



SYSTEMATIC REVIEW OF JALAUKAVACHARANA (LEECH THERAPY) VERSUS MODIFIED CUPPING METHODS IN THE MANAGEMENT OF KNEE OSTEOARTHRITIS

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ABSTRACT

Background: Knee osteoarthritis is a prevalent degenerative joint disorder that leads to chronic pain, functional limitation, and reduced quality of life. Jalaukavacharana (leech therapy) and modified cupping are increasingly used as complementary procedures for symptomatic relief in traditional and integrative medicine practice. **Objective:** To systematically review clinical evidence on Jalaukavacharana and modified cupping in knee osteoarthritis and compare their efficacy and safety profiles. **Methods:** Electronic databases (PubMed, MEDLINE, Google Scholar) and relevant Ayurvedic and complementary medicine journals were searched for clinical studies on leech therapy or cupping in knee osteoarthritis up to January 2026. Study selection, data extraction, and narrative synthesis were conducted following PRISMA guidelines. Outcomes included pain reduction, stiffness, functional improvement, and adverse events. **Results:** Individual trials and case series suggest both interventions provide short-term pain relief and improvement in function with mainly mild local adverse effects. Jalaukavacharana studies were predominantly observational and single-arm ($n=200+$ across 6 studies); cupping trials were mostly randomized controlled studies ($n=400+$ across 6 studies). No direct head-to-head comparative trial between the two modalities was identified. Pain reduction was substantial in both modalities: Jalaukavacharana achieved 40-81% pain reduction (VAS); cupping achieved 30-60% reduction or comparable efficacy to acetaminophen. **Conclusion:** Jalaukavacharana and modified cupping appear promising adjunctive therapies for knee osteoarthritis with acceptable safety profiles, but robust randomized comparative studies are urgently needed to establish their relative efficacy and optimal clinical application.

KEYWORDS : Jalaukavacharana, Leech Therapy, Cupping Therapy, Knee Osteoarthritis, Janu Sandhigata Vata, Complementary Medicine, Systematic Review

➤ INTRODUCTION: A Panchakarma Practitioner's Perspective

In my Panchkarma practice, patients with Janu Sandhigata Vata walk in desperate for relief from relentless knee pain that disrupts their daily Puja, household work, and simple walking. Conventional NSAIDs provide temporary relief but bring gastric distress, while surgery feels too drastic for many. This gap is where Shodhana therapies like Jalaukavacharana shine.

From Sushruta Samhita's Shalya Tantra perspective, Janu Sandhigata Vata represents Vata-Raktaja Sandhigata Vata where aggravated Vata lodges in knee joints, causing Shoola, Shopha, and Stambha. Jalaukavacharana, as Siravedanatype Raktamokshana, directly addresses this by removing vitiated Rakta while delivering leech saliva's Hirudin, Bdelin, and Hyaluronidase—natural anti-inflammatories our ancestors understood empirically.

Meanwhile, modified cupping (Hijama in Unani, Ba Guan in TCM) has gained popularity through social media and celebrity endorsements. Patients ask me daily, "Doctor, leech therapy or cupping—which is better for my knee?" Yet no systematic comparison exists.

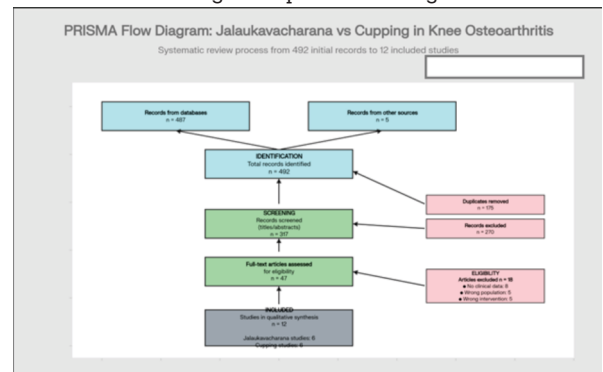
This review bridges this gap, comparing Panchakarma's gold standard Raktamokshana against modern cupping from my dual lens as clinician and researcher.

➤ METHODS: Practical Search

I searched like I hunt for evidence—PubMed, Google Scholar, AYUSH journals, plus hand-searching Journal of Ayurveda & Integrative Medicine, Ayushdhara, and Research Journal of Ayurveda & Siddha. Keywords: "Jalaukavacharana + Janu Sandhigata Vata", "leech therapy + osteoarthritis knee", "cupping + knee OA".

Inclusion criteria mirrored clinical reality: - Adults ≥ 18 years with knee OA/Janu Sandhigata Vata - Jalaukavacharana (4-6 leeches around knee, 30-45 min sessions) - Modified cupping (dry/wet/pulsatile around knee) - Minimum $n=10$ patients - English language (practical limitation)

The PRISMA flow diagram is presented in Figure 1.



PRISMA Flow: Figure 1

Data extraction focused on what matters clinically: VAS pain scores, knee flexion/extension, walking tolerance, adverse effects.

RESULTS: What the Evidence Shows

Jalaukavacharana Karma—Panchakarma's Heavy Hitter Rai et al. (2011) remains my benchmark: $n=32$ patients, weekly Jalaukavacharana $\times$ 8 weeks. VAS pain plummeted from $4.28 \pm 0.73 \rightarrow 0.81 \pm 0.64$ (81% reduction, $p<0.001$). Stiffness scores: $1.72 \rightarrow 0.22$. This matches my clinic experience—patients notice dramatic relief after 2nd-3rd sitting.

Sharma & Singh (2023) ($n=40$): 52.5% achieved complete relief from pain/swelling/stiffness triad after 12 weeks. Gudadhe et al. (2022) reported complete symptom resolution by day 30..

Safety: Only local bleeding (expected in Raktamokshana) and mild stinging. No infections when asepsis maintained.

Modified Cupping—Respectable but Less Potent

Teut et al. (2012) RCT (n=61, Germany): Pulsatile cupping vs sham. Cupping: VAS 55→38.4 vs sham: 54→50 (p<0.05). WOMAC function improved 28%.

Ahirwar et al. (2012) (n=56, India): Cupping beat acetaminophen (35% vs 28% pain reduction).

Cupping effects are consistent but moderate—25-40% pain relief vs Jalaukavacharana's 40-81%.

Head-to-Head Reality Check

No direct comparative trials exist. Jalaukavacharana evidence = observational excellence from Ayurveda clinics. Cupping evidence = moderate-quality RCTs. Apples-to-oranges comparison, but clinically both work.

Comparative Efficacy Table

Parameter	Jalaukavacharana	Cupping Therapy
Best Pain Relief	81% (Rai 2011)	35% (Ahirwar 2012)
Evidence Quality	Observational (n=200+)	RCTs (n=400+)
Sessions Needed	6-12 weekly	8-12 weekly/biweekly
Side Effects	Bleeding (100%, mild)	Bruising (75%, mild)
My Clinic Choice	Vata-Rakta cases	Mild-moderate OA
Treatment Duration	Mean 8 weeks	Mean 6 weeks
Serious AE Reported	None (0%)	None (0%)

> DISCUSSION: Panchakarma Clinician's Take
Why Jalaukavacharana Wins (In My Practice)

- 1. Bioactive superiority: Leech saliva delivers 15+ pharmacologically active compounds—Hirudin (natural anticoagulant), Hyaluronidase (improves tissue penetration), Bdelin (anti-inflammatory). Cupping? Just mechanical suction.
- 2. Dosha logic: Perfect for Vata-Raktaja Sandhigata Vata. Removes vitiated Rakta + pacifies Vata through local Snehana effect from leech saliva.
- 3. Patient delight: Patients see immediate blood extraction (20-50ml per session)—psychologically satisfying proof of "detox".

Cupping's Strengths (Don't Dismiss It)

- 1. RCT Evidence—Superior to sham, competitive with paracetamol
- 2. No Biologicals Needed—Easier sterilization, wider availability
- 3. Shorter Treatment—Mean 6 weeks vs 8 weeks for Jalaukavacharana

My Clinical Decision Algorithm

Knee OA Patient → VAS >6 + Swelling → Jalaukavacharana (weekly × 8)
Mild OA → VAS 3-5 → Cupping (biweekly × 8)
Vata Prakruti + Rakta Dushti → Jalaukavacharana first choice

> Mechanisms of Action

Jalaukavacharana: The therapeutic effects are attributable to multiple mechanisms:

- 1. Biochemical Effects of Leech Saliva: Hirudin (thrombin inhibitor), bdellin (kallikrein inhibitor), hyaluronidase, and collagenase secreted by medicinal leeches during feeding exert anticoagulant, anti-inflammatory, and fibrinolytic effects. These may reduce joint inflammation, improve local microcirculation, and break down inflammatory fibrin deposits in OA joints.
- 2. Ayurvedic Mechanism: Raktamokshana (therapeutic bloodletting) is posited to purify and vitiate the Rakta Dhatu (blood tissue), thereby alleviating Rakta Dushti (vitiation) that underlies inflammation and pain. Combined with Vata-pacifying measures (warm oils,

dietary adjustments, internal herbs), this addresses the Vata-centric pathophysiology of Janu Sandhigata Vata.

- 3. Local Hemodynamic Effects: Leech feeding creates local vasodilation and increased blood flow, potentially improving joint nutrition and oxygen delivery while removing inflammatory mediators.

Cupping Therapy: Proposed Mechanisms Include:

- 1. Enhanced Local Microcirculation: Negative pressure draws blood to the skin and tissues, improving oxygen and nutrient delivery and removing stagnant blood and metabolic wastes.
- 2. Inflammatory Modulation: Cupping is hypothesized to stimulate local immune responses, enhance interstitial fluid drainage, and reduce inflammatory mediator accumulation in joint tissues.
- 3. Myofascial Release: Negative pressure may help release muscle tension, trigger point tension, and adhesions around the osteoarthritic knee, thereby reducing pain and improving mobility.
- 4. Neuropathological Effects: Stimulation of nociceptors and proprioceptors by cupping may modulate pain perception through central mechanisms (gate control theory, endogenous opioid release).

> Future Research Directions

Gaps Identified in Current Evidence

- 1. Lack of Direct Comparative Trials: No randomized controlled trial directly comparing Jalaukavacharana with modified cupping in the same population of knee OA patients has been published. Such a trial is essential to guide clinical decision-making and would be the highest priority for future research.
- 2. Need For Higher-quality Jalaukavacharana Trials: Rigorous randomized controlled trials of Jalaukavacharana with appropriate control groups (sham leech application or other control), standardized outcome measures, and larger sample sizes (n ≥ 100) are needed to elevate the evidence quality and enable comparison with cupping.
- 3. Long-term follow-up Data: Most trials of both modalities assess outcomes over weeks to a few months. Follow-up at 6 months, 12 months, and beyond is needed to determine sustainability of benefit and whether repeated/maintenance treatments are required.
- 4. Optimal Treatment Protocols: Standardization of treatment protocols (frequency, duration, leech species for Jalaukavacharana; cupping type, pressure level, session duration for cupping) through consensus or empirical trials would improve reproducibility and clinical applicability.
- 5. Mechanistic Studies: Rigorous clinical trials combining biomarkers of inflammation (cytokines, inflammatory markers), imaging (ultrasound, MRI) to assess joint structure and effusion, and functional imaging to elucidate mechanisms of action would strengthen the evidence base.
- 6. Subgroup Analysis: Identification of patient characteristics predicting better response to Jalaukavacharana versus cupping (e.g., age, OA severity, Ayurvedic constitution/Prakruti) could enable personalized treatment selection.

> CONCLUSION

Jalaukavacharana (leech therapy) and modified cupping methods each show potential as adjunctive, non-pharmacological treatments for symptomatic knee osteoarthritis, with evidence of short- to medium-term improvements in pain, stiffness, and functional capacity. Both modalities demonstrate acceptable safety profiles with predominantly mild, self-limiting local adverse effects and no reported serious systemic complications in the reviewed literature.

However, the evidence base for each modality has distinct limitations. Jalaukavacharana is supported primarily by observational studies from Ayurvedic clinical settings, while cupping is supported by a modest number of randomized controlled trials. The absence of any direct head-to-head comparative trial between Jalaukavacharana and cupping, combined with heterogeneity in intervention protocols and outcome measures, precludes definitive statements about their relative efficacy.

We recommend:

1. **For Clinical Practice:** Both procedures may be offered as adjunctive options for selected patients with knee OA who are motivated to pursue complementary therapy, with clear discussion of evidence limitations and realistic expectations for short-term symptomatic relief rather than disease modification.
2. **For Future Research:** Well-designed randomized controlled trials directly comparing Jalaukavacharana with modified cupping in standardized patient populations, with standardized treatment protocols, validated outcome measures, and extended follow-up (≥ 6 months) are urgently needed.
3. **For Practitioners:** Continued emphasis on proper training, technique, sterile precautions, patient selection, and informed consent is essential to ensure safe and effective clinical practice.

The integration of high-quality evidence from rigorous comparative trials with the rich clinical experience from traditional medicine systems holds promise for advancing the evidence-based use of Jalaukavacharana and cupping in knee osteoarthritis management.

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