

## Original Research Article

# A survey to evaluate the efficacy of virechana, basti and knee dhara in patients with Osteoarthritis of knee joint

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### ABSTRACT

**Background:** The objective of this study was to evaluate the role of Virechana (Arhtrox) followed by Kalbasti (14 in number), Knee dhara and Matrabasti in knee osteoarthritis patients.

**Methods:** From OPD of Ayushakti Ayurveda Pvt. Ltd., 60 Patients suffering from knee Osteoarthritis (Janusandhigatavata) were selected randomly as per the inclusion and exclusion criteria. On the basis of specific criteria prepared. Group-I-(30 patients) received only Ayushakti herbs for Osteoarthritis, viz. Painmuktimj, Painmukti sandhical and Painmukti cream for LA Group-II-(30 patients) received Virechana (Arthrox), KalBastikrama (14 Bastis) and Knee dhara with oil followed by Matrabasti (60 ml) twice a week for 6 months along with Ayushakti herbs for Osteoarthritis. Each participant was in the study for 6 months. The entire study duration was 12 months.

**Result:** About 87 patients were enrolled in the study of which 60 completed the study, 27 patients were drop out of the study, at the different stages of project mainly due to poor follow up. Significant reduction in pain was observed in Groups I and II as compared to the baseline ( $p < 0.001$ ) Pain scale ( $p < 0.001$ ).

**Conclusion:** In this study, good relief was offered in knee joint pain, stiffness and mobility, and daily activities like standing, walking, and climbing. Painmukti mj, Painmukti cream and Painmukti Sandhical tablets are Anti-inflammatory, Analgesic but their efficacy can be increased with Virechana.

**Keywords:** Basti, Osteoarthritis, Sandhigatvata, Sandhi vata

### INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. Pain can be divided according to the origin and duration into three types; viz. Acute pain, Chronic pain and Labour pain.<sup>1</sup> Chronic pain, on the other hand, does not function as a warning system. When the body has been damaged, for instance by a cut or a fracture, acute pain is experienced. In the case of chronic pain the degree of pain is no indication at all of

the severity of the disease. It has been said that chronic pain's only purpose is to make one's life a misery!<sup>2</sup>

Osteoarthritis is a most common long lasting condition of joints. A joint is where two bones come together. The ends of these bones are covered with protective tissue called cartilage. In Osteoarthritis, this cartilage breaks down, causing the bones within the joint to rub together. This can cause pain, stiffness and other symptoms. Osteoarthritis is the most common form of arthritis, affecting about 237 million (3.3% of the

population). Among those over 60 years old, about 10% of males and 18% of females are affected. Increased risk of developing knee and hip osteoarthritis was found among those who work with manual handling (e.g. lifting), have physically demanding work, walk at work, and have climbing tasks at work (e.g. climb stairs or ladders).<sup>3,4</sup> With hip osteoarthritis in particular, increased risk of development over time was found among those who work in bent or twisted positions. For knee osteoarthritis in particular, increased risk was found among those who work in a kneeling or squatting position, experience heavy lifting in combination with a kneeling or squatting posture, and work standing up. Women and men have similar occupational risks for the development of osteoarthritis.<sup>5</sup>

Appropriate treatment modalities for all individuals with knee Osteoarthritis included biochemical interventions, intra articular corticosteroids, exercise, self-management and education, strength trainings, and most important weight management.<sup>6</sup>

Sandhivata nomenclature available in Ayurvedic literatures for this clinical entity, which is similar to Osteoarthritis.<sup>7</sup> The cause of sandhivata in Ayurveda is attributed to improper diet, life style, and old age etc. leading to degeneration of body elements (dhatukshaya), aggravation of vata; the humor responsible for all the movements and functions of the body and reduction in shleshakakapha, a slimy substance present in the joints.<sup>8</sup>

The aggravated vata brings rukshyata (dryness), laghutva (lightness or porousness), kharatva (coarseness) in the joints causing degeneration. In sandhivata, sandhishula (pain in affected joint) is the main feature. The other including features are shotha (swelling), stabdata (stiffness), atopa (crepitus) and difficulty in performing the functions of involved joint.

Acharya Charaka has described Panchkarma therapies in the management of Osteoarthritis along with oral medicines viz. Vamana, Virechana, Basti (Anuvasana+Niruha), Nasya, and Raktmokshana. Ayurveda and Panchakarma therapies have been found very effective in the management of Sandhigatvata. Snehan and Swedan (Oleation and Sudation) are the prime line of treatment in different VataVyadhi.<sup>9</sup> Acharya Charaka has given common principles of Vata VyadhiChikitsa, that is, repeated use of Snehana and Swedana.<sup>10</sup> According to Sushruta Snehana, Upanaha, Agni karma, Bandhana and Mardana are the principles for the treatment of Sandhigata Vata.<sup>11</sup>

On the basis of literature and day to day clinical practice, author performed a retrospective study in knee osteoarthritis patients. The main aim of the study was to evaluate the role of Virechana (Detox) followed by Kalbasti (14 in number) and Knee dhara and Matrabasti. Aim of this study to evaluate the role of Virechana

(ARTHROX) followed by Kalbasti (14 in number), Knee dhara and Matrabasti in knee osteoarthritis patients.

## **METHODS**

From OPD of Ayushakti Ayurveda Pvt. Ltd., 60 Patients suffering from knee Osteoarthritis (Janusandhigatavata) were selected randomly as per the inclusion and exclusion criteria on the basis of specific criteria prepared.

### **Study design**

### **Sample size consideration**

As this is a proof of concept study, with no previous clinical results available, a sample size of 30 completed patients in each group has been considered adequate to address the study objectives.

### **Randomization criteria**

The participants were randomized into two groups as per a computer generated randomization list.

Group-I (30 patients) received only Ayushakti herbs for Osteoarthritis, viz. Painmuktimj, Painmukti sandhical and Painmukti cream for LA.<sup>12</sup>

Group-II (30 patients) received Virechana (ARTHROX), Kal Basti karma (14 Bastis) and Knee dhara with oil followed by Matrabasti (60 ml) twice a week for 6 months along with Ayushakti herbs for Osteoarthritis.

### **Study population**

#### **Inclusion criteria**

- Patients with either sex Male or Female between age of 30 to 65 years
- Patients prediagnosed with Knee osteoarthritis by X ray
- Patients with osteophytes formation
- Patients having clinical symptoms of Osteoarthritis
- Patients having joint space reduction.

#### **Exclusion criteria**

- Gouty Arthritis, Tuberculousarthritis, Rheumatoid arthritis
- Patients having other systemic disorders with may interfere with the course of the disease and its management
- Patients who are incapacitated, bedridden and confined to wheelchair
- Patients not fit for Virechana (Detox) and Basti (Enema)
- Patients with Anorectal diseases.

**Study duration**

Each participant was in the study for 6 month. The entire study duration was 12 months.

**Intervention**

- Mahanarayan oil for external Snehana
- Mahatiktaghrut for Internal Snehana.
- Virechan plus tablet for Virechana.
- Jivanshakti tablet for Decoction in Basti.
- Mahanarayan oil and Balada oil for Knee Dhara.
- Mahanarayan oil with Jivanyaghrut, Balada oil, Vaca oil for MatraBasti.

**Herbal remedies**

Pain Mukti MJ 400 mg twice a day after food , Pain Mukti Sandhical 720 mg twice a day after food, Pain Mukti Cream for local Application. All the drugs were purchased from Ayushakti Ayurveda Pvt Ltd pharmacy, Plot number 78, Stice, Musalgaon, Sinnar, Nashik-422112.

**Assessment criteria**

The results were assessed with a scale developed by Ayushakti Ayurveda Pvt Ltd, which was validated by Scientific Research committee, Ayushakti Ayurveda Pvt Ltd, Bhadran nagar crossroad, Malad, Mumbai, Maharashtra, India.

This scale is a disease specific, self-administered health status measures. It probes clinically important symptoms in the areas of Pain, stiffness, and physical functions in patients with osteoarthritis of the knee joint.

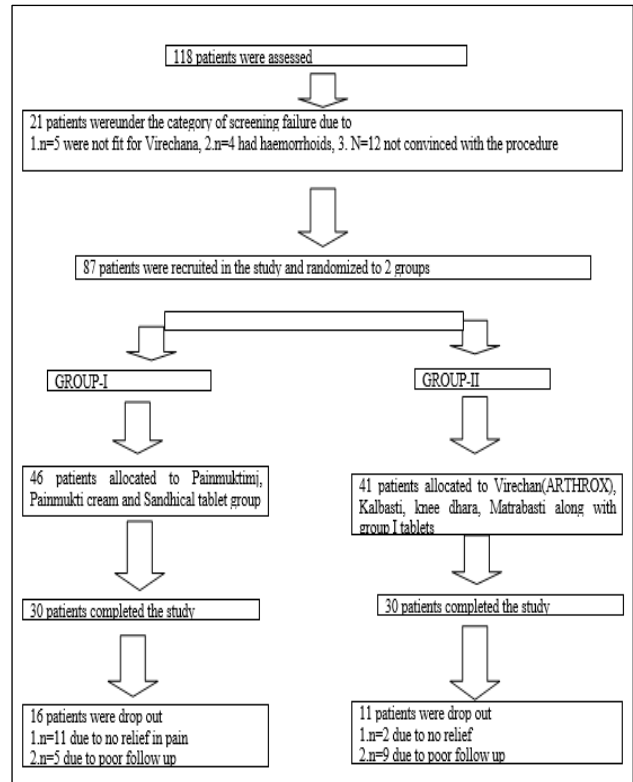
The index consists of 10 questions (3-pain, 3 stiffness, 4 physical functions) and this scale can be completed in short duration.

Individual scale question responses are assigned a score between 0 (none) to 3 (Extreme). Total assessment of the therapies was done on the basis of relief in the main signs and symptoms of disease, general signs and symptoms of disease.

**Statistical analysis**

Mean score (X), standard deviation (S.D), Standard error (SE), paired TDS test were carried out at the level of 0.05, 0.01 and 0.001 of p level. Then after that results were interpreted as under

- P >0.05=insignificant
- P <0.05=Significant
- P <0.01=Significant result
- P <0.001=highly significant result.



**Figure 1: Study flow chart.**

**RESULTS**

About 118 patients were screened to participate in the study to achieve the target of 60 patients. Of these 21 patients were screening failure due to reasons shown in flow chart. 87 patients were enrolled in the study of which 60 completed the study, 27 patients were drop out of the study, at the different stages of project mainly due to poor follow up.

Ayurveda recommends Panchakarma therapies in chronic diseases like Osteoarthritis, which gives instant and permanent relief. Panchakarma is one of the purification method described by Ayurveda which helps to detoxify body. Panchakarma involves utilization of five sub-therapies which help to maintain normal health status. Panchakarma maintains Tridoshic balances, maintains circulatory process, imparts calmness, improves tonicity, boosts internal strength and purify whole body therefore offers relief in various diseases. The Pacifying (Shaman) treatment with only Herbs and Cleansing (Shodhan) treatment of Panchakarma pacify alleviate Doshas and normalizes functioning of Dhatu. Snehana and Swedana are preparatory steps of Panchakarma (Poorva Karma) which initiate body for main procedure; Pradhan Karma.

The two main events in any degenerative disease described by our Acharyas are Asthidhatukshyaya and Vataprakopa, and according to Samhita Vata and Asthi have Ashrayaashrayisambandh in which the herbs

causing Kshaya of Vata are responsible for Asthidhatuvridhhi and vice versa.

**Demographic distribution**

Majority of the patients enrolled in the study were Women n=48 (80 %) with average age of 54.45 years±7.59.

**Changes in pain scale**

The average pain scale changes were significant in both groups, but in group II it was found 77.95% difference after 6 months than 61.11% in group I. The average pain significantly reduced after Detoxification, Basti ,Knee dhara followed by Matrabasti twice a week for 6 months compared to the only medicines treatment in Group I (P-value <0.001). Results are shown in Table 1 and 2.

**Location of pain**

The average location of pain was found more significant in group II 77.21% than in group I 60.93%. The pain was found to shift from dependent joints to joint capsule. Results are in Table 3 and 4.

**Type of pain**

Difference in Pain type was found more significant in group-II with 76.92% than 65.71% in group-I. Still both the group showed statistically significant values in both the groups (Table 5 and 6).

**Creptus from joints**

In Sandhisphutana (creptus) 87.76% relief was seen in group-II and 66.67% in group-I. Statistically this relief in

both the groups was very significant (Table 7 and 8). Hence, Group-II therapy provided better relief in a symptom of creptus than Group-I therapy (Table 7 and 8)

**Stiffness and Mobility of Knee joint**

About 95.83% relief in stiffness in joints was observed in Group-II, while in group-I it was 70.45%. The relief in both the groups was statistically extremely significant (Table 9 and 10). Thus, Group-II therapy provided better relief in Stiffness and Mobility of knee joint than Group-I (Table 9 and 10).

**Joint effusion, swelling, edema**

Relief of 95.74% was seen in swelling in joints in group-II and 74.35% in group I. The relief in both the groups was statistically extremely significant (Table 11 and 12). Hence, Group -II therapy provided slightly better relief in Joint effusion, Swelling, Edemathan Group-I therapy (Table 11 and 12).

**Effect on activities of daily living (standing/walking/climbing)**

Considering the range of movements it was found that there was 78.57% improvement in the knee joint flexion and extension in Group II, whereas, 60.78% improvement in knee joint flexion and extension in group I ultimately improving standing and walking pattern of the patient.

The improvement provided by the therapies of both the groups was found to be statistically significant. In activities like climbing of stepping up the stairs it was found that 76 % improvement in group-II and 46.94% in group I (Table 13, 14, 15 and 16).

**Table 1: The average difference in pain scale in Group II.**

Scale of pain		Duration	Mean score	Difference	% of relief	SD±	SE±	P test
B.T.	A.T							
1 month	2.57	1.47	1.1	42.86	0.57	0.1	*** P<0.001	
3 months	2.57	0.97	1.6	62.34	0.49	0.09	*** P<0.001	
6 months	2.57	0.57	2	77.92	0.5	0.09	*** P<0.001	

**Table 2: The average difference in pain scale in Group I.**

Scale of pain		Duration	Mean score	Difference	% of relief	SD±	SE±	P test
B.T.	A.T							
1 month	2.4	1.63	0.77	31.94	0.81	0.15	** P<0.01	
3 months	2.4	1.33	1.07	44.44	0.66	0.12	*** P<0.001	
6 months	2.4	0.93	1.47	61.11	0.58	0.11	*** P<0.001	

**Table 3: Average difference in Pain location in Group II.**

Location of pain							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	2.63	1.37	1.27	48.10	0.61	0.11	*** P<0.001
3 months	2.63	0.93	1.7	64.56	0.58	0.11	*** P<0.001
6 months	2.63	0.6	2.03	77.21	0.5	0.09	*** P<0.001

**Table 4: Average difference in Pain location in Group I.**

Location of pain							
Duration	Mean score		Difference	% of relief	SD±	SE±	P test
	B. T.	A. T.					
1 month	2.1	1.27	0.87	40.62	0.64	0.12	*** P<0.001
3 months	2.1	1.07	1.07	50	0.64	0.12	*** P<0.001
6 months	2.1	0.83	1.3	60.94	0.46	0.08	*** P<0.001

**Table 5: Average Difference in Type of pain in group II.**

Type of pain							
Duration	Mean score		Difference	% of relief	SD±	SE±	P test
	B.T.	A.T					
1 month	2.6	1.23	1.37	52.56	0.57	0.1	*** P<0.001
3 months	2.6	1.07	1.53	58.97	0.69	0.13	*** P<0.001
6 months	2.6	0.6	2	76.92	0.5	0.09	*** P<0.001

**Table 6: Average Difference in Type of pain in group I.**

Type of pain							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	2.33	1.27	1.07	45.71	0.64	0.12	*** P<0.001
3 months	2.33	0.97	1.37	58.57	41	0.08	*** P<0.001
6 months	2.33	0.8	1.53	65.71	0.41	0.07	*** P<0.001

**Table 7: Average effect of treatment on Crepitus from joints in Group II.**

Crepitus from joint							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.63	0.7	0.93	57.14	0.75	0.14	** P<0.01
3 months	1.63	0.47	1.17	71.42	0.57	0.1	*** P<0.001
6 months	1.63	0.2	1.43	87.75	0.41	0.07	*** P<0.001

**Table 8: Average effect of treatment on Crepitus from joints in Group I.**

Crepitus from joint							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.4	0.93	0.47	33.33	0.58	0.11	ns P>0.05
3 months	1.4	0.83	0.57	40.48	0.59	0.11	* P<0.05
6 months	1.4	0.47	0.93	66.67	0.63	0.11	*** P<0.001

**Table 9: Average effect of treatment on Stiffness and Mobility from joints in Group II.**

Stiffness and mobility							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.6	0.6	1	62.5	0.72	0.13	*** P<0.001
3 months	1.6	0.31	1.28	80.60	0.47	0.09	*** P<0.001
6 months	1.6	0.07	1.53	95.83	0.25	0.05	*** P<0.001

**Table 10: Average effect of treatment on Stiffness and Mobility from joints in Group I.**

Stiffness & Mobility							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.47	0.9	0.57	38.67	0.61	0.11	* P<0.05
3 months	1.47	0.43	1.03	70.45	0.5	0.09	*** P<0.001
6 months	1.47	0.33	1.13	77.27	0.48	0.09	*** P<0.001

**Table 11: Average effect of treatment on Joint effusion, Swelling, Edema from joints in Group II.**

Joint effusion, Swelling, Edema							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.57	0.63	0.93	59.58	0.56	0.1	*** P<0.001
3 months	1.57	0.23	1.33	85.10	0.43	0.08	*** P<0.001
6 months	1.57	0.07	1.5	95.75	0.25	0.05	*** P<0.001

**Table 12: Average effect of treatment on Joint effusion, Swelling, Edema from joints in Group I.**

Joint effusion, Swelling, Edema							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.3	0.67	0.63	48.72	0.61	0.11	** P<0.01
3 months	1.3	0.37	0.93	71.80	0.49	0.09	*** P<0.001
6 months	1.3	0.33	0.97	74.36	0.48	0.09	*** P<0.001

**Table 13: Average effect of treatment on Daily living (Standing/Walking) in Group II.**

Effect on Activities Daily living (Standing/Walking)							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.87	1	0.87	46.43	0.64	0.12	*** P<0.001
3 months	1.87	0.57	1.3	69.64	0.62	0.11	*** P<0.001
6 months	1.87	0.4	1.47	78.57	0.5	0.09	*** P<0.001

**Table 14: Average effect of treatment on Daily living (Standing/Walking)in Group I.**

Effect on Activities Daily living (Standing/Walking)							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.7	1.37	0.3	19.61	0.56	0.1	ns P>0.05
3 months	1.7	1.1	0.6	35.29	0.66	0.12	* P<0.05
6 months	1.7	0.67	1.033	60.78	0.61	0.11	*** P<0.001

**Table 15: Average effect of treatment on Daily living like climbing in Group II.**

Effect on Activities (Climbing)							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.67	0.97	0.7	42	0.72	0.13	** P<0.01
3 months	1.67	0.63	1.03	62	0.56	0.1	*** P<0.001
6 months	1.67	0.4	1.27	76	0.5	0.09	*** P<0.001

**Table 16: Average effect of treatment on Daily living like climbing in Group I.**

Effect on Activities (Climbing)							
Duration	Mean score		Difference	% of relief	SD ±	SE±	P test
	B.T.	A.T					
1 month	1.63	1.33	0.3	18.37	0.48	0.09	ns P>0.05
3 months	1.63	1.13	0.5	30.61	0.63	0.11	* P<0.05
6 months	1.63	0.87	0.77	46.94	0.63	0.11	*** P<0.001

## DISCUSSION

The present study reveals that all the patients were with the complaint of Knee pain. Most of the patients were having complained of both knee joints involvement. All the symptoms occurred due to Vata vitiation and Kapha reduction, also Asthidhatu as well as Majjadhatu contamination, which were due to disease causing reasons and Vata vitiation, were also responsible for the manifestation of the arthritis symptoms. Ayurveda recommends Panchakarma therapies in chronic diseases like Osteoarthritis, which gives instant and permanent relief. Panchakarma is one of the purification method described by Ayurveda which helps to detoxify body. Panchakarma involves utilization of five sub-therapies which help to maintain normal health status. Panchakarma maintains Tridoshic balances, maintains circulatory process, imparts calmness, improves tonicity, boosts internal strength and purify whole body therefore offers relief in various diseases. The Pacifying (Shaman) treatment with only Herbs and Cleansing (Shodhan) treatment of Panchakarma pacify alleviate Doshas and normalizes functioning of Dhatu. Snehana and Swedana are preparatory steps of Panchakarma (Poorva Karma) which initiate body for main procedure; Pradhan Karma.

The two main events in any degenerative disease described by our Acharyas are Asthidhatukshaya and Vataprakopa, and according to Samhitas Vata and Asthi have Ashrayaashrayisambandh in which the herbs causing Kshaya of Vata are responsible for Asthidhatuvridhi and vice versa.

Snehana and Swedana with Oils and Decoctions give Vatashamaka, Balya and Anulomaka effect in chronic diseases like osteoarthritis where Vata moves in opposite direction (Pratiloma). The Shamana and Shodhana treatment pacify vitiated Doshas and Dhatus are brought

to their normal functioning.<sup>13</sup> Basti is very useful in painful disorders predominant of vata, anuvasana and niruhabasti is advised for the management of pain. Asthanabasti ie Niruh basti with decoction removes vitiated vata thus relieves pain.<sup>14</sup> Matra basti followed by Kalbasti karma given with Snigdha, Laghu, Ushna, and Tikshna guna offers Vata and Kapha pacifying effect. Snigdha guna of oil antagonise Ruksha of vata while Tikshan guna removes Srotodushti. Internal olotion with Mahanarayan oil ,matra basti and external oleation with knee dhara was performed to decrease the crepitus from knee joint. Siddha massage followed by Potalisweda made up of Ushna and Tikshna herbs antagonise stiffness pathology developed from sheet guna and ultimately removes stiffness and improves mobility of joint. Knee dhara for 14 days after virechana is applied on both knees, warm oil helps to dilate blood vessels, relax muscles, offer calming effect, and enhance the recovery process with reducing rigidity.

## CONCLUSION

In this study, good relief was offered in knee joint pain, stiffness and mobility, and daily activities like standing, walking, and climbing. Painmukti MJ, Painmukti cream and Painmukt I Sandhical tablets are Anti-inflammatory, Analgesic but their efficacy can be increased with Virechana, Knee dhara, Kalbastikarma and Matrabasti. Virechana is a process wherein all the Doshas (Toxins) are expelled out through Anus. In Virechana, mala Pakwa or Apakwa are eliminated along with excess fluid. Virechana is even a treatment for Pitta Samsargaja Doshas, Kapha Samsrista Doshas and also for Pitta Sthanagata Kapha. It is worth mentioning that Virechana, unlike the modern purgatives, is not merely an act to open the bowel, but is a complete therapeutic measure which has systemic as well as local effects. Virechana, removes aggravated Pitta and clears all channels of body, Jatharagni gets kindled and lightness sets in. Virechana

increases the absorption of basti to achieve a target of pain relief in short period of time. Virechana evacuates all morbid Doshas from all micro to macro Dhatu channels and regulates Vata, thus decreasing all symptoms of on Srotasa level. By virtue of these author can conclude better results in knee osteoarthritis.

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*Ethical approval: The study was approved by the Institutional Ethics Committee Ayushakti Ayurveda Pvt Ltd, Bhadranagar crossroad, Malad, Mumbai, India*

## REFERENCES

1. International Association for the Study of Pain: Pain Definitions. Available at: <https://www.iasp-pain.org/Education/Content.aspx?ItemNumber=1698>
2. Health 24. Pain management. Available at: <http://www.health24.com/Medical/Pain-Management/About-pain/Definition-of-pain-20120721>
3. Vos T, Allen C, Arora M, Barber RM, Bhutta ZA, Brown A, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016;388(10053):1545-602.
4. Glyn-Jones S, Palmer AJ, Agricola R, Price AJ, Vincent TL, Weinans H, et al. Osteoarthritis. *Lancet*. 2015;386(9991):376-87.
5. McWilliams DF, Leeb BF, Muthuri SG, Doherty M, Zhang W. Occupational risk factors for osteoarthritis of the knee: a meta-analysis. *Osteoarthritis Cartilage*. 2011;19(7):829-39.
6. McAlindon TE, Bannuru RR, Sullivan MC, Arden NK. OARSI guidelines for the non-surgical management of knee osteoarthritis. *Osteoarthritis Cartilage*. 2014;22(3):363-88.
7. Acharya T. Ed. Commentary chakrapanidutta of Agnivesha, chikitsasthana: charakaSamhita, chikitsasthana. [Chapter 28]. verse 72-73. Varanasi: Chowkhambha Sanskrit Sansthan;618.
8. Akhtar B, Mahto RR, Dave AR. Clinical study on sandhigatvata w.s.r. to Osteoarthritis and its management with Panchatiktaghriguggulu. *Ayu*. 2010;31(1):53-7.
9. Dutt R. Tripathi Chaukhambha Sanskrit Pratishthan; Charaka Samhita Chikitsasthan. Delhi. 2009
10. Shastri K. Charaka, Charaka Samhita, Chikitsasthana 28, Vatavyadhichikitsa/82, Revised by Charaka and Dridhabala with Hindi commentary by R.D.Shashtri. Chaukhambha Sanskritseries: Varanasi. 4<sup>th</sup> Ed. 1976:792
11. Govindaghanekar B. Sushruta, Sushruta Samhita, Vatavyadhichikitsa, Chikitsasthana 4/8. published by Motilal Banarasidaspublications, 5<sup>th</sup> ed. New Delhi. 1997:403.
12. Renuka M, Dipti K, Jairam J, Aseem P. An open, randomized, comparative clinical study to assess the analgesic and anti-inflammatory efficacy of painmukti mj tablets, painmukti cream and painmuktisandhical tablets in patients suffering from chronic pain. *Intern Ayu Med J*. 2017;5(6):1866-75.
13. Huparikar DS, Jogalekar DV. Textbook of Agadtantra. 1<sup>st</sup> Ed. 2008;7:35.
14. Shastri AD. Susruta Samhita Sutr, Ayurved Tattva Sandipika Hindi Commentary by 2001, 12<sup>th</sup> Ed. Varanasi. Chaukhambha Sanskrit Sansthan; 2001.

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