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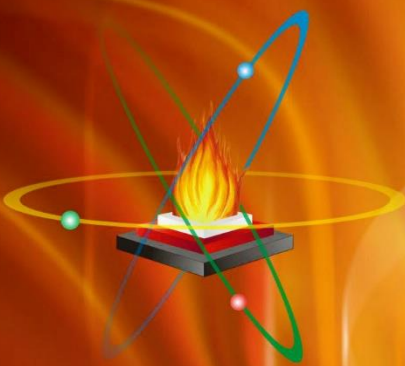
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Research Article

Management of the Symptoms Associated with Osteoarthritis of the Knee Through an Integrated Approach Including Yagya Therapy

Alka Mishra¹, Lalima Batham¹, Shilpi Verma², Saurabh Mishra^{3*}, Vandana Shrivastava¹

¹Department of Ayurveda and Holistic Health, Faculty of Yog and Health, Dev Sanskriti Vishwavidyalaya, Haridwar

²Department of Yogic Sciences and Human Consciousness, Faculty of Yog and Health, Dev Sanskriti Vishwavidyalaya, Haridwar

³Training Cell, Dev Sanskriti Vishwavidyalaya, Haridwar

*Corresponding author: Saurabh Mishra. Email: sau.dsvv@gmail.com

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Abstract. Background: Osteoarthritis (OA) of the knee is a major cause of mobility impairment. Therapeutic interventions conventionally employed for OA include the use of physiotherapy, patient education and weight control, drug therapy that includes non-opioid analgesics, topical analgesics, opioid analgesics and intra articular steroid injection. At times, cases of OA also extend on to knee arthroplasty (knee- replacement) surgery too. However, side-effect free, long-term management of this disease still remains a challenge. Purpose: Classical Ayurveda locks in the symptoms of Osteoarthritis as Janu Sandhigata Vata, where Janu refers to knee, sandhi is joint and Vata is the air element permeating the knee joint – in this case, With advancing age, the influence of Vata Dosha increases, resulting in the gradual degeneration of the body. Sandhigata Vata can be defined as a disease of sandhi (articulation) with symptoms of - sandhi shool(shola- pain) (joint pain), sandhi shotha (shotha - inflammation) (inflammation in joints), etc. Hence, the medicinal herbs that balance the Vata Dosha, as well as provide nourishment to the body tissues, are used in the Ayurvedic treatment of OA of the knee. A number of medicinal herbs have been found to be effective in this regard. Yagya Therapy provides pulmonary inhalation of medicinal smoke of multiple herbs (generated through oblation in fire along with chanting of Vedic hymns), which have the potential for the treatment of OA of the knee, and associated difficulties. Methodology: A case report about a male patient, who was suffering from Osteoarthritis (OA) in the right knee, as well as other associated

difficulties, has been presented in this article. The patient was prescribed an integrated approach pivoting on Yagya Therapy (using an appropriate herbal formulation - hawan-samagri), and some other Ayurvedic treatments like decoction (kwath) of medicinal herbs, Ayurvedic medicines, dietary restrictions, etc. Discussion: Before taking up the integrated approach pivoting on Yagya Therapy (prescribed in the present study), the patient suffered from excruciating knee-pain that resulted in a limping gait. Post-initiation of the prescribed treatment the pain issue accompanied by limping gait is seen to be almost completely resolved. The patient is able to manage long walks up to half a kilometer without experiencing discomfort. . Earlier, the patient had to take support while changing posture from sitting to standing, and vice-versa; now he can change posture without support; Prior to therapy, patient was not able to sit cross legged on floor, which is an integral part of Indian lifestyle – now he does so, sans any discomfort. There is a definite amelioration in the patient's pain management regime. Conclusion: The present study shows encouraging result with regards to the effectiveness of integrated approach including Yagya Therapy in the treatment of symptoms associated with OA of the knee, and associated complexities.

Keywords. Janu Sandhigata Vata, Osteoarthritis of Knee, Yagya Therapy, Ayurveda, Pulmonary Inhalation, Herbal Medicines

Introduction

Osteoarthritis (OA) of the knee is a major cause of mobility impairment (1). Risk factors for the development of OA are age, obesity (high BMI (body mass index)), excessive musculoskeletal loading, previous knee injury, female gender, positive family history, muscle weakness, diabetes mellitus (in males) and hysterectomy (in females) (2). Therapeutic interventions conventionally employed for OA include the use of physiotherapy, patient education and weight control, drug therapy including non-opioid analgesics, topical analgesics, opioid analgesics and intra-articular steroid injections, knee replacement surgery, etc. (3). However, side-effect free, long-term management of this disease is still not achieved (3,4); hence, there is a definite need to look for other safe and effective therapies for patients suffering from OA of the knee.

According to a WHO report published in 2013 (5), a number of studies show that patients with specific chronic musculoskeletal disorders use Traditional and Complementary Medicine (T&CM) services more often. This report lists some of the common Traditional Medicine (TM) services in India as Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH).

According to Ayurveda, a healthy human body is supposed to have a relatively stable equilibrium (congenial homeostasis) of Dosha (psycho-biological rhythm - Vata, Pitta, Kapha), Dhatu (body tissues) and Mala (excreta) (6); Acharya Sushruta defines health as an equilibrium of Dosha (psycho-biological rhythm), Agni (digestion and metabolism), Dhatu (body tissues), Malakriya (excretory function), as well as the well being of soul, senses and mind (6). Imbalance in this equilibrium leads to disease, and the aim of the therapy is to restore this balance. Treatment of disease involves procedures for purifying the biological system by removing the vitiated elements from the entire body, and thus causing disease prevention, as well as health promotion (7).

As per the classical texts of Ayurveda, the disease that resembles the symptoms associated with OA of the knee is Janu Sandhigata Vata. Vata is the governing

factor that maintains equilibrium in the Universe, as well as in the human body; as a person grows older, the influence of Vata Dosha increases, resulting in the gradual degeneration of the body (8). Sandhigata Vata can be defined as a disease of sandhi (articulation) with symptoms of - sandhi shool (joint pain), sandhi shotha (swelling in joints), akunchana prasarana pravritti savedana (pain during movements like flexion and extension), atopa / sandhisphutana (crepitus), and in later stage, it converts into hanti sandhigatah (restricted movement of joints) (9-12). It is a type of Vata-vyadhi (Vata related disease), which mainly occurs in old age due to 'dhatukshaya' (depletion of dhatus), which limits everyday activities such as walking, dressing, bathing, etc., thus making the patient disabled (13). When Vata involves janu sandhi (knee joint), it is called 'Janu Sandhigata Vata' - OA of the knee.

According to Ayurveda, the prime modalities of treatment of Sandhigata vata are Snehana (oleation), Swedana (sudation), Dahana (cauterization) and Upanaha (poultice). Acharya Sushruta has mentioned the treatment for Sandhigata vata as Snehana, Swedana, Upanaha, Agnikarma (cauterization), Bandhana (bandage) and Unmardana (massage) {Sushrut Samhita - Chikitsa Sthan 4/8} (11). Since the vitiation of the Vata Dosha is one of the primary cause of this disease, hence, treatments that pacify the Vata Dosha are recommended for its management (1,13,14).

Various herbal medicines like Bala (*Sida Cordifolia*) (13), Guggulu (*Commiphora Wightii*) (1,8,13,14), Ashwagandha (*Withania Somnifera*) (1,3,8,14), Rasna (*Pluchea lanceolata*) (14), Pippalimula (*Piper longum*) (14), Nirgundi (*Vitex Negundo*) (14), Shallaki (*Boswellia Serrata*) (3,14), etc. have been found to be useful in the treatment of OA of the knee, because of their beneficial properties like Vata pacifying, tissue nourishing (Vrihan), etc.

Yagya is an ancient Indian therapeutic procedure (15-28), which is aimed at providing all round well-being of an individual. In the process of Yagya, coarse powder (hawan-samagri) made up of dry plant-

medicines, as well as selected nutritious and aromatic substances, undergoes transformation into vapor phase, sublimation or decomposition by gradual heating; these phytomedicines spread along with the volatile substances and gases, released by the slow and controlled combustion process in Yagya fire (19). Medicinal phytochemicals, vapors of some essential oils and certain other volatile healthy constituents released in this process impart therapeutic advantage (16,19).

Yagya Therapy, with disease-specific herbal preparation, has been shown to be an effective therapy for the treatment of various other physiological and psychological ailments. Raghuvanshi et al. (2009) (19) administered Yagya Therapy to 15 patients of pulmonary tuberculosis in the age group of 15-60 years for 35 to 75 days using an anti-tubercular herbal preparation of Ayurvedic plant medicines. The effects were tested by sequential readings on different clinical physiological, microbiological, hematological, biochemical and pathological parameters, and the results showed encouraging healing possibilities of Yagya Therapy for pulmonary tuberculosis (15-17,19,21). Batham et al. (2018) (25) showed that Yagya Therapy, as supportive care, can prevent the occurrence of epileptic seizures. Verma et al. (2018) (26) demonstrated the effectiveness of Yagya Therapy in the treatment of Sub-clinical hypothyroidism (SCH). Mishra et al. (2018) (27) showed that Yagya Therapy, as supportive care, improved quality of life in cancer patients.

A case report about a male patient, who was suffering from OA of the knee, as well as other associated difficulties, is being presented here. He visited the Out Patient Section of the Department of Ayurveda and Holistic Health at Dev Sanskriti Vishwavidyalaya, Haridwar. In view of the above discussion about OA of the knee and its management, an integrated approach including Yagya Therapy (using an appropriate herbal formulation - hawan-samagri), and some other Ayurvedic treatments like decoction of medicinal herbs, Ayurvedic medicines, dietary restrictions, etc. was prescribed to the patient, and the effectiveness of the same is being presented in this

article.

Material and Methods

In the present study, an integrated approach pivoting on Yagya Therapy (using an appropriate herbal formulation), and some other Ayurvedic treatments like decoction of medicinal herbs, Ayurvedic medicines, dietary restrictions, lifestyle modifications, etc., was prescribed to a male patient suffering from OA of the knee.

Case Report

A 68 year old male patient (height 156 cm, weight 46 kg) came to the Out Patient Section of the Department of Ayurveda and Holistic Health (DAH) at Dev Sanskriti Vishwavidyalaya, Haridwar, in September 2018, with complaint of OA of the knee and associated difficulties; the medical history based on the details reported by the patient and his past medical reports is as follows:

- Patient had been suffering from OA in the right knee.
- About 11 months before the visit to DAH, the patient had sought medical advice elsewhere; he was advised conventional medicines including NSAIDs, fomentation with warm water, and some advisory like not sitting on the floor and not sitting cross-legged. About one month ago also the patient had sought medical advice elsewhere; blood and urine tests were normal; moderate degree cystitis was reported.
- At the time of the visit to DAH the patient still had the following problems: Because of OA in the right knee, the problem was so much aggravated that the patient had to somewhat limp while walking, and had difficulty in walking. Patient had to take support while changing posture from sitting to standing, and vice-versa. Patient had problem in sitting cross-legged

Therapeutic Intervention

As mentioned above, the patient was suffering from OA in the right knee (Janu Sandhigata Vata) and associated difficulties. Hence, an integrated approach including Yagya Therapy (using an appropriate herbal formulation), and supplementary Ayurvedic treatment

support that included decoction of medicinal herbs, Ayurvedic medicines, diet specifics, lifestyle modifications, etc., was prescribed to the patient, with the understanding that the patient had come to the Out Patient Section, and would be taking these treatments at his home. The prescribed therapeutic interventions were as follows:

Yagya Therapy with Vata-vyadhi Shamak (Vata Pacifying) hawan-samagri (herbal mixture formulated specifically for oblations in Yagya fire.) Patient was advised to follow the standard protocol of Yagya at home. The detailed protocol has been described in earlier publications (24,28,31,32). Briefly, the procedure included (24,31,32):

- Doing Shatkarma for both internal and external purification (Pavitrikaran, Achaman, Shikhavandan, Nyasa - i.e. spiritual practices for purification), Prithvi Pujan (prayers to Mother Earth), Chandan-dharan (applying sandalwood paste or roli-red powder on forehead), Guru-avahan (invoking the spiritual guide)
- Followed by - 24 oblations of the herbal mixture (Vata-vyadhi Shamak hawan-samagri) in the fire, along with the chanting of Gayatri Mantra - specifically Surya Gayatri Mantra, i.e. Om Bhoor Bhuvah Swah, Bhaaskaraay Vidmahe, Diwaakaraay Dheemahi, Tannah Sooryah Prachodayaat (21,24,28), with the aim of providing strength and vigor, which can be beneficial in diseases caused by the aggravation of Vata Dosha. This was followed by* Pranayama, while sitting near the Yagya fire

Patient was advised to use herbal mixture (hawan-samagri) prescribed by Department of Ayurveda and Holistic Health (DAHH), Dev Sanskriti Vishwavidyalaya, Haridwar, and ghee (clarified butter made from indigenous cow's milk).

Since past several years, DAHH has been prescribing Yagya Therapy (Yagya Therapy), wherein different herbal preparations of Ayurvedic plant medicines (hawan-samagri) have been made in-house for various

diseases. With regards to the present study, DAHH prescribed a Vata-vyadhi Shamak hawan-samagri, which consists of 21 herbs, and is based on the formulation for the same given in reference (24). No metal was used in the herbal preparation. All ingredients were well identified by taxonomist (33), were non-toxic, and could be useful in the treatment of OA of the knee (1,3,8,13,14,24).

Along with the Vata-vyadhi Shamak hawan-samagri, patient was also prescribed a common purpose immunity-boosting hawan-samagri, based on the formulation for the same given in reference (21,24). Vata-vyadhi Shamak hawan-samagri and common purpose hawan-samagri had to be mixed in 3:1 ratio (i.e. 30 gm and 10 gm, respectively); 30 gm cow ghee had to be added to this herbal mixture; and then 24 oblations, along with chanting of Surya Gayatri Mantra, had to be made in the fire with this mixture.

It was advised to do Yagya twice daily at the time of Sunrise and Sunset. The patient was advised to go with Yagya Therapy for 3 months.

Drinking decoction of Vata-vyadhi Shamak hawan-samagri (herbal mixture)

Patient was advised to drink the decoction of the Vata-vyadhi Shamak hawan-samagri, wherein 20 gm of herbal mixture had to be mixed in 4.5 cups of water; kept overnight; boiled the next morning till 1.5 cup of water was remaining; this had to be divided in two equal parts, and taken empty stomach two times during the day, i.e. in morning and evening.

Ayurvedic medicines

* Medhavardhak Churna (polyherbal mixture with memory enhancing properties (33)) - half spoon of this herbal mixture had to be taken with cow's milk, twice daily, i.e. in morning and evening.

* Ajmodadi Churna (a polyherbal Ayurvedic medicine having anti-inflammatory action (34), and Vata Dosha balancing properties (33)) - half spoon had to be taken after eating food, twice daily, i.e. in afternoon and evening - for 2 months

* Vidang + Haritaki Churna (both these herbs have Vata pacifying properties (33)) - one spoon had to be

taken empty stomach, twice daily, i.e. in morning and evening - for 2 months

Dietary advice and restrictions

- Dietary restrictions were prescribed, which included not taking Vata aggravating diet like cold and sour food items
- It was advised to eat light and simple food
- It was advised to take commonly available Vata pacifying herbs like Ajvain (Ajamod) (Trachyspermum ammi), Methi(Trigonella foenum-graecum), Trikatu(combination of three type of peppers), Sahajan(Moringa Oleifera), Alsi (Linum usitatissimum), Tila(Sesamum indicum Linn)
- It was advised to take almonds, walnut.

Other practices advised

- It was advised to perform OM Chanting, Pranayama and Joint-Loosening Yogic Exercises

Results

In the present case study, the outcomes were assessed in a qualitative (subjective) manner based on the patient's experiential feedback.

After the initial OPD visit in September 2018, the patient continued with the prescribed integrated approach including Yagya Therapy at his home. A follow up was taken from the patient over phone in March 2019. The feedback provided by the patient is as follows:

- He had been doing Yagya daily, one time in the morning
- He had been taking the prescribed decoction twice a day - morning and evening
- After Yagya, he had been doing Pranayama for half an hour daily (Nadi-Shodhan, Anulom-Vilom, Kapal-Bhati) along with some Yogic exercises.
- He had also been taking Ayurvedic medication; this included Ashwagandhadhi Kadha (decoction -

Vata pacifying (33)), Rasnadi Kadha (decoction - Vata pacifying (33)), and, Yograj Guggulu (2 tablets daily - Vata pacifying (35) - he took this medicine irregularly, and had not been taking it since one month before providing this feedback)

- Before starting the integrated therapy (prescribed in the present study), because of OA in the right knee, the problem was so much aggravated that the patient had to somewhat limp while walking, and had difficulty in walking; however, in this follow up, the patient reported that ever since he started the integrated approach including Yagya Therapy, the pain has been almost completely resolved, and he has been walking comfortably; there is no problem in walking even half a kilometer now.
- Earlier, the patient had to take support while changing posture from sitting to standing, and vice-versa; now he could change posture without support
- Earlier, the patient had problem in sitting cross-legged; now he could sit cross-legged without difficulty
- Earlier, the weight of the patient was 46 kg; now the weight had also increased to 51 kg
- The patient also reported that since last one and a half months, he had slight pain in the left leg
- Overall, the patient observed almost complete relief in his problem

Discussion

The present study illustrates the potential of an integrated approach including Yagya Therapy for the management of symptoms associated with OA of the knee, and associated difficulties.

As discussed earlier, according to Ayurveda, a healthy human body is supposed to have a relatively stable equilibrium (congenial homeostasis) of Dosha (psycho-biological rhythm - Vata, Pitta, Kapha), Dhatu (body tissues) and Mala (excreta) (6); Acharya Sushruta defines health as an equilibrium of Dosha (psycho-biological rhythm), Agni (digestion and metabolism), Dhatu (body tissues), Malakriya (excretory function), as well as the well being of soul,



senses and mind (6). Imbalance in this equilibrium leads to disease, and the aim of the therapy is to restore this balance. Treatment of disease involves procedures for purifying the biological system by removing the vitiated elements from the entire body, and thus causing disease prevention, as well as health promotion (7).

As per the classical texts of Ayurveda, the disease that resembles the symptoms associated with OA of the knee is Janu Sandhigata Vata. Vata is the governing factor that maintains equilibrium in the Universe, as well as in the human body; as a person grows older, the influence of Vata Dosha increases, resulting in the gradual degeneration of the body (8). Sandhigata Vata can be defined as a disease of sandhi (articulation) with symptoms of - sandhi shool (joint pain), sandhi shotha (swelling in joints), akunchana prasarana pravritti savedana (pain during movements like flexion and extension), atopa / sandhisphutana (crepitus), and in later stage, it converts into hanti sandhigatah (restricted movement of joints) (9-12). It is a type of Vata-vyadhi (Vata related disease), which mainly occurs in old age due to 'dhatukshaya' (depletion of dhatus), which limits everyday activities such as walking, dressing, bathing, etc., thus making the patient disabled (13). When Vata involves janu sandhi (knee joint), it is called 'Janu Sandhigata Vata' - OA of the knee.

According to Ayurveda, the prime modalities of treatment of Sandhigata vata are Snehana (oleation), Swedana (sudation), Dahana (cauterization) and Upanaha (poultice). Acharya Sushruta has mentioned the treatment for Sandhigata vata as Snehana, Swedana, Upanaha, Agnikarma (cauterization), Bandhana (bandage) and Unmardana (massage) {Sushrut Samhita - Chikitsa Sthan 4/8} (11). Since the vitiation of the Vata Dosha is one of the primary cause of this disease, hence, treatments that pacify the Vata Dosha are recommended for its management (1,13,14).

In Yagya Therapy, the hawan-samagri (mixture of medicinal herbs) contained herbs, which were chosen based on careful review of Ayurvedic pharmacology,

modern pharmacology, and scriptural indications. The beneficial properties of some of the herbs with regards to the management of symptoms associated with OA of the knee, and associated difficulties, are as follows: Nirgudni (*Vitex negundo*) (14), Guggulu (*Balsamodendron Mukul*) (1,8,13,14), Rasna (*Pluchea lanceolata*) (14), and Ajamod (*Apium graveolens*) have Vata pacifying properties (33,36); Giloya (*Tinospora Cordifolia*) pacifies all the three Doshas (i.e. Vata, Pitta, Kapha) (33,36). Bayavidang (*Embelia ribes*), Giloya (*Tinospora Cordifolia*), Ashwagandha (*Withania somnifera*), and Daruhaldi (*Berberis species*) have Balya and Rasayan properties, i.e. provide rejuvenation, and nourishment to the body tissues (33,36). Nagarmotha (*Cyperus rotundus*) and Pippalimula (*Piper longum*) have Deepan Pachan properties (36); Deepan Pachan drugs are administered for enhancing the digestive fire (37,38) and digestion of the ama dosha (undigested toxins of the body that are responsible for the blockage of micro-channels).

Thus, the ingredients of hawan-samagri have properties of pacifying the Vata Dosha, as well as providing rejuvenation, and nourishment to the body tissues. Their vapors help in the treatment of the symptoms associated with OA of the knee (24).

Patient took the decoction of the Vata-vyadhi Shamak (Vata pacifying) hawan-samagri, twice daily. As described above, the herbs in the Vata-vyadhi Shamak hawan-samagri have properties that pacify the Vata Dosha, as well as provide rejuvenation, and nourishment to the body tissues. Thus, the decoction of the hawan-samagri must have provided these therapeutic benefits as well.

The ayurvedic medicines taken by the patient had Vata pacifying, as well as rejuvenation properties. The dietary recommendations prevented taking of Vata aggravating diet, and recommended taking food items that pacify the Vata Dosha, as well as provide nourishment to the brain and boost the immunity. The other recommended practices like OM chanting provide peace and tranquility to the mind.

Besides, the other contributing factors for benefits of Yagya Therapy are nasal administration of herbs, use of ghee, use of mantras, advantage of fire, creation of healthy air and environment, role of pranayam, etc. These factors and their mechanistic roles are previously described in details (39-40).

Conclusion

Before taking up the integrated approach pivoting on Yagya Therapy (prescribed in the present study), the patient suffered from excruciating knee-pain that resulted in a limping gait. Post-initiation of the prescribed treatment the pain issue accompanied by limping gait is seen to be almost completely resolved. The patient is able to manage long walks upto half a kilometer without experiencing discomfort. Earlier, the patient had to take support while changing posture from sitting to standing, and vice-versa; now he could change posture without support; Earlier, the patient had problem in sitting cross-legged; now he could sit cross-legged without difficulty. Overall, the patient experiences almost complete relief in his problem. Thus, the present study shows encouraging result with regards to the effectiveness of integrated approach including Yagya Therapy in the treatment of symptoms associated with OA of the knee, and associated complexities. Looking at the multiple advantages of Yagya Therapy, which include positive restructuring of the psyche of the participants by the chanting of Vedic hymns (Mantras) and meditating on their meaning, exposure to medicinal-fumes of multiple herbs, as well as their efficient pulmonary administration, Yagya Therapy can be an effective treatment methodology for OA of the knee.

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Compliance with ethical standards

Informed consent was obtained from the patient.

Conflict of interest

The authors declare that they have no conflict of interest.

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