, section 2, chapter 312, page no. 2042.

8. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Sutra Sthana, vividhashitapitiyaadhyaya 28/27. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011, page no. 477.
9. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Sutra Sthana, Aatreyabhadrakapyeyaadhyaya 26/42(5). In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011, page no. 386.
10. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Sutra Sthana, Annapanvidhiadhyaya 27/4. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011, page no. 406.
11. Ambikadatta Shastri, Sushrut Samhita of SushrutaSharirSthan, Garbhavyakaran, Chapter 4, verse 16 Dalhan Commentary Chaukhamba Sanskrit series, Varanasi 2007, page no.59
12. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Siddhi Sthana, Kalpanasiddhiradhyaya 1/40. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011, page no. 954.
13. Sharangadhar, Sharangadhar Samhita, Madhya khand, 2/161, Tripathi B. Editor, 19th Edition, Published by ChaukhambhaSurbharatiPrakashan, Varanasi 2007
14. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Siddhi Sthana, Bastisutriya-Siddhiradhyaya 3/24. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011, page no. 985.
15. Alpesh Joshi-Matra Basti-Shamana Yoga-Sandhivata (Osteo-Arthritis)-Kc-2004- page no. 115 Ipgt&Ra, Jamnagar, Gujarat.
16. Agnivesha, Charaka, Dridhabala. Charaka Samhita with Chakrapani commentry, ChikitsaSthana, VatvyadhichikitsaAdhyaya 28/72. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011,
17. Agnivesha, Charaka, Dridhabala. Charaka Samhita, ChikitsaSthana, VatvyadhichikitsaAdhyaya. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011,
18. Longo DL, Fauci AS, Kasper DL, Jameson JL, Hauser SL, LoscalzoJ. Harrison's Principle of Internal Medicine. 16th Ed New York, NY: McGraw Hill; 2005, part 13, section 2, chapter 312, page no. 2042.
19. Longo DL, Fauci AS, Kasper DL, Jameson JL, Hauser SL, LoscalzoJ. Harrison's Principle of Internal Medicine. 16th Ed New York, NY: McGraw Hill; 2005, part 13, section 2, chapter 312, page no. 2042.
20. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Sutra Sthana, vividhashitapitiyaadhyaya 28/27. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011, page no. 477.
21. Arundatta, AshtangHridaya –Arundatta tika, Sutrashtan 21/22, BhishagacharyaHarishtrinParadkar, Edited by Chaukambha Sanskrit Pratishtan Varanasi-1998
22. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Sutra Sthana, vividhashitapitiyaadhyaya 28/27. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011, page no. 477.
23. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Siddhi Sthana, Bastisutriya-Siddhiradhyaya 3/24. In: Kushawaha H, editors. reprint ed. Varanasi: Chaukambha Sanskrit Pratishtan; 2011, page no. 985.
24. Vasudevan M. R., Mahadevan L. principles and Practice of Basti, chapter 12, Mode of action of Basti, page no. 172-177, published by Dr. Y. Mahadeva Iyers, Derisanamcope-Kanyakumari district- 2013

Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Gulhane Harshad et al: A Clinical Randomized Open Study On The Management Of Sandhigatavata W.S.R. To Osteoarthritis By Patola (Tricosanthus Dioca) Kshir Basti. International Ayurvedic Medical Journal {online} 2021 {cited March, 2021} Available from: http://www.iamj.in/posts/images/upload/562_571.pdf