

Clinical study of *Agnikarma* and *Panchatikta Guggulu* in the management of *Sandhivata* (osteoarthritis of knee joint)

Aneesh Vasudeva Sharma, Tukaram Sambhaji Dudhamal, Sanjay Kumar Gupta, Vyasadeva Mahanta

Department of Shalya Tantra, IPGT & RA, Gujarat Ayurved University, Jamnagar, Gujarat, India

Abstract

Background: *Sandhivata* is a disease described under *Vatavyadhi* and resembles osteoarthritis (OA) in respect to etiology, pathology, and clinical features. Knee joints are more prone to be affected by this disease because it is the most frequently involved joint in daily works. *Acharya Sushruta* has indicated *Agnikarma*, when severe pain occurs in *Twak*, *Mamsa*, *Sira*, *Snayu*, *Sandhi*, and *Asthi* due to *Vata Prakopa*. *Panchatikta Guggulu* is a formulation mentioned in *Chakradatta* and *Bhaishajya Ratnavali* in the context of *Kushtha Roga* where it is also indicated for *Sandhigata Vata* and *Asthigata Vata*. **Aims:** The aim of this study is to evaluate the comparative effect of *Agnikarma* alone and *Agnikarma* along with *Panchatikta Guggulu* orally in *Janugata Sandhivata* (OA of knee joint). **Materials and Methods:** Thirty-three patients of *Janugata Sandhivata* were registered and randomly divided into two groups. In Group A ($n = 18$), *Agnikarma* was done with *Panchadhatu Shalaka* once every week for one month while in Group B ($n = 15$), *Agnikarma* along with *Panchatikta Guggulu* orally was given for one month. Weekly assessment was done for relief in *Sandhishula* (pain), *Sparshaasahyata* (tenderness), *Sandhisphutana* (crepitus), *Sandhigraha* (stiffness) by subjective gradation, and range of movement (ROM) was recorded in research proforma. **Results:** In *Sandhishula*, 86% relief was found in Group A whereas 77.78% relief was obtained in Group B. *Sparshaasahyata* was reduced by 69% in Group A while 87.78% in Group B. Nearly 39% improvement was seen in *Sandhisphutana* in Group A while 46.67% in Group B. In *Sandhigraha*, 63% relief was obtained in each of the groups. The patients got relief from the pain after first sitting of *Agnikarma* in both the groups. The relief was sustained for more than 3 months in most of the patients. There was no significant difference in radiological findings before and after treatment in both the groups. **Conclusion:** It was concluded that *Agnikarma* is effective in the management of pain in the *Sandhivata*. However, the addition of *Panchatikta Guggulu* in the treatment provides better efficacy on joint stiffness and crepitus. Further analysis showed that better relief in pain was observed in Group A while relief in tenderness, crepitus, and stiffness was found better in Group B.

Keywords: *Agnikarma*, knee joint, osteoarthritis, *Panchadhatu Shalaka*, *Panchatikta Guggulu*, *Sandhivata*

Introduction

Vata vitiated in *Sandhi* is the main phenomena in the pathogenesis of *Sandhivata*. The condition is more painful when the important joints of the body such as knee joint are involved. With aging *Dhatu*s undergo *Kshaya* (degeneration), thus leading to *Vata Prakopa* and making individual prone to *Sandhivata* (OA). It is the most common articular disorder which begins asymptotically in the second and third decades and is extremely common by age of 70 years.^[1] Almost all persons by age of 40 have some pathological changes in weight-bearing joint. Twenty-five percent females and 16% males have symptomatic OA.^[2] Till the age of 55, it occurs equally in both sexes; after 55, the incidence is higher in women. In modern medicine mainly analgesics, anti-inflammatory drugs, and surgery are the options for the

treatment of OA.^[2] Although these treatment measures provide remarkable recovery, the patients have to take it lifelong causing adverse effects. Knee joint replacement is costly and even after surgery; the patient has to continue analgesics for a long time. *Agnikarma* is therapeutic thermal cauterization described in detail by *Acharya Sushruta*.^[3] Various materials can be used for performing *Agnikarma*; however, in this study, *Panchadhatu Shalaka* innovated by Prof. P. D. Gupta was selected because it is found as efficient for heat transfer and able to produce *Samyak Dagdha*.^[4] *Panchatikta Guggulu* is

Address for correspondence: Dr. Tukaram Sambhaji Dudhamal,
Department of Shalya Tantra, IPGT & RA,
Gujarat Ayurved University, Jamnagar-361 008, Gujarat, India.
E-mail: drtsdudhamal@gmail.com

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a formulation described in *Bhaishajya Ratnavali* in *Kushtha Rogadhikara* where it is also indicated for *Sandhigata Vata* and *Asthigata Vata*.^[5] The original reference is available in *Chakradutta*.^[6]

In the previous research studies also *Agnikarma* was found to be effective in musculoskeletal disorders.^[7-9] Hence, considering above facts, this study was planned to evaluate the efficacy of *Agnikarma* alone and *Agnikarma* along with *Panchatikta Guggulu* orally in *Janugata Sandhivata* (OA of knee joint).

Materials and methods

Patients suffering from *Sandhivata* were selected from OPD and IPD of the Department of Shalya Tantra irrespective of their age, sex, religion, occupation, etc. Patients were diagnosed on the basis of signs and symptoms based on Ayurvedic as well as modern texts. The study was initiated after getting, Institutional Ethics Committee clearance vide letter no. PGT/7-A/Ethics/2012-2013/1964; dated: 21/09/2012. CTRI registration was done retrospectively with No. CTRI/2014/04/004552. Written informed consent was taken from each patient at the time of registration.

Inclusion criteria

Patients between the age group 45 and 70 years of either gender having signs and symptoms such as *Vedana* (pain), *Sparshaasahyata* (tenderness), *Sandhisphutana* (crepitus) or *Sandhigraha* (stiffness), and *Sandhishotha* (swelling) in the knee were included in the study.^[10]

Exclusion criteria

Patients below 45 years and above 70 years were excluded from the study. Patients having systemic diseases such as diabetes mellitus, severe anemia, effusion of affected knee joint, rheumatoid arthritis, paralysis, Parkinson's disease, malignancy, and infectious diseases such as syphilis, leprosy, acquired immunodeficiency syndrome, and tuberculosis were also excluded from this study.

Laboratory investigations

Laboratory investigations such as blood sugar - fasting blood sugar (FBS) and postprandial blood sugar (PPBS), hemogram (hemoglobin/Hb%), total leukocyte count (TLC), differential leukocyte count (DLC), erythrocyte sedimentation rate (ESR), serum uric acid, rheumatoid factor (RF) qualitative, and urine and stool (microscopic and macroscopic) were done at baseline and after treatment. The RF was done only once to exclude the other type of arthritis.

Radiological investigations

X-ray of knee joint anteroposterior (AP) view and lateral views was taken before and after the treatment.

Grouping and posology

- Group A: In this group, *Agnikarma* with *Panchadhatu Shalaka* was done in 18 patients of *Sandhivata* (OA knee joint)

- Group B: In this group, 2 tablets of *Panchatikta Guggulu* (each 500 mg) were administered 3 times a day after meals for 1 month along with *Agnikarma* with *Panchadhatu Shalaka* in 15 patients of *Sandhivata*.

Pancha Dhatu Shalaka (innovated by Prof. P. D. Gupta) is made of *Tamra* (copper-40%), *Lauha* (iron-30%), *Yashada* (zinc-10%), *Rajata* (silver-10%), and *Vanga* (tin-10%).^[11]

Procedure of *Agnikarma*

Agnikarma was performed in three stages as *Purva Karma*, *Pradhana Karma*, and *Pashchat Karma*.

Purvakarma

Agnikarma room was well equipped with all the required *Agropaharaniyani* (proper instrumentation) described by *Acharya Sushruta*.^[12] *Haridra Churna*, small pieces of *Kumari Patra*, swab holding forceps, *Plota* (gauze piece), *Pichu* (cotton), gas stove, *Shalaka*s, Betadine solution, etc., were kept ready for use. The patient was advised to take boiled rice mixed with curd (*Pichhila*, *Snigdha* and *Laghu Ahara*) before the procedure.

Pradhana Karma

Painting of the local part (affected knee joint) was done with Betadine solution, and draping was done with sterilized cut sheet. *Panchadhatu Shalaka* was heated in gas stove up to red hot, and *Agnikarma* was done for 2 s at maximum painful site of knee joint, i.e., lateral, medial, or anterior part in *Bindu Vishesha*. Maximum 15 points and minimum 10 points were made at 0.5cm space between each other and care was taken to produce *Samyak Dagdha Vrana*. This procedure was repeated once in a week for 1 month. Patients were assessed after a period of 1 month for follow-up.

Paschatkarma

After making *Samyak Dagdha Vrana*, fresh pulp of *Ghridakumari* (*Aloe vera*) was applied immediately to reduce the burning pain. *Haridra* powder (*Curcuma longa*) was sprinkled on *Samyak Dagdha Vrana* and was covered with *Plota* (gauze piece), and proper *Patta Bandhana* (bandaging) was done. Patients were advised to apply honey mixed with ghee twice daily for 3 days. Patients were instructed to avoid contact with water on these lesions for at least 24 h. Patients were instructed to avoid exposure to cold water, and avoid eating of *Dal* curry made up of black gram or recipes made up of potato, brinjal, etc., at least for 1 month.

Assessment criteria

Subjective parameters

The gradation for symptoms such as pain, tenderness, crepitus, and stiffness was done and were assessed before and after the completion of treatment [Appendix-1].

Objective parameters

Measurement of the girth of the knee joint was done using a measuring tape around the girth of the knee before treatment and

after treatment in the follow-up period to assess the changes in the swelling of the knee joint.^[13] The measurement was taken in centimeters at three anatomical sites of knee joint- i.e., middle point of patella, two inches above mid-patella, and two inches below mid patella.

The angle of the knee joint was measured in degrees using a goniometer with the patient in the supine position. It was done before treatment and after treatment to assess the progress of range of movement (ROM). Normal flexion of knee joint is 135–150° and normal extension is 0–10°.

Radiological parameters

The X-ray of the knee joint was taken before and after treatment and was also graded [Appendix-1].

Statistical analysis

For non parametric data (subjective parameters), Wilcoxon signed rank test was applied within the groups, and Chi-square test was used between the two groups. For parametric data (objective parameter), paired test was applied within group, and unpaired test was used between the groups. Then, mean score, percentage of relief, \pm standard deviation (SD), standard error (SE), *t* and *P* values were calculated.

Observations

In Group A (Agnikarma done with Panchadhatu Shalaka), total 19 patients were registered; among them, 18 patients completed the treatment, and one patient dropped out. In Group B (Agnikarma and Panchatikta Guggulu orally), 15 patients were registered and all the patients completed the treatment. The demographic data reveals that maximum numbers of patients (67.65%) were found in between 56 and 70 years age group. OA is degenerative arthritis and has a slow progressive degeneration process which becomes symptomatic after 50 years. 50% of the regular patients in this study were laborer which signifies that wear and tear to major joints occur due to excessive repetitive stress/load and later develops into OA. 50% patients were taking Vishamashana which leads to Vata Vriddhi and in turn impairs the Agni. 64.7% patients were accustomed to Atiruksha Ahara which causes Vata Dosha Vriddhi thereby Asthi and Sandhi (Ashraya of Vata) becomes vitiated and Sandhivata develops. In 73.52% patients,

Divaswapna was observed as one of the Nidana. Daytime sleep increases Kapha and Meda which is responsible for weight gain and Agnivaishmya which is the common risk factor for Sandhivata. The data reveals that among female patients, 66.66% females had attained menopause which is also a major risk factor for OA.

The excess weight while walking is transferred to the knee joint causing more physical stress to the joint.^[14] In 79.41% patients, the onset of disease was gradual that is supportive of the gradual degenerative process in OA. In 64.71% patients, OA was affected bilaterally as knee joint is weight-bearing joint which signifies that wear and tear affects both the joint equally.

Among chief complaints, Sandhishula (knee joint pain) was present in all the patients. In mild cases of OA, the joint pain may be due to the inflammation of the synovium or capsule, stretching of the ligaments, or muscle spasm. In some cases, it may be due to stretching of nerve endings in the periosteum covering osteophytes. In 94.11% patients, Sandhisphutana (crepitus on moving the joint) was observed that indicates the Vata Prakopa and crackling sensation likely occurs due to roughening of surfaces inside the joint. Sparshaasahyata (tenderness) was found in 91.17% patient's, and Akunchana Prasarana Vedana (difficulty in joint movements) was reported in 67.64% of patients occurs due to aggravation of Vata Dosha and Kapha Kshaya. The pain and restriction during flexion and extension may be due to osteophytes or due to chronic synovitis and thickening of the joint capsule. Sandhigraha was seen in 61.76% patients, and Sandhishotha was observed in 61.64% patients. Shita Guna Vriddhi of Vayu can cause Sandhigraha (stiffness). The stiffness of the knee in patients with initial stages of OA is due to pain and muscle spasm. In patients with late OA, stiffness develops due to capsular contracture and incongruity of the joint surfaces. Sandhishotha (swelling) indicates that OA was advanced in these cases because swelling is a late feature. It occurs due to the effusion caused by inflammation of the synovial tissues. Sandhishotha as is an associate symptom in OA. The number of Bindu to be applied for Agnikarma is not fixed; it depends on the severity of pain of knee joint. Hence, 10–30 Bindu type

Table 1: Effect of Agnikarma in Group A

Symptoms	BT	AT	Percentage of relief	SD±	SE±	W	t+	P
Sandhishula (joint pain)	2.611	0.388	86	0.4895	0.0250	171	171	<0.0001
Sparshaasahyata (tenderness)	1.000	0.166	69	0.6183	0.1457	91	91	0.0002
Sandhisphutana (crepitus)	1.222	0.888	39	0.4851	0.1143	21	21	0.0313
Sandhigraha (stiffness)	2.500	0.611	63	1.132	0.2668	120	120	<0.0001
Sandhishotha (swelling) Middle point of patella	38.36	37.50	2.36	0.589	0.139	17	6.20	<0.001
Sandhishotha (swelling) 2 inch above middle of patella	38.72	37.94	2.14	0.461	0.109	17	7.160	<0.001
Sandhishotha (swelling) 2 inch below middle of patella	35.55	35.13	1.29	0.493	0.116	17	3.589	0.002
Flexion	117.22	136.94	17.18	9.922	2.339	17	-8.433	<0.001
Extension	-23.33	-13.88	25.27	13.49	3.180	17	-2.970	0.009
X-ray changes	2.056	1.944	5.5	0.323	0.0762	17	1.458	0.163

SD: Standard deviation, BT: Before treatment, AT: After treatment, SE: Standard error

of *Agnikarma* was performed in this study and there was no correlation of number of *Bindu* and relief in sign and symptoms.

Results

In *Sandhishula*, 86% relief was found in Group A whereas 77.78% relief was obtained in Group B. *Sparshaasahyata* was reduced by 69% in Group A while 87.78% in Group B. 39% improvement was seen in *Sandhisphutana* in Group A while 46.67% relief was found in Group B. In *Sandhigraha*, 63% relief was obtained in each group [Table 1].

Sandhishotha (swelling at knee joint) was measured with measuring tape at three sites, i.e., mid-patella, two inch above mid-patella and two inch below mid-patella. In patients of Group A, relief in swelling was found to be 2.36% at mid-patella, 2.14% at two inch above mid-patella, and 1.29% at two inch below mid-patella. In patients of Group B, relief in swelling was found to be 3.55% at mid-patella, 3.26% at two inch above mid-patella, and 2.73% at two inch below mid-patella, which was statistically significant ($P < 0.001$). In OA, chronic and low-grade inflammation always exists. Joint swelling can be bony or soft-tissue swelling, and it may be due to synovitis, effusion, or bony hypertrophy. Synovial effusion, if present, is usually not large. OA can be divided into four stages, and swelling develops only in 3rd stage, in which there is gross osteoarthritic changes. Comparison between Group A and Group B did not show significant difference in percentage relief of knee joint swelling at all sites. Clinically also during the assessment at weekly interval, relief in swelling was almost similar in both groups.

The ROMs of knee joint that is flexion and extension was assessed using goniometer and measured in degrees. In Group A, after *Agnikarma* improvement in flexion (17.18%), and extension (25.27%) was obtained which was statistically significant ($P = 0.009$). In Group B, improvement in flexion (18.25%) and extension (38.57%) was noted which was statistically highly significant ($P < 0.001$). *Agnikarma* alone and *Agnikarma* with *Panchatikta Guggulu* provided similar effect in improving the flexion. However, in case of extension significant improvement was seen in Group B where *Panchatikta Guggulu* was administered along with *Agnikarma*.

In the assessment of radiological findings, there was no significant difference in the joint space changes before and after treatment. 5.5% improvement was seen in Group A, and 12.22% improvement was seen in Group B. It may be because of the *Asthikshayahara* and *Majjakshayahara* properties of *Panchatikta Guggulu*.^[15] Since the period of treatment was 1 month, more period is needed for the validity of result, i.e., the action of *Panchatikta Guggulu* for the prevention of bone degeneration. Data showed that at least 30% relief has been noted in each and every patient of both the groups in sign and symptoms. Two patients achieved complete remission which might be due to mild reduction of joint space in these cases. The better improvement was seen in Group A even though *Panchatikta Guggulu* tablet had been given along with *Agnikarma* internally in Group B [Table 2]. The recurrence of symptoms was seen in 64.71% patients in those who had severe joint space reduction.

Discussion

The ingredients of *Panchatikta Guggulu* have *Tikta Rasa*, *Ushna Virya*, and *Madhura* and *Katu Vipaka*. It may increase *Dhatwagni* and *Poshana* of all the *Dhatus*, especially *Asthi* and *Majja Dhatu* which controls *Asthi* and *Majja Kshaya* (the degeneration process). *Tikta Rasa* is predominant in *Akasha* and *Vayu Mahabhuta* which helps in preservation of normal health of *Asthi Dhatu*. *Tikta Rasa* has got *Deepana* and *Pachana* effect that might have helped to improve general health and thus strengthens the whole body as well as joints.^[16] *Tikta Rasa* is having *Lekhana*, *Kleda*, *Meda*, *Pitta*, *Shleshma*, and *Shoshana* properties.^[17] Hence, along with *Guggulu* which is *Lekhana* and has *Katu Rasa*, it helps in the weight reduction of the patients and management of OA. *Purana Guggulu* also acts as *Rasayana* which may help to prevent any degenerative changes in the body. *Ghrta* is having property such as *Yogavahi* which is helpful to increase bioavailability of other drugs without losing its own property. *Ghrta* is *Vata-Pittashamaka*, *Balya*, *Agnivardhaka*, *Madhura*, *Saumya*, *Sheeta Virya*, *Shulahara*, *Jwarahara*, *Vrishya*, and *Vayasthapaka*.^[18] Thus, it pacifies *Vata*, improves the general condition of the body, and acts as a rejuvenator of the body causing in the *Samprapti Vighatana* of the *Sandhivata*. Pharmacologically, *Guggulu* possesses

Table 2: Effect of Agnikarma and Panchatikta Guggulu in Group B

Symptoms	BT	AT	Percentage of relief	SD±	SE±	W	t+	P
<i>Sandhishula</i> (joint pain)	2.600	0.467	77.78	0.6399	0.165	120	120	<0.0001
<i>Sparshaasahyata</i> (tenderness)	1.467	0.267	87.78	0.414	0.107	120	120	<0.0001
<i>Sandhisphutana</i> (crepitus)	1.733	0.867	46.67	0.516	0.133	78	78	0.0005
<i>Sandhigraha</i> (stiffness)	2.467	1.000	63.3	0.640	0.165	105	105	0.0001
<i>Sandhishotha</i> (swelling) middle of patella	39.267	38.000	3.55	0.458	0.118	14	10.71	<0.001
<i>Sandhishotha</i> (swelling) 2 inch above patella	38.633	37.367	3.26	0.594	0.153	14	8.26	<0.001
<i>Sandhishotha</i> (swelling) 2 inch below patella	35.667	34.767	2.73	0.280	0.0724	14	12.435	<0.001
Flexion	113.667	134.667	18.25	5.732	1.480	14	-14.189	<0.001
Extension	-25.667	-15.000	38.57	7.037	1.817	14	-5.870	<0.001
X-ray changes	1.600	1.400	12.22	0.414	0.107	14	1.871	0.082

SD: Standard deviation, BT: Before treatment, AT: After treatment, SE: Standard error

anti-inflammatory, immunomodulatory, and antilipidemic action.^[19]

Sandhivata is produced by vitiated *Vata Dosha* along with *Anubandha* of *Kapha Dosha*. The *Ushna*, *Tikshna*, *Sukshma*, and *Ashukari Gunas* of *Agni* are just opposite to the *Gunas* of *Vata* and *Kapha*. The physical heat from the red hot *Shalaka* is transferred as therapeutic heat to *Twak*. The *Ushna Guna* of *Agni* remove *Srotovarodha* locally and *Mamsadi Dhatus* get the proper nourishment due to more blood circulation.

The minimum heat required for the skin burn is measured as 40.55°C.^[20] The heat above 43°C produced by red hot *Shalaka* produces painful peripheral stimulation on the skin which preferentially activates low-threshold myelinated nerve fibers. The afferent input from these fibers inhibits the propagation of nociception carried through unmyelinated fibers developing due to the stretching of nerve fibers in OA. This results in descending inhibitory pathway which modulates pain sensation with the release of specific hormones or chemicals such as beta-endorphin and met-enkephalin that can have analgesic effect which can reduce or inhibit pain sensation. The area of the brain that stimulates the release of these hormones is the hypothalamus.^[21] The effect of *Agnikarma* on pain produced in *Sandhivata* is temporary which depend on the production of the endorphins. Endorphin secretion varies among the individuals. This means that two people who suffer with the same degree of pain will not necessarily produce similar levels of endorphins.^[22]

Application of heat increases blood circulation to affected area so as to flush away inflammatory substance and reduces the swelling.^[23] Rise in temperature induces relaxation of muscles and increase the efficiency of its action by increasing blood circulation and the muscle fibers contract and relax more quickly which makes it possible to perform activity by extremities efficiently.^[24]

The minor complications noted during clinical study were post *Agnikarma* scar developed due to burn which healed within 2 weeks and the discoloration which disappeared within 1 month. In 4 patients, *Agnikarma* sitting was postponed due to pus formation or local tenderness. It might be due to lack of wound care or improper hygiene by the patient. These patients were managed by local dressing with *Jatyadi Taila*. Severe burning at local site of *Agnikarma* was seen in five patients which might be due to the *Pitta* dominated *Prakriti* and *Agnikarma* was done during *Sharada* (autumn) and *Greeshma* (summer) season which are the seasons that are contraindicated by *Sushruta* for *Agnikarma*.^[25] These patients were managed with local application of *Aloevera* pulp.

Conclusion

The present study concluded that *Agnikarma* alone and along with *Panchatikta Guggulu* has shown encouraging result on

the cases of *Sandhivata* by providing relief to knee joint pain, tenderness, swelling and also improved the ROM of knee joint. Hence, *Agnikarma* a non pharmacological para-surgical modality useful in the management of *Sandhivata* (OA of knee joint).

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Conflicts of interest

There are no conflicts of interest.

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Appendix 1: Gradations for sign and symptoms

Symptoms	Description	Gradations
Pain	No pain	0
	Mild pain exaggerated by movement but subsided by rest	1
	Moderate pain not relieved by rest but not disturbing sleep or routine activities	2
	Severe pain disturbing sleep and routine activities but relieved by oral analgesics	3
	Unbearable pain requiring injectable analgesics	4
Tenderness	No tenderness	0
	Mild tenderness feels, pain on pressure but does not withdraw joint	1
	Moderate tenderness, feels pain, and on touch withdraw the joint	2
	Severe pain, patient does not allow the joint to touch	3
Crepitus	No crepitus	0
	Palpable crepitus	1
	Audible crepitus	2
Stiffness	No stiffness	0
	Mild stiffness	1
	Moderate stiffness	2
	Severe difficulty due to stiffness	3
	Severe stiffness persisting >15 min	4
X-ray finding	Normal X-ray	0
	Mild reduction of joint space	1
	Moderate reduction of joint space	2
	Severe reduction of joint space	3

हिन्दी सारांश

संधि वात (ऑस्टियोआर्थराइटिस) की चिकित्सा में अग्निकर्म एवं पंचतिक्त गुग्गुलु का चिकित्सकीय अध्ययन

अनीष वसुदेव शर्मा, टी एस दुधमल, संजय कुमार गुप्ता, व्याससदेव महंत

संधिवात का वर्णन वात व्याधि के अंतर्गत किया गया है एवं निदान संप्राप्ति एवं लक्षणों के आधार पर यह ऑस्टियोआर्थराइटिस से साम्यता रखता है। इस व्याधि से जानु संधि अधिक प्रभावित होती है। आचार्य सुश्रुत ने त्वक्, मांस, सिरा, स्नायु, संधि एवं अस्थि में वात प्रकोप के कारण होने वाले शूल में अग्निकर्म का निर्देश किया है। पंचतिक्त गुग्गुलु का चक्रदत्त एवं भैषज्य रत्नावली में कुष्ठ रोग के प्रकरण में वर्णन है जहाँ संधिवात में भी इसका उपयोग बताया गया है। प्रस्तुत शोध कार्य में जानुगत संधिवात में मात्र अग्निकर्म एवं पंचतिक्त गुग्गुलु के साथ अग्निकर्म के प्रभाव का तुलनात्मक अध्ययन किया गया है। इस उद्देश्य के लिए जानुगत संधिवात के ३३ रोगियों को अ (संख्या -१८) और ब (संख्या -१५) समूहों में विभाजित किया गया। चार सप्ताह के लिए समूह -अ के रोगियों में पंचधातु शलाका से सप्ताह में एक बार अग्निकर्म किया गया जबकि समूह-ब के रोगियों में अग्निकर्म के साथ पंचतिक्त गुग्गुलु को खाने के लिए दिया गया। वेदना, स्पर्शअसह्यता, संधि स्फुटन, संधिग्रह में कमी को विषयात्मक एवं गति की सीमा को उद्देश्यात्मक मापदंड के आधार पर इनका साप्ताहिक विश्लेषण किया गया। जिसमें संधि शूल में समूह-अ में ८६% तथा समूह-ब में ७७.७८%, स्पर्शअसह्यता में समूह-अ में ६९% तथा समूह-ब में ८७.७८% सुधार हुआ। संधि स्फुटन में समूह-अ में ३९%, तथा समूह-ब में ४६.६७% सुधार हुआ। जबकि संधिग्रह में दोनों समूहों में ६३% सुधार हुआ। गतिशीलता की सीमा में दोनों समूहों में आकुंचन में समान एवं प्रसारण में समूह-ब में अधिक सुधार प्राप्त हुआ। सकल परिणाम में दोनों समूहों में अग्निकर्म के प्रथम सप्ताह के बाद वेदना में सुधार प्राप्त हुआ। अधिकांश रोगियों में यह ३ माह तक रहा। एकसरे परीक्षण में चिकित्सा पूर्व एवं चिकित्सा पश्चात अधिक अंतर प्राप्त नहीं हुआ। समूह-अ में संधि वेदना में अच्छा सुधार मिला जबकि समूह-ब में स्पर्शअसह्यता, संधि-स्फुटन व संधिग्रह में अच्छा परिणाम प्राप्त हुआ। इस परीक्षण में यह निष्कर्ष निकाला गया कि संधिवात की चिकित्सा में अग्निकर्म एवं पंचतिक्त गुग्गुलु प्रभावी हैं।