



Review Article

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AYURVEDIC APPROACH IN THE MANAGEMENT OF SANDHIGATAVATA: A CRITICAL REVIEW

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ABSTRACT

Osteoarthritis (OA) is leading debilitating disease. There is rapid increasing OA in elderly population in Asian countries. It is 2nd most common rheumatologic problem and is most common joint disorder with prevalence of 22% to 39% of Indian population. The Community oriented program for control of rheumatic diseases (COPCORD) study also showed higher prevalence in urban as compared to rural population. Severity of the disease rises with age. Although it affects all the joints; hip, knee and hand are the common one to get affected. With better awareness and medical facility available, the increased life expectancy is increasing the burden of disease. There are many risk factors attributed to osteoarthritis, but underlying cause and pathogenesis still remains unclear producing hindrance in prevention and treatment of disease. Ayurveda, the Indian traditional system of medicine names Sandhigatavata to this clinical condition and explicates its causes, pathogenesis, sign & symptoms, prevention and treatment; providing remarkable aids to the debilitating condition of diseased and reduces the morbidity. Swelling and pain in extension and contraction are the leading presentation of the Sandhigatavata, grouped under Vata vyadhi. Though the disease appears simple, its management needs critical analysis of disease condition viz. association of dosha and dushya, aashaya-ashrayibhava (mutual interdependence) and type of pathogenesis (upstambhita or nirupstambhita). Avoiding unwholesome in view of prakruti of patient is the basis of the prevention of the disease.

Keywords: Osteoarthritis, Sandhigatavata, Vata vyadhi, Aashaya-ashrayibhava, Upstambhita, Nirupstambhita.

INTRODUCTION

Osteoarthritis (OA) is a common cause of disability in older adults. OA is a chronic degenerative disorder of multifactorial aetiology characterized by the deterioration of articular cartilage, hypertrophy of the bone at the margins, subchondral sclerosis and range of biochemical and morphological alterations of the synovial membrane and joint capsule which results in bones rubbing together and creating stiffness, pain, and impaired movement¹. The disease affects the joints in the knees, hands, hip, feet, spine and shoulder joints. The prevalence of OA is increasing due to increase in related risk factors. Costs associated with OA include costs for adaptive aids and devices, medicines, surgery, and time off at work². Pathological changes in the late stage of OA include softening, ulceration, and focal disintegration of the articular cartilage.

PREVALENCE

It is 2nd most common rheumatologic problem and is the most frequent joint disorder with prevalence of 22% to 39% in India. The incidence of hand, hip and knee OA increases with age. Knee OA is most common among all joints and has approximately doubled its prevalence because of recent changes in lifestyle. Women have higher OA rates than men, especially around menopause (45-50 years). The prevalence of OA was found higher in lower socio-economic perimenopausal women than higher socio-economic population. Over 65 years of age 70% women shows radiological evidence of OA and 45% shows symptoms of OA³.

Most of the time risk factors or causative means attributed to osteoarthritis are unknown. It is mainly related to ageing, but

metabolic, genetic, chemical and mechanical factors may also contribute in the genesis of osteoarthritis⁴.

Cartilage, subchondral bone and periarticular muscles are shock absorber tissues. OA develops because of: (1) Excessive loading of the joint causes the tissues to fail, or (2) The material properties of the cartilage or bone are inferior.

Mechanical injury, the lysosomal enzymes and MMPs (Matrix metallo-proteinases) are responsible for the loss of cartilage matrix in OA (stimulated by IL-1 or mechanical stimuli). Major changes in OA are seen in load-bearing joints. In the early stage the cartilage is thicker; progressively, the joint surface thins, the cartilage softens and vertical clefts develop (fibrillation). Appositional bone growth leads to the bony "sclerosis"; bone under cartilage appears ivory (eburnation) and osteophytes (spurs) are seen as a result of growth of cartilage and bones. The chondrocytes undergo active cell division producing increased quantities of DNA, RNA, Collagen, PG, and non-collagenous proteins. This lead to an increase in PG concentration with thickening of the cartilage and a stage of homeostasis referred to as "compensated" OA for years. The repair tissues, often does not hold up well under mechanical stresses as normal hyaline cartilage, and eventually, the rate of PG synthesis falls off and "end stage" OA develops, with full thickness loss of cartilage⁵.

There are many predisposing factors viz. obesity (increased BMI), vascular disease, genetic factors, osteoporosis, sarcopenia, sedentary lifestyle, damage to joint tissues, other diseases and impairment in the damage repair process.

OA is age related, predominant in women generally around menopause⁶. Obesity (increased BMI) and rise in longevity are associated with increase in prevalence of knee OA. But the

underlying causes of high prevalence of knee OA remains unclear producing hindrance in treatment of disease.

Vascular disease may induce venous occlusion and stasis; leading to reduction in blood flow to subchondral bone and accelerating progression of OA. Patients being prescribed with NSAIDs are more prone to cardiovascular disease. Alleles of genes, such as GDFS have been shown to influence Knee OA and have approximately doubled its prevalence⁷.

Negative association is observed between increase BMD & OA. Sarcopenia (quadriceps weakness) shows association with knee OA. However, vice versa is not true i.e. greater muscle strength is not always protective for OA.

Sedentary lifestyle and physical inactivity are another possibility that may result in thinner cartilage and weaker muscles. Diseases like hypertension, atherosclerotic heart disease, Type 2 diabetes, metabolic syndrome and obesity showing a common pathogenic mechanism among metabolic abnormalities and systemic inflammation are strongly associated with OA.

Traumatic injury like meniscal and cruciate tears, fractures and dislocations of joints increases the risk of OA development. Monotonous motions like prolonged squatting on joints, kneeling, climbing and heavy weight lifting stresses the larger joints and is also associated with high risk of developing OA. Altered load bearing in joints generated by improper walking more frequently on hard pavements or with certain forms of footwear might be factors.

OA causes burden to the population in the form of pain, stiffness, disability requiring surgical intervention and affecting ability to perform daily work. It also has deleterious psychological effects in later stage of OA.

DIAGNOSIS

Osteoarthritis is diagnosed by physical examination, x-ray, MRI scan and arthroscopy. However, none of these tools are sensitive and specific enough. Biomarkers for OA that can be used in clinical practice are not available.

CLASSIFICATION

OA is primary when related with aging, localized, generalised and erosive; or secondary when caused by other diseased conditions. OA is most widely assessed using the Kellgren and Lawrence (K&L) score. It was accepted by WHO in 1961 as the standard for epidemiological studies on OA. The scores are graded from 0-4 as:

- Grade 0: No radiographic features of OA are present.
- Grade 1: Doubtful joint space narrowing (JSN) and possible osteophytic lipping.
- Grade 2: Definite osteophytes and possible JSN on antero-posterior weight bearing radiograph.
- Grade 3: Multiple osteophytes, definite JSN, sclerosis, possible bony deformity.
- Grade 4: Large osteophytes, marked JSN, severe sclerosis and definite bony deformity⁸.

American college of rheumatology (ACR) has devised diagnostic and guidelines medical management⁹.

Community oriented program for control of rheumatic diseases (COPCORD) is primarily an International League of

Associations for Rheumatology (ILAR) was launched in collaboration with WHO with a focus to measure and evaluate 'pain and disability' in rheumatic disorders¹⁰. The WHO-ILAR (COPCORD) advocates screening of musculoskeletal complaints in the community by the COPCORD Core Questionnaire (CCQ) as a diagnostic tool¹¹.

Though there are palliative medicines and different aids available that can relieve pain and improve quality of life. There is no medicine that can halt or reverse the onset of OA.

The American college of rheumatology (ACR) stated that Ayurveda offers "safe and effective treatment alternatives" for OA. Ayurveda has many therapies to offer in the treatment of osteoarthritis.

Ayurveda names Sandhigatavata to this clinical condition and explains aetiology as overindulgence in dry, cold, scanty, light digestible eatables, sexual intercourse and excessive night vigils, panchakarma (improper therapeutic managements), excessive diminution of doshas, bloodletting, fasting, swimming, wayfaring, over exercises, wasting of body tissues, worries, grief, debility due to protracted diseases, suppression of natural urges, production of amadosha (intermediary metabolites), injury, fasting, injury to vital organs, riding fast on elephants, camel, horse cart or falling during ride may aggravate vata, which indeed occupies vacant channels of body; thereby producing various disease (may be generalised or localized).

Vata gets vitiated due to wasting of dhatus or obstruction in passage by other doshas (pitta and kapha). Due to Subtleness, vata provokes the other doshas. Aggravated vata carries them to different places, produces different disorders and dries-up rasa etc¹².

PATHOGENESIS

Vata gets aggravated by excessive intake of aahar, vihara (causative factors) and causes dhatukshaya (depletion of tissues). These vacated channels created by depletion of tissues are occupied by aggravated vata or by other doshas, producing various diseases on the basis of aashraya-aashrayibhav (mutual interdependence)¹³.

CLINICAL FEATURES OF VATA VYADHI

Contractures of small joints, stiffness and fracture like pain in bones and joints, horripilation, delirium, stiffness in hand, back and head, lameness, crippledness and humpedness, wasting of body, sleeplessness, loss of pregnancy, sperm or ovum, pulsation or numbness of the organ, pain in temporal & frontal region, loss of smelling sensation, deformity in eye, clavicular region and neck, tearing and pricking pain, anorexia, convulsion and different deformity are produced by vitiated vata based on accumulation in different organs thereby producing specific disease like Sandhigatavata (if gets located in joints).

If vitiated vata gets located in asthi and majja (bone and marrow) there is breaking pain in bones and small joints, pain in joints, wasting of muscles, depletion of strength, sleeplessness and persistent pain.

Vata when covered with pitta, causes burning sensation, pyrexia and giddiness. If covered with kapha produces feeling of coldness, swelling and heaviness. If covered with rakta (blood), pricking pain, aversion to touch, numbness and other disorders of pitta are produced¹⁴.

Heaviness in body, stiffness in bones and small joints and restriction in movements are the symptoms of vyana vayu covered with kapha.

PRODROMAL SIGN

The prodromal features of the vata vyadhi are not specific. It is characterized by unmanifested symptoms.

SIGN & SYMPTOMS

Symptoms of vata vyadhi becomes significant when the disease manifests itself in later stage and there is feeling of lightness and the symptoms subsides when the bout of disease is over¹⁵. If vata gets seated in sandhi (joints), it causes swelling like air filled bladder in touch, and there is pain in extension and contraction¹⁶ and loss of functions of joints.

MANAGEMENT

If vata alone is aggravated i.e. nirupstambhita (not covered with other doshas); clarified butter, muscle fat, oil and marrow is given orally (snehapana). If the patient is uneasy because of snehapana (uncting substances) he should be uncted again after some interval with milk, vegetable, soup of domestic, aquatic meat mixed with uncting substance, rice cooked in milk, gruel with sour and salt, anuvasana basti (unctuous enema), nasal drops, heavy (saturating) food and when uncted well he should be sudated with unctuous sudated by means of nadi (tube), prastara (hot bed) and sankara (mixed) etc. according to need¹⁷.

If vata gets aggravated in association with other doshas the patient should be evacuated with mild unctuous emetics and purgatives. The patient should take clarified butter processed with *Symplocos racemosa* or *Euphorbia tirucallior* castor oil with milk to detoxify them.

In case of accumulation of excrement due to fatty, sour, salty, hot food (due to aggravation of pitta and kapha), there is obstruction of vata in channels. Hence vata should be carminated.

If the patient is weak and unfit for purgation, he should be given niruha basti (non-unctuous enema) made up of deepana and pachana (appetisers or digestive) drugs and food including them. Deformity in body due to vata is managed with poultices (upanaha) with vata-alleviating drugs. Contracture in body is massaged with oil processed with black gram and rock salt. Nasal drops (nasya) and post-meal intake of clarified butter and oil processed in vata pacifying drugs are beneficial if vata located in arms and head. Vata if located below navel region is pacified with enema and nasal drops with pressed juice¹⁸.

Snehana (oleation) and swedana (sudation), vamana (mild emetics) and virechana (purgatives), sweet, sour and salty food, hot in potency, abhyanga (external application of oil), mardana (rubbing), veshtana (tight bandage), trasana (sudden threatening), alcohol prepared from paishtika (all-purpose flour) and guda (jaggery), unctuous and hot enema. Different oleating substances are processed with agnidipana (digestive) drugs. Especially unctuous enema with the mutton soup¹⁹.

Vata if located in ligaments, joints and bones, unction, poultice, cauterization, bandaging and rubbing should be carefully applied wherever needed.

Vata if afflicting whole body is managed with methods of sudation such as avagaha, kutti, karsu and prastara (dipping),

massage enema and bloodletting by the physician as per his wisdom. Vata if localised bloodletting be done with horns.

Kakolyadi group and vata alleviating drugs combined with all sour substances, marshy and aquatic meat and all fats lukewarm and predominantly salty. This should be used as poultice for those suffering from vatika disorders.

Bhadradarvadi and Vidarigandhadi groups combined with all sour substances such as vinegar, sour gruel, wine, curd or pomegranate may be used for internal as well as for external use²⁰.

Shirobasti (unction of head), unctuous smoking, gargle with lukewarm unctuous, meat soups, milk, meat, fatty substances; bath with tepid water, gentle pressing of body, *Crocus sativa*, *Aquillaria agallocha*, *Cinnamomum tamala*, *Saussurea lappa*, *Elettaria cardamomum*, *Valeriana officinalis*, heavy clothing made of silk, wool & cotton; windless room, with sufficient sunlight, underground chambers, soft bed, exposure to fire, brahamacharya (celibacy) are useful for those suffering from vatika disorders (vata vyadhi).

PATHYA (WHOLESOME)

Clarified butter, oil, fat and marrow, massage and enema, unctuous, fomentations, wind-free place, wrapping self in heavy cloth, meat soups, green gram soup, wheat flour, boiled vegetables and rice, milk, sweet, sour and salty edibles and corpulent substance is useful for the patients of vatika disorders²¹. Milk processed with panchamoola decoction, meat-soup, soured with fruits (pomegranate etc.) or unctuous soup of cereals. These are wholesome for those suffering from disorders of vata. They were instructed not to take sour, fermented, or spicy food and to avoid heavy work, night vigils and day time sleep.

DISCUSSION

Plenty of aetiology has been ascribed to Vata Vyadhi which can be summarised as faulty food habits, faulty life styles, improper therapeutic management, over exertion, injury and mental stress. Table 1 elaborates different causes of Vata aggravation.

A clinical presentation of Sandhigatavata depends on type of vata involved and association with other doshas. Along with its specific sign mentioned as swelling like air filled bladder and pain in extension and contraction and loss of function. If associated with pitta it causes burning sensation, pyrexia and giddiness; with kapha it causes coldness, swelling and heaviness and with rakta there is prickly pain, aversion to touch and numbness. Similar kind of presentation is observed when vyana vayu gets covered by kapha producing stiffness in bones and small joints. Pathogenesis of the disease is shown in Chart 1.

Treatment depends on independency of vata doshas or association of other doshas, location of vata in different part of body viz. in arm and head, below umbilical region, specific tissues and whole body or localised.

Nirupstambhita: Snehapana, unctuous enema, Nasal drop, saturating food and Sudation (snigdhaswedan, nadisweda, prastarasweda, sankarasweda). External and internal uncting is advised in nirupstambhita Sandhigatavata. Uncting material quickly nourishes the dried body tissues and promotes strength and digestive power and corpulence²². Yogaraj guggulu, Mahayogaraja guggulu, Ashwagandharishta, Shatavarikalpa, Brihatavata chintamani rasa, Trailokya chintamani rasa and Suvarnasamirpannag rasa, Tryodashanga guggulu²³ and Panchatiktaghrita guggulu²⁴ are useful.

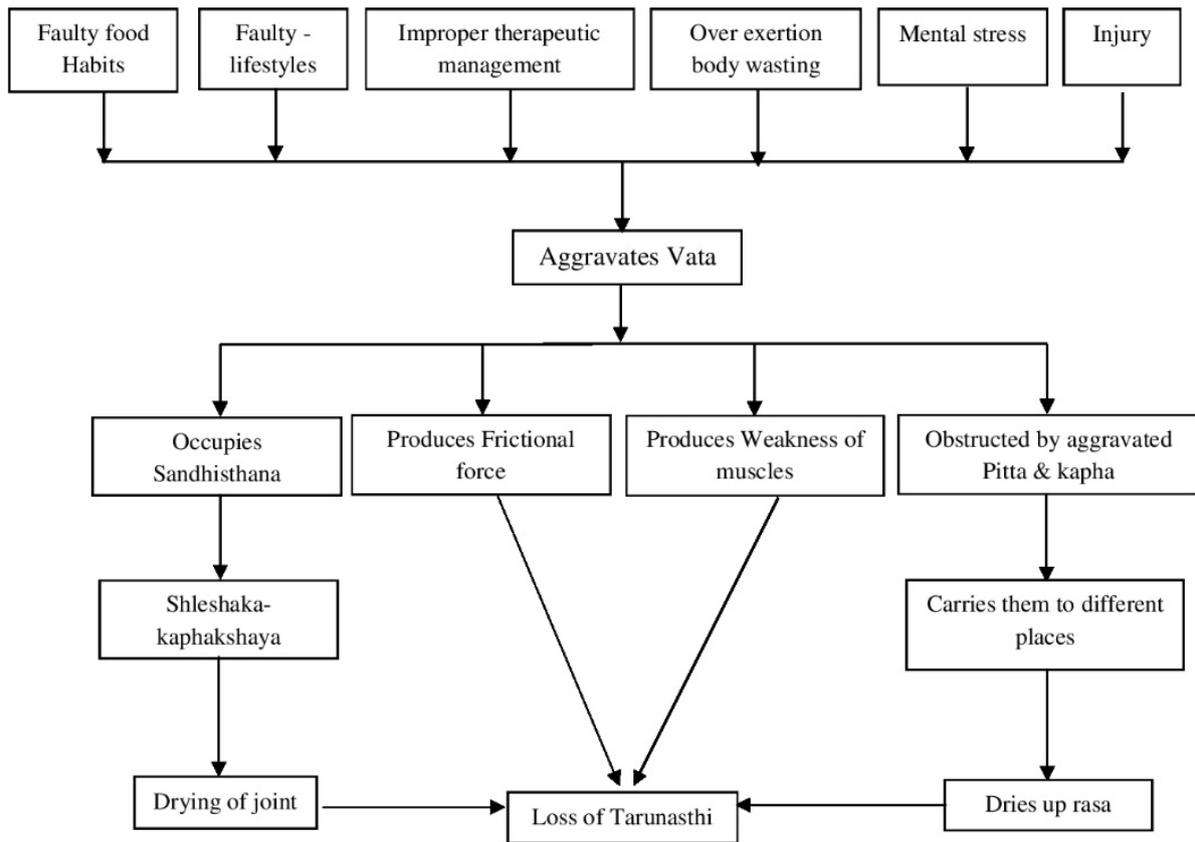


Chart No. 1 showing pathogenesis of Sandhigatavata

Table 1: Different Causes of Vata Aggravation

Sl. No.	Causes	Activities
1.	Faulty food habits	Overindulgence in dry, cold, scanty, light digestible eatables, production of amadosha.
2.	Faulty lifestyles	Excessive night vigils and overindulgence in sexual intercourse.
3.	Improper therapeutic management	Panchakarma, Anuchita sharirikachesta (improper bodily activity), excessive diminution of doshas and bloodletting.
4.	Over exertion (body wasting)	Swimming, wayfaring and other exercises, debility due to protracted disease, wasting of body tissues.
5.	Injury	Injuries to vital organs, riding fast on elephants, camel or horse cart or falling during ride on vehicles.
6.	Mental Stress	Worries, grief, suppression of natural urges.

Upstambhita: If associated with pitta and kapha patient may be detoxified with mild unctuous purgatives and emetics. Non-unctuous enema made up of appetisers and digestive drugs may be given if patient is not fit for purgation. Maharasanadi kwatha, Triphala guggulu, Amrita guggulu, Kaishore guggulu, Rasana guggulu, Samirpannaga rasa, Bhallataka parpati, Bhallataka rasayana, Kulatha yusha, *Caesalpinia crista* and *Allium sativum* are useful.

Cauterisation, sudation, poultices, bloodletting are useful in both type of Sandhigatavata. Deformity to be managed with poultices, contractures by massage with oil cooked in black gram and rock salt. If vata is located in arms and head, nasal drops and post meal intake of clarified butter is advised. Generalised or localised vata can be controlled by enema alone²⁵.

Decoction of *Vitex negundo* is useful for fomentation, bloodletting is done considering association of doshas; maximum amount should not exceed 50 ml. Cauterization should be done at the site of pain; if multiple joints are involved base of right thumb

should be cauterized. Refined *Aconitum ferox*, *Datura metel*, lepa guti and dashanga lepa can be applied at the site of pain and swelling²⁶.

Based on Ayurvedic line of treatment patients of Sandhigatavata was given a multi model therapy comprising of oleation, sudation, mild purgation, matrabasti, and leech therapy, along with oral medications like Yogaraja guggulu and *Withania somnifera* and local application of Narayana taila. The results have been analyzed statistically by using the Student paired 't' test. The therapy showed highly significant (P < 0.001) result. On overall effect of therapy, 4% of the patients were relieved completely, while 24% have shown marked improvement, 50% moderate improvement, and 22% mild improvement.

Narayana taila: Sesame oil processed with drugs like *Stereospermum suaveolens*, *Withania somnifera*, *Clerodendrum phlomidis* Linn. f., *Sida cordifolia* etc. in preparing Narayana taila. It is used for massage and matrabasti.

Sudation reduces contraction, extension, pain, stiffness, heaviness, and numbness. Poultice increases the local circulation and rate of drug absorption. *Vitex negundo* possesses analgesic and anti-inflammatory activities.

Mild purgation detoxifies the body, increasing the absorption of drugs and providing nourishment. Seeds of castor have purgative, channel-cleansing, pacifying vata and carminative properties. Oil used for massage alleviates vata and features like pain and stiffness.

Non-unctuous enema cleanses the colon and makes absorption of matrabasti properly. Matrabasti nourishes the body, promotes the strength and alleviates vata through the rectocolonic route. *Withania somnifera* has a chondro protective effect on the damaged human osteoarthritic cartilage.

Leech therapy is recommended in involvement of rakta dhatu.

Yogaraja guggulu comprises of drug known for vata alleviating properties with anti-inflammatory and anti-arthritis activities and *Commiphora mukul* is a potent inhibitor of the enzyme responsible for inflammatory response²⁷.

Yoga and meditation offer in the treatment of osteoarthritis. Yoga focus on balance and alignment, helps improve biomechanical imbalances that create stress on the joints. Misalignments of bones, dysfunctional movement patterns, lack of body awareness, and poor posture can all contribute to wear and tear of the cartilage. Paschimottanasana, Bhujangasana, Utthita-Parsvakonasana, Matsyendrasana, Trikonasana, Garudasana, Virabhadrasana & Meditation can help deal with the stress associated with living with a chronic pain condition. A study by Randolph in 1999 found that meditation enhances the effectiveness of western medical treatment. In this study, patients were taught hath-yoga; a year later patients reported feelings of pain decreased by 79 percent²⁸.

The ACR stated that Ayurveda offers "safe and effective treatment alternatives" for OA. *Boswellia serrata*, *Curcuma longa*, *Withania somnifera*, *Zingiber officinale*, *Triphala*, *Asparagus racemosus* and zinc reported less joint pain and increased mobility and strength.

- *Boswellia serrata*, blocks an enzyme (5-lipoxygenase) which stimulate inflammation.
- *Curcuma longa* (curcumin) inhibit key inflammation-producing enzymes (lipo-oxygenase, cyclo-oxygenase, and phospholipase A2), it protects the stomach against (NSAIDs).
- *Withania somnifera* extract suppresses the production of pro-inflammatory molecules (TNF-alpha and two interleukin subtypes). The anti-inflammatory effect was like hydrocortisone.
- *Zingiber officinale* works as an anti-inflammatory by interfering with an enzyme (cyclooxygenase). *Zingiber officinale* has a moderate beneficial effect on OA of the knee.
- Triphala have anti-inflammatory effects.
- *Commiphora mukul* has been a potent inhibitor of the enzyme NFkB, which regulates the body's inflammatory response.
- *Asparagus racemosus* has an inhibitory effect on TNF-alpha, and IL-1B.²⁹

The government of India launched the New Millennium Indian Technology Leadership Initiative (NMITLI) programme in 2002

and included Ayurveda. Knee OA was chosen as a key therapeutic target to validate some potential Ayurvedic drugs. VAS and modified version of WOMAC questionnaire were used to assess pain, stiffness, and functional ability in the knees³⁰.

In a 6-month controlled study of knee OA, two Ayurvedic formulations SGC and SGCG, comprising of extracts of *Zingiber officinale*, *Commiphora mukul*, *Embllica officinalis* and *Zingiber officinale*, *Commiphora mukul*, *Embllica officinalis* & *Boswellia serrata* were given for 24 weeks and significantly reduced knee pain and improved knee function and were found equivalent to glucosamine and celecoxib. Some patients showed asymptomatic increased in SGPT with otherwise normal liver function; which was normalized after stopping the drug³¹

CONCLUSION

OA commonly age related, earlier was thought as incurable but manageable disease. Various scale and questionnaire are devised to analyse the severity of disease and predict the prognosis. In this debilitating condition Ayurveda provide efficient treatment. Various studies conducted on principles of Ayurveda proved to provide good management of the disease in the early stage of its development (Grade 1 and Grade 2 of K&L Score). Also, in later stage of disease, Ayurvedic treatment improves the quality of life there by decreasing the burden of disease on patient and community.

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