

## **An Ayurvedic Approach to Sandhivata or Osteoarthritis (OA)**

**Archana Meena<sup>\*1</sup>, Manisha Choudhary<sup>2</sup>, Preeti Verma<sup>3</sup>, Pramod Kumar Mishra<sup>4</sup>,  
Brahmanand Sharma<sup>5</sup>, Vinod Kumar Gautam<sup>6</sup>**

<sup>1</sup>M.D Scholar, <sup>2</sup>M.D Scholar, <sup>3</sup>M.D Scholar, <sup>4</sup>Associate Professor HOD, <sup>5</sup>Assistant Professor, <sup>6</sup>Assistant Professor

P.G. Department of Kayachikitsa, University College of Ayurveda, Dr. Sarvepalli Radhakrishnan Rajasthan Ayurved University, Jodhpur Rajasthan, India

**\*Corresponding Author**

**Email Id: archnameena095@gmail.com**

### **ABSTRACT**

Ayurveda is the system of medicine which maintains physical, psychological as well as spiritual values of human being. Osteoarthritis is the most common chronic, non-inflammatory degenerative disorder of unknown cause characterized by pain, and gradual loss of articular cartilage. Osteoarthritis is a highly prevalent Rheumatic musculoskeletal disorder that affected 303 million people globally in 2017 and most frequent joints disease with prevalence of 22% to 39% in India. OA is a top cause of disability in older people. It can affect any joint, but preferentially affects the knee, hands, spine, and hips. The disease Osteoarthritis have great resembles with Sandhivata. Sandhivata is one such clinical entity among Vatavyadhi which affects the locomotion in which Dhatukshaya is prime factor which is characterized by certain symptoms like joint pain, swelling, stiffness, painful and restricted movement of joint etc. Various Ayurvedic formulations like Kwatha, Guggulu Kalpana, Ghrita, Taila, Gutika, Rasa Aushadhi and Panchakarma procedures like, Abhyanga, Swedana, Upanaha, Basti, Janubasti, and Agnikarma etc have been described in classics for treatment of Sandhivata. Therefore, Ayurvedic Herbal formulation and Panchakarma procedures are beneficial in such cases and they can positively influence health and quality of life. This study review current thinking on the Nidana (Etiology), Samprapti (pathogenesis), Lakshana (sign and symptoms), investigation, Chikitsa (treatment) of Sandhivata.

**Key words:** Nidana, Samprapti, Lakshana, Dhatukshaya.

### **INTRODUCTION**

In Sandhivata, Sandhi is anatomical aspect and Vata is physiological aspect of the body. It is a type of Vata Vyadhi which commonly occurs in old age due to Vata vitiation and depletion of body tissues (Dhatu). Acharya Charaka has described the disease first separately by the name of "Sandhigata Anila" in Vata Vyadhi and defined it as a disease, with the symptoms of Sotha (swelling), which is palpable as Vatapurna Driti Sparsha and Akunchana Prasarana Vedana (pain on flexion and extension of the joints) [1] Sandhivata is accepted by Chakrapani as GulphaVata or Sandhigata Vat It is considered as

Kashtasadhya (gets treated with difficulty). Acharya Sushruta has described the disease in Vatavyadhi chapter under the subheading of Sandhigata Vata [2]. Sandhivata is a Marma and also a Madhyama Roga Marga Vikara. This also includes all the structures like Snayu, Sira, Asthi, Peshi, Kandara etc.

Osteoarthritis (OA) is the most common form of arthritis. It is a multi-factorial, non-inflammatory degenerative joint disorder which is strongly associated with ageing and is a major cause of pain and disability in older people. Pathologically, it is

defined as a condition of synovial joints characterized by focal loss of articular hyaline cartilage with proliferation of new bone and remodeling of joint contour. Inflammation is not a prominent clinical feature [3]. OA preferentially targets certain small and large joints.

The most commonly involved joints are those near the ends of the fingers, at the base of the thumb, neck, lower back, knee, and hips. The risk factors may be trauma, congenital malformation, or chronic inflammation of the joints. OA of the spine may lead to spinal stenosis with root pain either in the arms or in the lower limbs. Risk is greater in those who are overweight, have legs of different lengths, diabetes, and joint infection or have jobs that result in high levels of joint stress and females who have menopause are prone to OA [4].

### **EPIDEMIOLOGY**

OA is a highly prevalent Rheumatic musculoskeletal disorder that affected 303 million people globally in 2017 and most frequent joints disease with prevalence of 22% to 39% in India. Radiographic evidence of osteoarthritis is present in majority of people over age 65, among them in India [5].

OA begins asymptotically in the 3<sup>rd</sup> and 4<sup>th</sup> decades and is extremely common by age 60. Almost all persons by age 40 have some pathologic change in weight bearing joint. 25% females and 16% males have symptomatic. More Prevalence of osteoarthritis in India is more among menopausal women.

### **ETIOLOGY [6]**

OA Types – two types

- (1) Primary osteoarthritis
- (2) Secondary osteoarthritis

#### **(1) Etiology of Primary Osteoarthritis**

A number of factors predispose primary osteoarthritis. These includes-

- 1) Genetic factors
- 2) Metabolic disorders
- 3) Age- mostly occurs in old age
- 4) Idiopathic a vascular necrosis- it is occasionally seen in alcoholic middle aged men with
- 5) high serum lipid and altered blood coagulability endocrinal factors
- 6) Obesity- mainly affects women in comparison of men.

#### **(2) Etiology of Secondary Osteoarthritis**

It is most common. Secondary osteoarthritis is usually caused by local factors which include-

- 1) Trauma
- 2) Mal-alignments
- 3) Inadequate blood supply
- 4) Infections of the joints *e.g.* Pyogenic, tuberculosis *etc.*
- 5) Disease interfering with the nerve supply of the joint may cause osteoarthritis
- 6) Inflammatory diseases
- 7) Nutritional bone disease *e.g.* rickets in infancy, osteomalacia in adults may cause osteoarthritis [8].

### **NIDAN OF SANDHIVATA [7]**

#### **(1) Aaharaj Nidan**

- Excessive consumption of dry foods
- Excessive consumption of astringent, bitter, pungent foods.
- Excessive consumption of cold foods and activities
- Fasting in excess and intake the less amount of food, unwholesome foods

- Taking meal on meal

#### **(2) Viharaj Nidan**

- Excessive exercise,
- Fall, injury and fracture
- Excessive vigil (awakening all night)
- Suppression of nature body urges (reflexes)
- Excessive administration of cleansing procedure (*Panchakarma*)
- Psychological stress (fear, anger, tensions, irritation)
- Cloudy and rainy season

- Day sleeping, excessive running, jumping walking improper gait, loud speaking.
- (3) **Other causes**
  - Other chronic illness
  - Depletion in *Ras Rakta Dhatu*
  - Formation of excessive metabolic toxins
  - *Vata* vitiation during 3<sup>rd</sup> quarter of day & night

## **PATHOGENESIS**

### **Types and Pathogenesis**

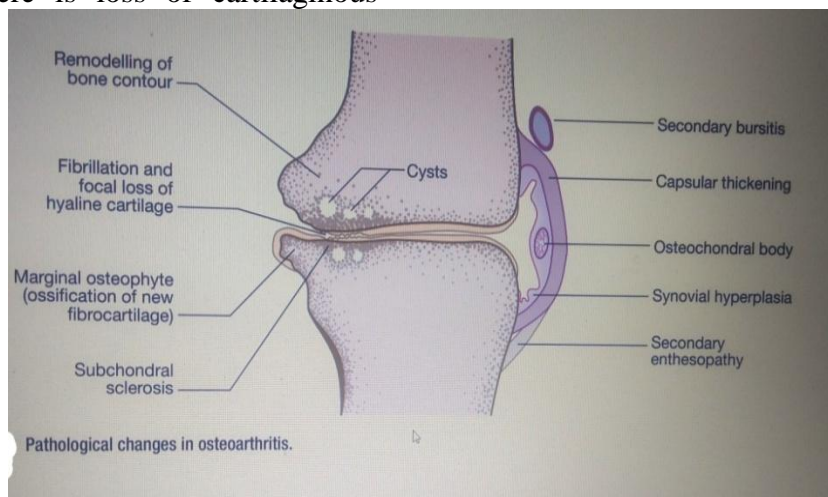
- 1) **Primary OA** occurs in the elderly, more commonly in women than in men. Probably, wear and tear with repeated minor trauma, heredity, ageing, obesity, all promote to focal degenerative changes in the articular cartilage of the joints. Genetic factors favouring susceptibility to develop OA. Genetic mutation in proteins which regulate the cartilage growth have been identified e.g. FRZB gene.
- 2) **Secondary OA** may appear at any age and is the result of any previous wear and tear situation involving the joint such as previous fracture, injury, inflammation, loose bodies and congenital dislocation of the hip.

**Articular Cartilage:** The regressive changes are most marked in the weight bearing regions of articular cartilages. Primarily, there is loss of cartilaginous

matrix resulting in progressive loss of normal metachromasis. It is followed by focal loss of chondrocytes and at other places proliferation of chondrocytes forming clusters. Further progression of the process causes loosening, flaking and fissuring of the articular cartilage resulting in breaking off of pieces of cartilage exposing subchondral bone. Radiologically this progressive loss of cartilage is apparent as narrowed joint space.

**Bone:** The denuded subchondral bone appears like polished ivory. There is death of superficial osteocytes and osteoclastic hyperactivity causing rarefaction, microcyst formation and occasionally microfractures of the subjacent bone. These changes result in remodelling of the bone and changes in the shape of joint surface creating to flattening and mushroom like appearance of the articular end of the bone. The margins of the joints respond to cartilage damage by osteophyte or spur formation. Loosened and fragmented osteophytes may form free joint mice or loose bodies.

**Synovium:** Initially there are no pathologic changes in the synovium but in advanced case there is low- grade chronic synovitis and villous hypertrophy. There may be some amount of synovial effusion associated with chronic synovitis [8]

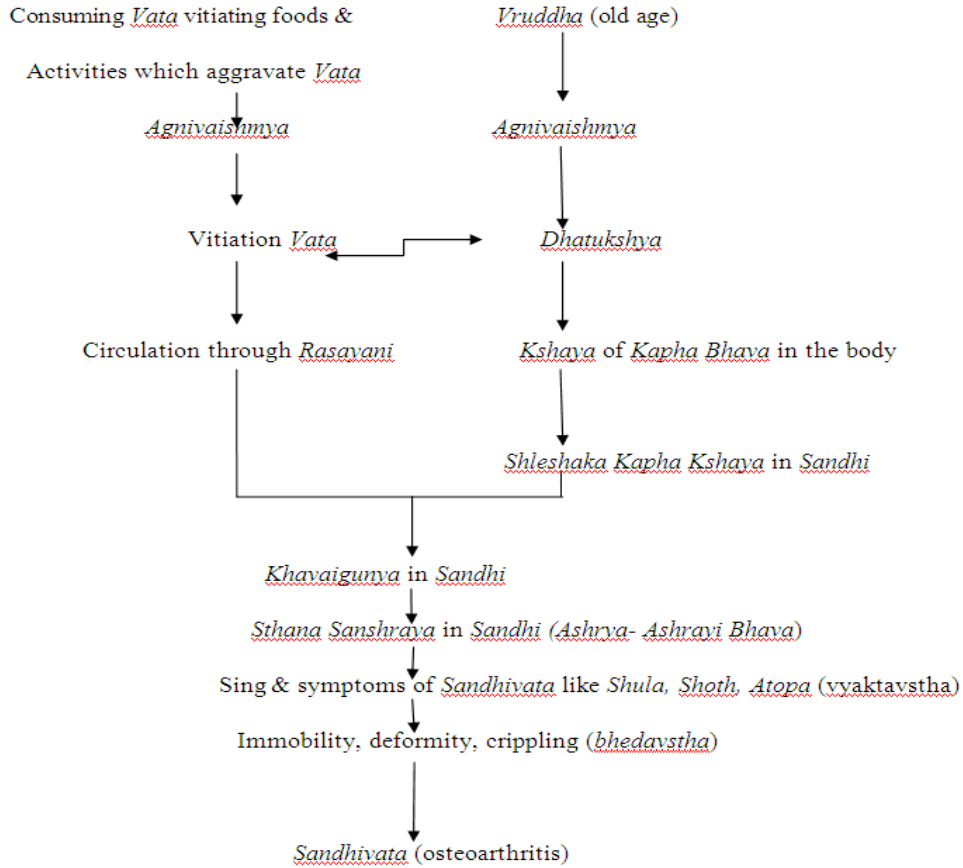


*Fig.1. Representing Types and Pathogenesis*

**SAMPRAPTI**

“देहे स्रोतांसि रिक्तानि पुरयित्वाऽनिलो बली।  
करोति विविधान् व्याधीन् सर्वाङ्गे एकाङ्ग  
संश्रितान्॥ (च. चि. २८/१८)

Vata is vitiated in body due to consuming Vata aggravating foods. This vitiation Vata lodges in *Rikta Srotasa*. Vata after settling in *Rikta Srotasa* produce disease related to that particular *Srotasa* [9].



**SAMPRAPTI GHATAKA [10]**

*Dosha- Vata- Vyana Vruddhi*  
*Kapha - Shleshaka Kshaya*  
*Dooshya- Ras, Rakta, Asthiya*  
*Adhishthan - Asthi Sandhi*  
*Srotas- Asthivaha, Majjavaha*  
*Srotodushti Prakara- Sanga, Granthi,*  
*Vimargagamana*  
*Agni- Vishamagni*  
*Roga Marga- Madhyama*  
*Udbhavasthana- Pakvashaya*  
*Vyadhiswabhaba- Chirakari*  
*Sadhyasadhyata- Kashtasadhya*

**POORVAROOPA (Predominant feature) [11]**

“अत्यक्तं लक्षणं तेषां पूर्वरूपं इति स्मृतम् ।  
आत्मरूपं तु तद् व्यक्तमपायो लघुता पुनः ॥  
(च .चि .२८/२०)

Because of the *Sthana Sanshraya* of the *Dosha* on the *Sandhi Sthana Poorvaroop*a starts to manifest. However it is difficult to observe them in *Sandhivata*.

**LAKSHANA (Sign & Symptoms)[12]**

“वातपूर्णहतिस्पर्शः शोथ संधिगतेऽनिले ।  
प्रसारणाकुञ्चनयोः प्रवृत्तिश्च सवेदना” ॥ (च. चि.  
२८/३७)

According to Acharya Charaka the main symptoms of Sandhivata are Sandhi Shotha (swelling), Sandhi Shoola (joint pain), and Prasarana Akunchanyo Vedana (pain during flexion and extension).

## SIGN & SYMPTOMS

### Pain

- 1) Age > 45 yrs (often > 60)
- 2) Onset over months or years.
- 3) Variable or intermittent over time ('good days, bad days')
- 4) Mainly related to movement and weight-bearing, relieved by rest.
- 5) Only brief (< 15 mins) morning stiffness and brief (< 1 min) 'gelling' after rest.
- 6) Usually only one or a few joints painful (not multiple regional pain)
- 7) Muscle weakness, wasting
- 8) Pain may directly relate to the OA process through increased pressure in subchondral bone (mainly causing night pain), trabecular microfractures, capsular distension and low-grade synovitis, or may result from bursitis and enthesopathy secondary to altered joint mechanics.

- 9) For many people, functional restriction of the hands, knees or hips is an equal, if not greater, problem than pain. The clinical findings vary according to severity but are principally those of joint damage. The correlation between the presence of structural OA (clinical signs, radiographic changes) and pain and disability varies according to site. It is stronger at the hip than the knee, and poor at most small joints.
- 10) Risk factors for pain and disability may differ from those for structural change. At the knee, for example, reduced quadriceps muscle strength and adverse psychosocial factors (anxiety, depression) correlate more strongly with pain and disability than the degree of radiographic change.
- 11) OA is prevalent and commonly asymptomatic in middle-aged and older people, so the presence of OA may not necessarily be the explanation of a patient's problem. Because of their high prevalence, generalized OA, knee OA and hip OA will be considered individually [13].

**Table 1. Kellgren and Lawrence Grading for Osteoarthritis [14]**

<b>Grade 0</b>	Normal
<b>Grade 1</b>	Doubtful narrowing of joint space, possible osteophyte
<b>Grade 2</b>	Definite osteophyte, possible narrowing
<b>Grade 3</b>	Pain presents with activity, moderate multiple osteophytes, definite narrowing space, some sclerosis, possible deformity of bone end.
<b>Grade 4</b>	Pain is severe & widespread, large osteophytes, marked narrowing space, severe sclerosis, definite deformity of bone ends.

## INVESTIGATION

### Imaging Tests

- 1) **X-rays**-The X-ray of the affected joints reveal narrowing of the joint space, osteophyte formation, and the hands might show Heberdon's and Bouchard's nodes in the distal and proximal interphalangeal joints respectively.

- 2) **CT/Magnetic resonance imaging (MRI)**:- CT / MRI are useful to assess the spinal involvement.

### Laboratory Tests

- 1) **Blood Tests**- can be used for DD. In OA CBC, ESR, and CRP are in normal range.

2) **Joint Fluid Analysis**- tested for inflammation and to determine whether

pain is caused by gout or an infection rather than osteoarthritis.

**Table 2. Differential Diagnosis of Sandhivata[15]**

<i>Aamvata</i>	<i>Vatarakta</i>	<i>Sandhivata</i>	<i>Kroshtukashirsha</i>
Initially affects Smaller joints	Usually at first the great toe is affected	Start from great Bearing joints	Only knee joints are affected
Mild fever may be present	Fever may be present	Fever absent	Fever absent
Pain and swelling present in affected joint	Pain and swelling present in affected joint	Pain is present but may or may not present	Pain and swelling present over's the knee joint Typical jackal's head shaped
<i>Vata Kapha</i> dominant <i>Tridoshaja Vyadhi</i>	<i>Tridoshaja Vyadhi</i>	<i>Vata vyadhi</i>	<i>Vata dominant Tridoshaja Vyadhi</i>
<i>Dushya Rasa</i>	<i>Dushya Rakta</i>	<i>Dushya Rasa</i>	<i>Dushya Rakta</i>
No relief by Raktamokshana	Relief by Raktamokshana	No role of Raktamokshana	No role of Raktamokshana

#### COMPLICATION

The complication may be of the following:

- 1) Osteonecrosis
- 2) Chondrolysis
- 3) Carpal Tunnel Syndromes
- 4) Dislocation
- 5) Stress fracture
- 6) Bleeding in the joint
- 7) Loss of stability

- 2) *Samshaman*
- 3) *Samshodhana*

- 1) ***Nidana Parivarjanam* (Avoidance of causative factor)**

संक्षेपतः क्रियायोगो निदानपरिवर्जनम्॥ (सु. ३. १/२५)

#### TREATMENT OF SANDHIVATA (OA)

*Chikitsa* is mentioned as “*Vighatana of Samprapti*”

As per *Acharya Charaka* there are 2 types of pathogenesis in *Sandhivata*.

- (1) *Vataprakopa (Dhatu Kshaya or Svanidaanjanya)*
- (2) *Srotorodha*

So the aim of *Chikitsa* is to restoration of the *Dosha* equilibrium, correct the *Srotorodha* and improvement in metabolic activities in *Dhatu* level [16].

The cure of the disease can be achieved by-

- 1) *Nidana Parivarjanam*

*Nidana Parivarjan* is the first line of treatment. *Nidan Parivarjana*, healthy life style and diet is key factor in all conditions for the success in treatment [17].

- 2) ***Samshaman Chikitsa* (Conservative line of management)**

If a person is having very few symptoms of a disease, the intensity of the symptoms is not so severe and even strength of the person is less. Then only Conservative Line of Management (*Sanshaman Chikitsa*) is sufficient to treat such conditions [18].

*Srotoshodhan*, *Agnideepan* and managing bowel irregularities enhances the proper action of medicine and diet. Drugs which have properties of *Shothahara* (anti inflammatory), *Vatahara*, *Vedanasthapana*

(analgesic), and *Rasayana* (rejuvenative) Sandhivata. are useful to treat the condition of

**Table 3. Treatment Plan - A Srotorodhjanya Sandhivata**

Mild pain	Moderate pain	Severe pain
1) <i>Mahayogaraj/ Trayodasang Guggulu</i> - 2 tab TDS with luke warm water 2) <i>Maharasnadi Kwath</i> - 80 ml BD 3) <i>Trikatu Churna</i> - 2 gm BD after meal with luke warm water.	1) <i>Vatagajankusha Ras/ Vatavidhwansaka Ras</i> - 250 mg BD 2) <i>Maharasnadi/ Dashmuladi Kwath</i> - 80 ml BD 3) <i>Eranda Taila</i> - 10-15 ml H.S. with luke warm milk or added 1 TSF in <i>maharasnadi kwath</i> BD	1) <i>Vrihat Vatagajankusha Ras/ Mahavavidhwansaka Ras</i> 250 Mg + <i>Triphala Churna</i> 3 gm+ <i>suddha kupilu</i> - 50 mg, twice in a day with <i>madhu</i> / luke warm water. 2) <i>Yogaraja Guggulu</i> – 2 tab TDS with luke warm water/ <i>Maharasnadi Kwatha</i>

**Table 4. Treatment plan B Datukshaya Sandhivata**

Mild	Moderate	Severe
Reduce joint space, marginal osteophytes, crepitus	Osteophytes, subchondral sclerosis, osteoporosis, heavy crepitus.	Severe osteoporosis, osteophytes, bony cyst formation
1) <i>Aswagandha Churna</i> 3 gm+ <i>Muktasukti Bhasma</i> 250mg/ <i>Praval Pisti</i> 125mg/ <i>Godanti Bhasma</i> 500mg twice in a day with milk	1) <i>Aswagandha Churna</i> 3gm+ <i>Muktasukti Bhasma</i> 250mg/ <i>Praval Pisti</i> 125mg/ <i>Godanti Bhasma</i> 500mg twice in a day with milk. 2) Tab <i>Shallaki</i> 400/600mg- 2 tab BD or <i>Guggulu</i> preparation like <i>Trayodasang/ Yogaraja/ Lakshadi/ Abha/ Kaisora Guggulu</i> any one of BD/TDS with luke warm water can be given.	1) <i>Vrihat Vatachintamani Ras/ Vrihat Vatagajankush Ras/ Mahavatavidhwansaka Ras</i> (60mg – 125mg) twice in a day with milk/ <i>Vatanashaka kashaya</i> etc. 2) <i>Aswagandha Churna</i> 3gm+ <i>Muktasukti Bhasma</i> 250mg/ <i>Praval Pisti</i> 125mg/ <i>Godanti Bhasma</i> 500mg twice in a day with milk. 3) Tab. <i>Shallaki</i> 400/600 mg, 2 tab. BD or <i>Guggulu</i> any one of these in the dose of 2 tab BD/TDS with luke warm water can be given.

**Samshodhan Chikitsa (Elimination Therapy)**

Elimination of *Ama* (autotoxins & free radicals) and vitiated *Dosha* (body humor) through *Panchkarma* (the fivefold therapy).

If a patient is having almost all the symptoms of a disease, the severity of the symptoms is much powerful and even strength of the patient is good; ‘*Samshodhan Chikitsa*’ is to be selected for that person/patient.<sup>(19)</sup>

### **Abhyanga (Massage)**

*Abhyanga* is the manipulation of the body's soft tissues. *Abhyanga* techniques are commonly applied with hands, fingers, elbows, knees, forearms, feet. The purpose of *Abhyanga* is to treat the body stress or pain.

- 1) It improves blood circulation and promotes removal of toxins from the tissues
- 2) Relieves physical and mental fatigue
- 3) Reduces muscle stiffness and pain. Lubricates the joints and thus reduces pain and inflammation of joints & gives relief from various conditions like Rheumatoid Arthritis, Osteoarthritis, Paralysis, Sciatica, Back pain, cervical Spondylosis etc.

### **Swedana (Fomentation/ Sweating Therapy)**

*Swedana* is a pre *Panchakarma* procedure in which sweating is induced. After *Swedana* cellular metabolism improves and the cells get activated and flush the toxins away. *Swedana* done after *Abhyanga/ Snehana* enables free circulation in the joints reduce pain, stiffness and swelling, strengthens and rejuvenates the joints, eases movement.

There are many types of *Swedana* as explained in *Ayurvedic* texts for *Vatavyadhi* are

- 1) *Nadi sweda*
- 2) *Prastara sweda*
- 3) *Sankar sweda*
- 4) *Pratrapind Sweda* [20]

### **Upanaha Sweada**

*Upanaha Sweda* having almost all the properties of *Vatashamaka* by *Ushna* and *Snigdha Guna* and reduced pain swelling, joint stiffness. It combats with the properties of *Vata* like *Sheeta. Ruksha* and *laghu Guna*. Due to local rise of temperature metabolic waste are removed through increased blood circulation and *Sweda*.

### **Mriduvirechana**

Treatment of *Sandhivata* usually begins with a basic process like *Mriduvirechana*. It cleanses the body to restore patency of the *Srotas*, which improve the access of healing material as well as nourishment to the body components. In addition, this also helps in maintaining or restoring the optimum equilibrium in *Tridosha* [21].

*Eranda Taila* is indicated for *Mriduvirechana* in *Vatavyadhichikitsa*. The *Eranda Beeja*, having *Vibhedana* (purgative), *Srotoshodhana* (channel-cleansing), *Anulomana* (correct the Apana Vayu imbalance) actions, is used for *Mriduvirechana*. Due to the *Vatahara* action it is the best among the medicaments used for *Virechana* (purgative therapy).

### **Basti (Enema)**

*Pakwashaya* (lower gastrointestinal tract) is the site of action for *Basti karma*. It is the main site of *Vata dosha*. Hence *Basti* is mainly useful for the treatment of vitiated *Vata* [22]. It is convenient and comfortable in administration. It nourishes the body, promotes the strength, and cures *Vata*-related diseases and problems of muscles and bones. *Basti* is said as half of the treatment of *Ayurveda* [23]. Medicated oil and medicated decoction strengthen the joints and soft tissues and this therapy rejuvenates the tissues and eliminates the toxins from the body.

### **Janubasti**

In this procedure medicated oil poured into the pool like structure for a particular duration of time over the knee joint. It is beneficial in pain and swelling of the knee joint.

### **Agnikarma (cauterization)**

The *Ushna* (hot) *Guna* of *Agni* pacifies the *Shita* (cold) *Guna* of *Vata*, removes the *Avarana* effectively and stabilizes the movement of *Vata*, and reduces the joint

pain in the case of *Sandhivata*. *Acharya Charaka* mentioned that *Agni* is the best treatment for *Shoola* (pain). *Acharyas* have quoted that *Agnikarma* is superior in treating *Stambha* (stiffness). As per the modern medicine, therapeutic heat increases blood circulation at joints leads to vasodilatation, exudation of fluid, increase in white blood cells, antibodies and the proper nutrition of the tissue. And this improved circulation on the site help to flush away pain producing substances from affected site and ultimately reduces the local inflammation.

**Pathya-Apathya:** Diet and rehabilitation – improve life style [24]

#### **Pathya Aahara-Vihara**

*Godhuma, Mamsa, Raktashali, Godugdha, Ajadugdha, Ghrita, Taila, Draksha, Ama, Madhuka, Ushna Jala, Sura, Surasava, Madhura- Amla- Lavana Rasa Pradhana Ahara and Pathya Vihara* include exposure to sunlight for half an hour in midday, bathing with hot water, *Snehana, Swedana, Santarpana Karma, Brimhana karma* etc.

#### **Apathya Ahara** (Avoidable diet)

*Guru, Snigdha, Abhishyandi Ahara* like *Dadhi* (curd), dairy products, excessive intake of salt accelerates inflammation, grilled, fried frozen food also worse arthritis. Fast foods should be avoided as they cause oxidative stress.

#### **Apathya Vihara** (Avoidable Lifestyle)

*Chinta, Shok*, Sleeping in day time doing exercise after meal, walking late night, excessive walking, and wrong posture for long time, etc should be avoided.

### **DISCUSSION**

*Sandhivata* is very common form of arthritis. It shows a strong association with aging and is a main cause of pain and disability in elder person. As the degenerative phase of human body starts

after 40 years, more common in the age group of 40-60 years are seen in the study. Females are more affected from *Sandhivata* as in the menopausal phase rate of *Asthi dhatukshaya* is increased. *Sandhigata vata* is a *Nirupasthambhitha vata vyadhi* caused by *Dhathukshaya*. *Ruksha Guna* of *Vata* increases with age and *Dhatukshaya*, so *Snehana* is given to reduce the pain and brings back the *Mrudutva* (softness) of joints. *Snehana* and *Swedana* help to remove the stiffness and provide exhibility of *Sandhi*. *Basti* is the best treatment for *Vatavyadhi*. *Janubasti* reduces pain and swelling in knee joint's OA. *Agnikarma* removes the *Avarana* effectively and stabilizes the movement of *Vata*, and reduces the joint pain & stiffness in the case of *Sandhivata*. Oral medicines which have *Vatahara, Shothahara, Shoolhara, and Jadayatahara* properties are beneficial in *Vatavyadhi*.

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