

Role of Diet, Exercise and Yogic Practice Sinprevention and Management of Sandhigataavata (Osteoarthritis)

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Abstract: *Osteoarthritis (OA) is a degenerative disease and leading cause of chronic disability that involves synovial joint. It has been estimated that around 9.6% of men and 18% of women ≥ 60 years have OA with clinical symptoms all over the world. The disease generally starts in the 2nd and 3rd decades although clinical features are not apparent but it has been found to be common at the age of 70. Almost all persons by age 40 have some pathologic change in weight bearing joint. 25% females and 16% males have symptomatic OA. The clinical features of OA resemble with Sandhigata Vata described in Ayurvedic classical texts, which is a disease of Sandhi (joint) characterized by symptoms of Sandhishula (pain), Sandhishotha (swelling) and Akunchana Prasarana Pravritti Vedana (pain on flexion and extension of the joint) and in the later stage Hanti Sandhigatah (diminution of the movements at joints).OA is an incurable disease. Experts suggest non drug approaches like exercise, weight loss and physical therapy along with drug therapy.*

Ayurveda is the science of life having holistic approach that considers the importance of physical, mental, social as well as spiritual aspects in the prevention and management of diseases. Diseases result from the disturbance in homeostasis of Tridosha (Vata, Pitta, Kapha) which are affected by dietetic factors, lifestyle as well as environmental factors. Chronic and non- communicable diseases such as OA are preventable with changes in diet, lifestyle and performing regular exercise and Yoga. Ayurveda emphasizes regulation of Ahara -Vihar in the form of Ashtaharvidhi Visheshayatanani, Dwadasha Ashanapravicharana and Dinacharya. Regular practice of various Yogic practices such as Kapalbhathi, Nadishodhana Pranayama, Bhramari, Konasana, Uttanapadasana, Dhanurasana and Ushtrasana are effective in prevention as well as management of arthritis by increasing flexibility, reducing pain, improving function and lowering stress. This article will deal in length about role of diet, exercise and yogic practices in prevention and management of Sandhigatavata (osteoarthritis).

Short Running Title: *Management of Sandhigata Vata by diet, exercise and Yogic practices*

Keywords: *Prevention, diet, exercise, Sandhigata Vata, Yoga*

1. INTRODUCTION

Osteoarthritis (OA) is a predominantly degenerative disease that involves peripheral joints in which there is damage to cartilage as well as overgrowth of the bone .¹The prevalence of OA has been found to increase with the advancing age and possibility of women being affected by the disease is greater than men.. It affects the hips and knees more often than other joints. OA is also a leading cause of operations requiring replacement of knee joints with artificial ones.²

It has been observed that around 9.6% of men and 18% of women ≥ 60 years have OA with clinical symptoms all over the world. The disease generally starts at the age of 20 or 30 although clinical features are not apparent but it has been found to be common at the age of 70. Pathologic changes may be seen in weight bearing joints by the age of 40.³ Osteoarthritis simulates with *Sandhigata Vata* described in *Ayurvedic* classical texts, which is a disease of *Sandhi* (joint) characterized by symptoms of *Sandhishula* (pain), *Sandhishotha* (swelling) and *Akunchana Prasarana Pravritti Vedana* (pain on flexion and extension of the joint and in the later stage *Hanti Sandhigatah* (diminution of the movements at joints).⁴ At present there are three groups of treatment measures available for OA : medicinal, surgical, and non-medicinal. Surgery is the last measure where there is no scope for management by medicines. Medicinal therapy helps to reduce pain and thus improves the quality of life. Better response can be obtained by simultaneously using small quantity of medicine in combination with other measures like exercise, weight loss and physical therapy which help to avoid

toxicity of drugs. Proper dietetic practices, lifestyle changes and adopting the daily and seasonal regimes illustrated in *Ayurvedic* texts and suitable *Yogic* practices have been found to be highly effective non –medicinal measures for *Sandhigata Vata* (OA).

2. NIDANA (ETIOLOGY) OF SANDHIGATA VATA (OSTEOARTHRITIS)

In classical *Ayurvedic* texts no specific *Nidana* has been explained for *Sandhigata Vata*.

Therefore, general *hetu* of *Vata vyadhi* can be considered as etiological factors responsible for causing *Sandhigata Vata*.

Common *Hetus* (etiological factors) of *Vatavyadhi*, which are mentioned by *Acharya Charaka* are as below.

Aharaja : *Atiruksha* (*Excessive dry*) , *Atisheeta* (*cold*) , *Atialpa* (*very less quantity*) , *Atilaghu* (*very light*) , *Abhojan* (*no food intake*)

Viharaja : *Atiprajagaran* (*no sleep*) , *Divasvapna* (*sleeping in day*) , *Ativyavaya* (*excess sexual act*) , *Vegasandharan* (*stopping natural urges*) , *Plavana* (*swimming*) , *Atiadhva* (*excess walk*) , *Ativyayam* (*excess exercise*)

Manas : *Atichinta* (*excess anxiety*) , *Atishoka* (*excess grief*) , *Atikrodha* (*excess anger*) , *Atibhaya*. (*fear*)

Others: *Dhatunam Sankshyad*,, *Rogatikarshanad* (*due to prolonged diseases*) , *Marmaghat* (*trauma to vital parts*).⁵

3. RISK FACTORS FOR OSTEOARTHRITIS

Exact etiology of OA is not clear .The incidence of the disease increases with the age. The risk factors for OA of the knees, hips and hands have been depicted in the table as under:

Table1. Risk Factors for Osteoarthritis⁶

Risk factor	
Age	Increases with age ▪ Maximum incidence after the age of 80
Trauma	▪ joint fractures and injuries lead to increased risk for OA ▪
Occupation	▪ Incidence is more in persons doing heavy physical work like labourers
Exercise	▪ OA is common in sports persons or those doing aggressive exercise
Gender and Ethnicity	▪ Men under the age of 50 ▪ Women after the age of menopause ▪
Genetics	▪ Incidence have been found to be increased in children of parents with early onset OA
Obesity	▪ Increases the risk of OA
Diet	▪ Increased risk in people with lower vitamin C and D blood levels ▪

The number of people suffering from OA burden will be greatest in developing countries due to increase in life expectancy but having poor availability of health services.^{7,8}

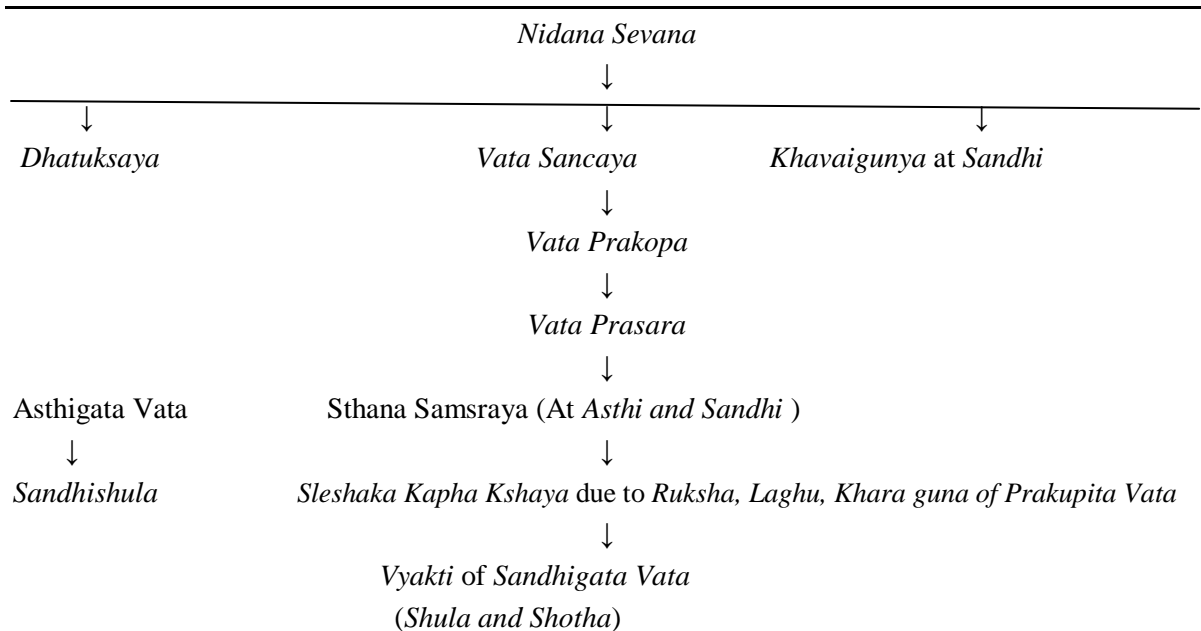
4. SAMPRAPTI (PATHOGENESIS) OF SANDHIGATA VATA (OSTEOARTHRITIS)

Specific *Samprapti* has not been mentioned for *Sandhigata Vata*. So, it can be said that *Samprapti* of *Sandhigata Vata* is same as that of general *Samprapti* of *Vatavyadhi*. *Charaka* has described the *Samprapti* – *Nidanasevana* aggravates *Vata* and this *Prakupita Vata* gets accumulated in *Rikta srotas*; means, where free space exists for its lodgement and gives rise to generalized and localized diseases.⁹

5. SAMPRAPTI CHAKRA (CYCLE OF PATHOGENESIS OF SANDHIGATA VATA)

In the course of abelow pathogenesis the patient may develop clinical features of *Sandhigata Vata* (Osteoarthritis) as follows¹⁰:
“*kwykVksikS djksfr p A ¼lq - fu- 1@27½* When vitiated *Vata Dosha* gets *Sthana Samsraya* in *Sandhi* (joint), it causes pain and inflammation

in the joints and in later stages dislocation and loss of function of the joints.



Pain during flexion and extension and *Sotha* which appears like a bag filled with air on palpation are the main *Laksanas* of *Sandhigata Vata*, described by *Acarya* Charaka. Shusruta has added one more *Laksana* as “*Hanti Sandhin*”. Gayadasa and Dalhana commented on this word that there is inability of flexion and extension of *Sandhi*.¹¹ Acharya Madhavakara has given another symptom ‘*Atopa*’.¹² The meaning of the word ‘*Atopa*’ appears to be *Sandhisputana* or crepitus of the joints.

6. PREVENTION OF SANDHIGATA VATA (OSTEOATHRITIS)

The ultimate aim of *Ayurveda* is preservation of health and management of the diseased people¹³. *Ayurveda* gives special attention to individual peculiarities such as *Prakriti*, *Satmya*, *Sara*, *Samhanana* and so on while dealing with the patients.¹⁴

According to *Ayurveda*, there are three important factors for maintenance of health called as *Trayopstambha* (three sub pillars of life) viz. i) *Ahar*, i.e. food habits ii) *Vihar*, i.e. appropriate lifestyle and iii) *Brahmacharya*, i.e. control of sexual desire.¹⁵ *Ayurveda* advocates specific rules for taking diet such as *Ashtaharvidhi Visheshayatanani*¹⁶ and *Dwadasha Ashanapravicharana*¹⁷ and also specific regimens for regulating lifestyle such as *Dinacharya*¹⁸, *Ratricharya*¹⁹, *Ritucharya*²⁰ and *Sadvritta*²¹.

Sandhigatavata is a *Vatika* disease caused mainly due to *Dhatukshya* or *Avarana*, so general treatment of *Vatavyadhi* can be adopted like *Snehana*, *Svedana*, *Mridu Samshodhana*, *Basti* and *Vatahara Aushadha*, *Ahara* and *Vihara* may also be applicable in *Sandhigatavata*. As a specific line of treatment, *Acharya Sushruta*²² and *Acharya Vagbhatta*^{23,24} have described *Snehana*, *Upanaha*, *Agnikarma*, *Bandhana*, *Mardana* and *Svedana* for the treatment of *Sandhigatavata*.

The measures for preventing OA are as follows changes.²⁵

1. *Primary prevention*. The measures for primary prevention include weight reduction and injury prevention. Obesity is a predisposing factor for OA. Therefore, reducing weight decreases the risk of OA.
2. *Secondary prevention*. It includes early diagnosis and treatment which is difficult for OA due to lack of effective biomarkers to determine the progression of the disease.
3. *Tertiary prevention*. It involves measures to prevent complications of a disease in order to reduce pain and improve the quality of life.²⁶

7. ROLE OF AHAR (DIET) AND VIHAR (LIFESTYLE) IN PREVENTION AND MANAGEMENT OF SANDHIGATA VATA (OSTEOATHRITIS)

Ahar (diet) and *Vihar* (lifestyle) are the key modalities of prevention and management of diseases in *Ayurveda*. The importance of diet can be understood with the fact that it has been called as *Mahabhaishajya* (the super medicine) in the *Kashyap Samhita*.²⁷

In Ayurveda , it has been clearly mentioned that food should be taken keeping in mind the rule that one part of the stomach should be filled up with solid food, the second part with liquids and the third part should be left empty for proper action of *Doshas*.²⁸The entire benefit can not be obtained by taking food simply on the basis of the quantity of intake .There are eight factor – *Prakriti, Karana, Samyoga, Rashi, Desh, Kala, Upayoga Samstha* and *Upayokta* which determine the utility of food and are jointly responsible for bringing about the requisite benefits.²⁹Specific *Pathya* and *Apathya* of *Sandhigatavata* are not mentioned in classical texts. But, being a *Vata Vyadhi*, the *Pathya -Apathya* of general *Vatavyadhi* may be adopted.³⁰

Pathya Ahara (Beneficial dietary factors)

1. <i>Annavarga</i> (class of grains)	<i>Godhum</i> (<i>Triticum aestivum</i>), <i>Masha</i> (<i>Vigna mungo</i>), <i>Raktashali</i> (<i>Oriza puntata</i>)
2. <i>Dugdhavarga</i> (class of milk)	<i>Gau</i> (Cow)- <i>Aja</i> (Goat) <i>Dugdha, Ghrita</i>
3. <i>Phalavarga</i> (class of fruits)	<i>Draksha</i> (<i>Vitis vinifera</i>), <i>Badara</i> (<i>Zizyphus jujuba</i>), <i>Amra Mangifera indica</i> , <i>Madhuk</i> (<i>Madhuka indica</i>)
4. <i>Jalavarga</i> (class of water)	<i>Ushna Jala</i> (warm water), <i>Shritashita Jala</i> (water cooled after boiling)
5. <i>Madyavarga</i> (class of wines)	<i>Sura, Madira, Surasava, Amlakanjika</i> (different types of preparations produced by fermentaion in Ayurveda)
6. <i>Mamsavarga</i> (class of fleshs)	<i>Kukkuta</i> , <i>Mayura, Chataka, Tittir, Nakra, Matsya,Varah, Jalachara Mamsa</i> (meats of birds and other animals)
7. <i>Mutravarga</i> (class of urine)	<i>Gau</i> , (cow) <i>Ashva</i> (horse), <i>Hasti</i> (elephant) <i>Mutra</i>
8. <i>Rasavarga</i> (class of taste)	<i>Madhura</i> (sweet), <i>Amla</i> (sour), <i>Lavana</i> (salt)
9. <i>Shakavarga</i> (class of vegetables)	<i>Jivanti</i> (<i>Leptadenia reticulata</i>), <i>Shigru</i> (<i>Moringa oleifera</i>), <i>Rasona</i> (<i>Allium sativum</i>), <i>Patola</i> (<i>Trichosanthes dioica</i>)
10. <i>Snehavarga</i> (class of fat)	<i>Taila, Ghrita</i> , <i>Vasa</i> (animal fat) , <i>Majja</i> (bone marrow)

7.1. Pathya Vihara (Beneficial Lifestyle)

Atapa Sevana (exposure to Sun rays, *Mridushayya* (Soft bed), *Ushnodaka Snana* (bath with warm water)

7.2. Pathya Aushadha (Beneficial medicines)

Rasna (*Pluchea lanceolata*), *Sunthi* (*Zingiber officinale*), *Bilva* (*Aeglae marmelos*) ,*Gokshura* (*Tribulus terrestris*), *Rasona* (*Allium sativum*), *Palandu* (*Allium cepa*)

7.3. Apathya Ahara Varga Dravya (Avoidable dietary factors)

- *Annavarga -Yava* (*Hordeum vulgare*),*Chanaka* (*Cicer aeritinum*)
- *Dugdhavarga- Gadarbha Dugdha* (jennet milk)
- *Ikshuvarga- Madhu* (honey)
- *Jalavarga –Nadi* (river),*samudra* (sea), *Tadagasya* (tank) *jala* (water), *Shita* (cold) *jala*, *Dushita* (contaminated) *jala*
- *Madyavarga – Ati madya pana -Naveen Madya* (Excessive use of Alcohol and use of freshly prepared alcohol
- *Mamsavarga- Shushka Mamsa* (dry meat)etc.
- *Mutravarga –Ajamutram* (Urine of goat)
- *Phalavarga- Jambu* (*Syzizium cumini*)
- *Rasavarga –Katu* (pngent), *Tikta* (bitter), *Kasaya* (astringent) *Rasa*
- *Shakavarga- Udumbara* (*Ficus glomerata*)

7.4. Apathya Vihara (avoidable lifestyle)

Chinta (anxiety), *Jagarana* (awakened state), *Vega Sandharana* (control of natural urges), *Shrama* (fatigue due to physical work), *Anashana* (taking no food), *Vyavaya* (sexual act), *Vyayama* (exercise), *Pravata* (wind), *Chankramana* (mild exercise), *Yana Gamana* (travelling)

7.5. Apathya Aushadha (medicines to be avoided): *Vamana (emesis) and Raktamokshana (blood letting)*

8. ROLE OF VYAYAMA (EXERCISE) IN PREVENTION AND MANAGEMENT OF SANDHIGATA VATA (OSTEOARTHRITIS)

Vyayama has been defined as body activity in appropriate amount which is suitable as per requirement of a person and provides strength and stability to the body.³¹ *Vyayama* performed in required amount and for suitable time period produces lightness, stability, efficiency and tolerance in the body and also causes *Kshya* of vitiated *Dosha* as well as increase in functioning of *Agni*.³²

Exercise is contraindicated for persons who are emaciated due to excessive sexual activity, weight lifting and by traveling on foot and for those who are in grip of any grief, fear, exhaustion and for children, for the old persons and for persons having *Vatika* constitution and profession of speaking too much. One should not do exercise while he is hungry and thirsty also.³³

Exercise is highly beneficial in OA. It not only increases muscle strength and endurance but also increases joint flexibility and mobility. Researches have proved that exercise as well as physical therapy reduces pain and disability in persons suffering from hip and knee OA.^{34,35}

Exercise conditions the skeletal muscles which decreases oxygen consumption for the same workload. It also lowers heart rate for any level of exertion.³⁶

Stress can be reduced regulating daily regimen, proper exercise and *Yogic* practices along with meditation.³⁷

Bicycling and swimming are safe exercises for patients of OA as these exercises give the least body weight on the joints.³⁸

8.1. Role of Yogic Practices in Prevention and Management of Sandhigata Vata (Osteoarthritis)

Yoga is an ancient Indian practice of exercises and breathing techniques which has holistic effect on body and mind. Studies have revealed that regular practice of Yoga decreases joint pain and increases joint flexibility along with lowering of stress and tension along with sound sleep. There are different components of Yoga but the common *Yogic* practices include *Asanas* (body poses) and *Pranayama* (breathing practices) *Dhyana* (meditation).

Regular practice of various *Yogic* practices such as *Kapalbhati*, *Nadishodhana Pranayama*, *Bhramari*, *Konasana*, *Uttanapadasana*, *Dhanurasana*, *Ushtrasana* and so on are effective in prevention as well as management of arthritis by increasing flexibility, reducing pain, improving function and lowering stress.

In a study by Kawasaki *et al.* intra-articular injection was compared with home exercise protocol and it was observed that both interventions have similar effects on joint pain reduction and improvement of functions in cases of knee OA.³⁹

Bukowski *et al.*, concluded that *Yogic* practices improve joint flexibility, increase strength and enhance quality of life in patients of knee osteoarthritis. *Hatha* *Yogic* practices reduce pain and increase routine and spare time activities in cases of OA.⁴⁰

Varios scientific studies all over the world have shown that Yoga is a safe and highly effective way to enhance physical efficiency and mental health. Yoga has all the benefits of other forms of exercises like increasing muscle strength and flexibility, increasing respiratory tolerance and promotion of balance^{41, 42}. Yoga increases overall body energy. Yoga enhances mental energy and induces positive feelings like alertness and enthusiasm and reduces negative feelings like excitability, anxiety, and aggressiveness^{43, 44}. Thus, physical and mental benefits of Yoga are helpful to improve living standard of persons suffering from chronic ailments like osteoarthritis..

9. DISCUSSION

Modern medical science is materialistic having high dependence on pharmacological intervention. On the other hand, *Ayurveda* being a holistic system providing equal importance to physical, mental and spiritual aspects. With the advancement of the modern medicine, the potent antibiotics have helped to manage various types of infections and control of epidemics. There is vast development in

the field of diagnostic techniques and surgical interventions along with molecular biology and genetic engineering. But all these depend on use of drugs which have furious side effects along with their benefits. The incidence of chronic and degenerative diseases is increasing very fast and there effective management is still far from reach. Their management depends on continuous intake of drugs having harmful side effects . In such situation the only option remains is the primordial and primary prevention of chronic and non communicable diseases with proper implementation of dietary and lifestyle practices.

Ayurveda has vast scope in this area. *Ayurveda* advocates fault diet and lifestyle as one of the etiological factors of the diseases. Proper use of diet and elimination of faulty dietary and lifestyle factors provide better management option to the patients of chronic ailments. *Ayurveda* describes rules for taking meals for healthy as well as diseased persons. An ideal diet is balanced and easily digestible .Besides being pleasing, it should be fresh and taken in appropriate quantity with full piece of mind .⁴⁵

Researches reveal that Yoga is a highly beneficial tool for enhancing physical efficiency and mental health .Regular use of Yogic practices help to decrease joint pain, increase joint flexibility and prevent from harmful effects of stress.

10. CONCLUSION

With the rising elderly population due to better availability of medical facilities, there in increase in the cases of OA and its management is a challenge for the medical experts and a cure for the disease is still awaited. *Ayurveda* advocates proper use of diet and regulation of lifestyle from very early life. If followed as per instructions various *Ayurvedic* measures can prevent OA in primordial and primary stages and progress of the disease to later stages can be stopped. It has also been observed that following proper Yogic practices it is possible to increase physical activity and reduce stress.

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