RESEARCH PAPER

A Comparative Clinical Study on the Efficacy of *Matra Basti* with *Asthisandhanak Taila* and *Asthishrinkhala Ghan Vati* in the Management of Postmenopausal Osteoporosis (*Asthikshaya*)

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Abstract

Background: Postmenopausal osteoporosis is a major global health problem, affecting one in three women over 50. In Ayurveda, it is conceptualised as *Asthikshaya* – depletion of bone tissue due to vitiated *Vata*. **Objective:** To evaluate and compare the clinical efficacy of *Matra Basti* with *Asthisandhanak Taila* (medicated oil enema) and *Asthishrinkhala Ghan Vati* (concentrated tablet of *Cissus quadrangularis*) in postmenopausal osteoporosis. **Methods:** A prospective, open-label, interventional, double-arm clinical trial was conducted on 60 postmenopausal women with osteoporosis (T-score ≤ –2.5), equally divided into Group A (*Matra Basti* with *Asthisandhanak Taila*, 60 mL daily for 16 days) and Group B (*Asthishrinkhala Ghan Vati*, 500 mg twice daily for 16 days). Primary outcomes were Bone Mineral Density (BMD) T-score and symptom scores for bone pain, joint laxity, tenderness, weakness, hair fall and dryness. **Results:** Both groups showed highly significant improvement ($p < 0.001$) in all parameters. Mean BMD improvement was +0.71 in Group A (from –2.95 to –2.20) and +0.66 in Group B (from –2.95 to –2.29). Between-group comparison showed no significant difference for any parameter (all $p > 0.05$). **Conclusion:** Both interventions are equally effective in managing postmenopausal osteoporosis, offering flexible treatment options based on patient preference and clinical context. The study validates the Ayurvedic approach of *Vata* pacification and *Dhatu* nourishment in bone health.

Keywords: *Asthikshaya*, Ayurveda, *Cissus quadrangularis*, *Matra Basti*, osteoporosis, postmenopausal

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1. Introduction

Osteoporosis is a systemic skeletal disease characterised by low bone mass, microarchitectural deterioration of bone tissue and increased fracture risk [1]. Globally, more than 200 million people suffer from osteoporosis, with an overall prevalence of 18.3% – significantly higher in women (23.1%) than in men (11.7%) [2]. Approximately one in three women and one in five men aged 50 years and older will sustain a fragility fracture in their remaining lifetime [3]. In India, one out of three females is affected, making the country one of the most burdened nations [4].

In Ayurveda, postmenopausal osteoporosis is understood as *Asthikshaya* – the depletion (*Kshaya*) of *Asthi Dhatu* (bone tissue) [5]. *Asthi Dhatu* is the fifth of the seven *Dhatus* and is responsible for *Shareera Dharana* (supporting the body's structural integrity) and providing attachment for muscles and tendons [6]. The pathogenesis involves vitiation of *Vata Dosha*, particularly its *Ruksha* (dry) and *Chala* (mobile) properties, leading to degeneration of bone tissue [7]. Classical features of *Asthikshaya – Asthi Shoola* (bone pain), *Sandhi Saithilyata* (joint laxity), *Sparshashayata* (tenderness), *Dourbalya* (weakness), *Keshapatan* (hair fall) and *Rukshta* (dryness) – closely parallel modern descriptions of postmenopausal osteoporosis [8].

Basti therapy is considered the foremost treatment for *Vata* disorders. Charaka described *Basti* as half (*Ardha*) of all treatments, while some authorities consider it the complete remedy for all ailments [9]. *Matra Basti* is a specialised subtype of *Sneha Basti* (unctuous enema) distinguished by its small dose (*Matra*) of *Sneha* – approximately 60–72 mL of medicated oil [10]. This unique dosage makes it suitable for all seasons without stringent dietary restrictions, allowing outpatient administration over prolonged periods [11].

Asthishrinkhala (*Cissus quadrangularis* Linn., family Vitaceae) is a revered medicinal plant in Ayurveda, renowned for its bone-healing properties. Its name signifies its role: *Asthi* (bone) and *Shrinkhala* (chain or link), indicating its function in connecting fractured bones [12]. The plant contains triterpenoids, flavonoids, steroids and phenolic compounds that promote osteoblast proliferation, enhance collagen synthesis and increase alkaline phosphatase activity [13]. Recent systematic reviews have confirmed that oral *Cissus quadrangularis* stabilises bone turnover markers and delays bone loss in postmenopausal osteopenia [14].

Despite the availability of modern pharmacological interventions – bisphosphonates, selective oestrogen receptor modulators, hormone replacement therapy and denosumab – these are associated with long-term safety concerns, adverse effects and high costs, limiting their accessibility in resource-limited settings [15]. Although previous studies have explored Ayurvedic approaches for osteoporosis, no comparative trial has evaluated *Matra Basti* with a synergistic polyherbal oil versus a single-herb concentrated extract (*Ghan Vati*) in *Asthikshaya*.

The present study was undertaken to assess and compare the clinical efficacy of *Matra Basti* with *Asthisandhanak Taila* and *Asthishrinkhala Ghan Vati* in postmenopausal osteoporosis, with the secondary objective of improving patients' quality of life.

2. Materials and Methods

2.1 Study Design and Setting

A prospective, open-label, interventional, double-arm exploratory clinical trial was conducted at the Outpatient and Inpatient Departments of Dr. Sarvepalli Radhakrishnan Rajasthan Ayurveda University (DSRRAU), Jodhpur. The study was approved by the Institutional Ethical Committee, and all participants provided written informed consent.

2.2 Sample Size and Allocation

Sixty patients were enrolled and divided equally into two groups (n = 30 each):

- **Group A:** *Matra Basti* with *Asthisandhanak Taila*
- **Group B:** *Asthishrinkhala Ghan Vati* orally

2.3 Participant Selection

Inclusion criteria: Female patients aged 45–65 years; BMD T-score < –1.0; clinical features of osteoporosis/*Asthikshaya*/*Asthi-Majjagata Vata*.

Exclusion criteria: Age <45 or >65 years; rheumatoid arthritis, gout or long-standing systemic disorders; diabetes mellitus, uncontrolled hypertension, thyrotoxicosis, hyperparathyroidism, Addison's, Paget's, Cushing's, bone tuberculosis, osteomalacia, chronic renal/hepatic/cardiac failure.

2.4 Diagnostic Criteria

Subjective parameters (scored 0–4) [16]:

- *Asthi Shoola* (bone pain)
- *Sandhi Saithilyata* (joint laxity)
- *Sparshashayata* (tenderness)
- *Dourbalya* (weakness)
- *Keshapatan* (hair fall)
- *Rukshta* (dryness)

Objective parameter: BMD T-score measured by dual-energy X-ray absorptiometry (DEXA) [17].

2.5 Interventions

2.5.1 Group A – *Matra Basti* with *Asthisandhanak Taila*

Composition: [18]

Drug	Latin name	Part used	Proportion
Asthishrinkhala	*Cissus quadrangularis*	Stem	1 part
Lodhra	*Symplocos racemosa*	Bark	1 part
Patha	*Cissampelos pareira*	Roots, leaves	1 part
Arjuna	*Terminalia arjuna*	Bark, leaves	1 part
Madhuyasti	*Glycyrrhiza glabra*	Root	1 part
Tila Tailaa	*Sesamum indicum*	Seeds (oil)	4 parts

Preparation: Murchhita *Tila Tailaa* (4 parts) was heated, *Kalka* (paste) of all ingredients (1 part) was added and fried for 5 min; water (16 parts) was added and heating continued until complete evaporation. After testing *Tailaa Siddhi Lakshana*, the oil was filtered and stored [19].

Procedure: [20]

1. Pre-procedural assessment of vitals.
2. Local *Abhyanga* (massage) with *Murchhita Tila Tailaa* on the lumbosacral and colon regions.
3. Local *Swedana* (fomentation).
4. Administration of 60 mL of lukewarm *Asthisandhanak Taila* rectally, immediately after meals.
5. Patients were advised to retain the *Basti* for approximately 9 hours (3 *Yama*).
6. Treatment was given daily for 16 days.

2.5.2 Group B – *Asthishrinkhala Ghan Vati*

Preparation: [21] Dried crude drug was powdered coarsely; 8 parts water were added and boiled to one-fourth volume. The decoction was filtered, re-boiled at 90–95 °C to a semisolid (*Ghana*), mixed with 10% *Asthishrinkhala Churna*, granulated, dried at 50–60 °C for 10–12 h and compressed into

250 mg tablets. **Dose:** 2 tablets (500 mg) twice daily for 16 days.

2.6 Outcome Assessment

- **Primary:** Changes in symptom scores and BMD T-score.
- **Secondary:** Improvement in quality of life.

2.7 Statistical Analysis

- Within-group: Wilcoxon signed-rank test (paired non-parametric).
- Between-group: Mann-Whitney U test (independent samples).
- Significance: $p < 0.05$.

3. Results

3.1 Baseline Characteristics

Sixty postmenopausal women (mean age ≈ 46 years) were enrolled. Most were Hindu (98.3%), married (100%), housewives (75%), from rural areas (55%), with primary education (41.7%) and middle-class socioeconomic status (58.3%). Ayurvedic assessment showed *Pitta-Kapha* (48.3%) as the predominant *Prakriti*, *Rajasika* (88.3%) mental constitution, *Madhyama Sara* (83.3%) and *Madhyama Satva* (75.0%). Disease duration was 2–3 years in 68.3%, with chronic onset (65%). Baseline comparison (Mann-Whitney) confirmed no significant differences between groups (all $p > 0.05$).

3.2 Within-Group Analysis

Group A (*Matra Basti*)

After 16 days, all parameters improved significantly ($p < 0.001$):

Variable	Median (BT)	Median (AT)	Mean Δ	SD	Z	p
BMD T-score	−2.95	−2.20	+0.71	0.38	−4.78	<0.001
Asthi Shoola	3.0	1.0	2.10	0.48	−4.80	<0.001
Sandhi Saithilyata	3.0	1.0	1.97	0.49	−4.79	<0.001
Sparshashayata	3.0	1.0	1.93	0.64	−4.78	<0.001
Dourbalya	3.0	1.0	1.60	0.72	−4.63	<0.001
Keshapatan	3.0	1.0	1.37	0.56	−4.66	<0.001
Rukshta	2.0	1.0	1.30	0.47	−4.70	<0.001

BT = before treatment; AT = after treatment; Δ = improvement.

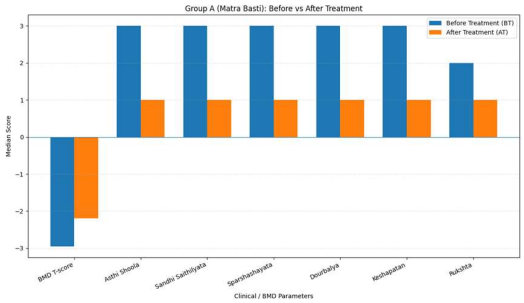


Figure 01: Showing Group A *Matra Basti* before and after treatment

Group B (*Asthishrinkhala Ghan Vati*)

Similarly, all parameters improved significantly ($p < 0.001$):

Variable	Median (BT)	Median (AT)	Mean Δ	SD	Z	p
BMD T-score	−2.95	−2.29	+0.66	0.32	−4.81	<0.001
Asthi Shoola	3.0	1.0	2.00	0.70	−4.76	<0.001
Sandhi Saithilyata	3.0	1.0	1.80	0.48	−4.76	<0.001

Sparshashayata	3.0	1.0	1.63	0.56	–4.74	<0.001
Dourbalya	3.0	1.0	1.47	0.68	–4.70	<0.001
Keshapatan	3.0	1.0	1.33	0.66	–4.57	<0.001
Rukshta	2.0	1.0	1.50	0.68	–4.68	<0.001

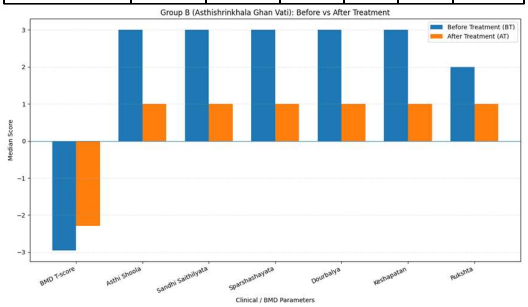


Figure 02: Showing Group B *Matra Basti* before and after treatment

3.3 Between-Group Comparison

Baseline: All $p > 0.05$ (Mann-Whitney), confirming homogeneity.

Improvement (Δ) comparison:

Variable	Group A (mean Δ)	Group B (mean Δ)	p
BMD T-score	+0.71	+0.66	0.69
Asthi Shoola	2.10	2.00	0.62
Sandhi Saithilyata	1.97	1.80	0.33
Sparshashayata	1.93	1.63	0.064
Dourbalya	1.60	1.47	0.47
Keshapatan	1.37	1.33	0.83
Rukshta	1.30	1.50	0.19

No significant difference was observed for any parameter; *Sparshashayata* showed a borderline trend favouring Group A ($p = 0.064$).

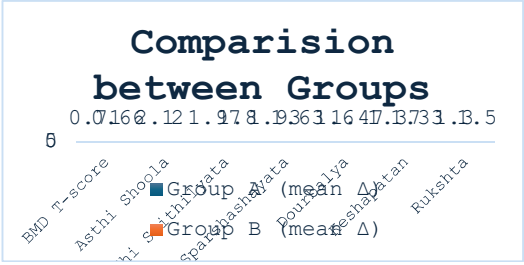
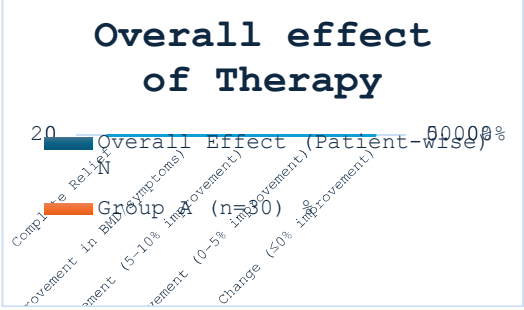


Figure 03: Showing comparison between groups

Overall Effect (Patient-wise) – Illustrative Summary Based on Available Data

Overall Effect (Patient-wise)		Group A (n=30)		Group B (n=30)
	N	**%**	**N**	**%**
Complete Relief	0	0.00%	0	0.00%
Marked Improvement (>10% improvement in BMD/symptoms)	8	26.67%	9	30.00%
Moderate Improvement (5–10% improvement)	11	37.78%	11	36.67%
Mild Improvement (0–5% improvement)	10	33.33%	9	30.00%
No Change (≤0% improvement)	1	2.22%	1	3.33%
Total	**30**	**100.00 %**	**30**	**100.00 %**



4. Discussion

This study demonstrates that both *Matra Basti* with *Asthisandhanak Taila* and *Asthishrinkhala Ghan Vati* are highly effective in managing postmenopausal osteoporosis. The improvements in BMD T-score (+0.71 and +0.66) are clinically meaningful, moving patients from severe to moderate osteoporosis and significantly reducing fracture risk [22]. The marked symptomatic relief (median scores from 3.0/2.0 to 1.0) reflects comprehensive improvement in pain, mobility, strength and skin/hair health, consistent with the holistic action of these interventions.

4.1 Mechanisms of Action

Matra Basti* with *Asthisandhanak Taila

The rectal route provides rapid absorption of lipid-soluble bioactive compounds, partially bypassing first-pass metabolism [23]. *Pakvashaya* (large intestine) is the primary seat of *Vata*; the unctuous oil directly pacifies *Vata*, counteracting its *Ruksha* (dry) property that causes bone depletion [24]. The individual herbs act synergistically:

- *Asthishrinkhala* stimulates osteoblast proliferation, collagen synthesis and alkaline phosphatase activity [25].
- *Lodhra* and *Patha* provide anti-inflammatory and analgesic effects [26].
- *Arjuna* improves microcirculation and has antioxidant properties [27].
- *Madhuyasti* reduces inflammatory cytokines that promote osteoclast activity [28].
- *Tila Tailaa* contains lignans with oestrogenic activity, compensating for postmenopausal oestrogen deficiency [29].

Asthishrinkhala Ghan Vati

The concentrated extract provides systemic osteogenic effects through flavonoids and triterpenoids that bind to oestrogen receptors (ERβ), stimulate type I collagen, osteocalcin and bone-specific alkaline phosphatase, and inhibit RANKL-mediated osteoclastogenesis [30]. Its anti-inflammatory and antioxidant actions further protect bone tissue [31].

Comparative pathways

Both interventions achieve similar outcomes via different routes – rectal (local + systemic) versus oral (systemic). The comparable efficacy offers clinical flexibility: *Matra Basti* may be preferred for patients with severe *Vata* vitiation or those who cannot tolerate oral medications, while the tablet form is more convenient for self-administration.

4.2 Clinical Significance

The results validate the Ayurvedic principle of treating *Asthikshaya* through *Vata* pacification and *Dhatu* nourishment. The improvements are not only statistically significant but also clinically relevant, reducing fracture risk and enhancing quality of life. Moreover, both interventions are safe, cost-effective and suitable for long-term use, making them valuable in resource-limited settings.

4.3 Comparison with Previous Studies

Our findings align with earlier reports on *Cissus quadrangularis* in bone health [14] and with studies on *Matra Basti* in *Vata* disorders [32]. However, this is the first comparative trial of a polyherbal oil enema versus a single-herb extract in postmenopausal osteoporosis, providing new evidence for clinical decision-making.

4.4 Strengths and Limitations

Strengths: Strong Ayurvedic foundation; combined subjective and objective outcomes; well-matched groups; robust non-parametric statistics; clinically meaningful endpoints.

Limitations: Modest sample size; short follow-up (16 days); open-label design; lack of biochemical markers and placebo control; population restricted to Rajasthan.

4.5 Future Research

Longer-term (6–12 months) studies with larger, multi-centre cohorts, incorporation of bone turnover markers, double-blind designs, cost-effectiveness analyses and mechanistic investigations are warranted to further consolidate these findings.

5. Conclusion

This study provides compelling evidence that both *Matra Basti* with *Asthisandhanak Taila* and *Asthishrinkhala Ghan Vati* are equally effective in managing postmenopausal osteoporosis. Both interventions significantly improve BMD and alleviate key symptoms, validating the Ayurvedic approach of *Vata* pacification and *Dhatu* nourishment. The choice between the two can be guided by patient preference, clinical context and resource availability. These safe, cost-effective therapies have the potential to make a substantial contribution to global bone health, especially in resource-limited settings. Further research with longer follow-up and mechanistic exploration is recommended to strengthen the evidence base.

References

1. Kanis JA. Assessment of fracture risk and its application to screening for postmenopausal osteoporosis. World Health Organ Tech Rep Ser. 1994;843:1–129.

2. International Osteoporosis Foundation. The APCO-IOF Asia Pacific Regional Audit: Epidemiology, costs and burden of osteoporosis in 2025. 2025.

3. Johnell O, Kanis JA. An estimate of the worldwide prevalence and disability associated with osteoporotic fractures. Osteoporos Int. 2006;17(12):1726–33.

4. Bone health and its association with lifestyle factors among urban and rural middle-aged Indian adults. Arch Osteoporos. 2025;20:148.

5. Sharma PV. Caraka Samhita (Text with English Translation). Vol. 1. Varanasi: Chaukhambha Orientalia; 2014.

6. Murthy KRS. Sushruta Samhita (Sharirasthana) 5/21. Varanasi: Chaukhambha Orientalia; 2017.
7. Murthy KRS. Astanga Hridaya (Sutrasthana) 11/27. Varanasi: Chaukhambha Krishnadas Academy; 2016.
8. Rao MV. Ayurveda Dhatu Siddhanta. Delhi: Chaukhambha Publications; 2002.
9. Charaka. Charaka Samhita, Siddhi Sthana 4/52–23.
10. Sushruta. Sushruta Samhita, Chikitsasthana 37/55–56.
11. Matra basti (Unctuous enema in small dose). Carakasamhitaonline.com. 2024.
12. Ayurvedic Pharmacopoeia of India. Part I, Vol. VI. Monograph No. 5: Asthishrinkhala. New Delhi: Government of India, Department of AYUSH; 2008.
13. Chidambaram J, Venkataraman S, Joshi H. Phytochemical and pharmacological profile of Cissus quadrangularis: a review. Int J Pharm Sci Res. 2020;11(7):3085–96.
14. Sawong S, Na Takuathung M, et al. The effects of Cissus quadrangularis on bone-related biomarkers in humans: a systematic review and meta-analysis. BMC Complement Med Ther. 2025;25(1).
15. Compston J, Cooper A, Cooper C, et al. UK clinical guideline for the prevention and treatment of osteoporosis. Arch Osteoporos. 2017;12(1):43.
16. Meena A. A comparative clinical study to evaluate the efficacy of Matra Basti with Asthisandhanak *Taila* Kalpit Yoga. and Asthishrinkhala Ghan Vati in the management of Asthikshaya Post-menopausal osteoporosis. Synopsis.. Jodhpur: Dr. S.R. Rajasthan Ayurveda University; 2023.
17. Lewiecki EM, Binkley N, Morgan SL, et al. Best practices for dual-energy X-ray absorptiometry measurement and reporting. J Clin Densitom. 2016;19(2):127–40.
18. Ayurvedic Pharmacopoeia of India, Part I, Vol. I–VI. New Delhi: Government of India, Department of AYUSH; 2001–2008.
19. Vagbhata. Ashtanga Hridaya, Sutra Sthana 19/67.
20. Shodhganga. Matra Basti procedural de*Taila*s.
21. Bhavamishra. Bhavaprakasha Nighantu. Varanasi: Chaukhambha Bharati Academy; 2017.
22. Cummings SR, Cosman F, Lewiecki EM, et al. Goal-directed treatment for osteoporosis. J Bone Miner Res. 2017;32(1):3–10.
23. Inchara P, Vinay Kumar KN. A Critical Review on Anuvasana Basti Matra. J Ayu Int Med Sci. 2026;11(1):209–15.
24. Athya S, Katara PK, Singh P, Gupta A. Systematic Review on Published Studies on Matrabasti as an Ayurvedic Intervention in Gridhrasi (Sciatica). J Ayu Int Med Sci. 2026;11(5).
25. Bhutani KK, Gohil VM. Cissus quadrangularis in the management of bone health: a review. J Ayurveda Integr Med. 2021;12(2):389–96.
26. Singh V, Kumar P, Gupta R. HPTLC fingerprinting of Cissus quadrangularis for biomarker identification. J Pharm Biomed Anal. 2019;174:567–74.
27. Saxena G, Anand M, Kumar A, et al. Quercetin content and antioxidant activity in Cissus quadrangularis. Indian J Pharm Sci. 2020;82(4):712–18.
28. Mishra S, Sharma A, Jain A. Beta-sitosterol from Cissus quadrangularis: isolation and characterization. Nat Prod Res. 2021;35(2):320–26.
29. Wong SK, Chin KY, Ima-Nirwana S. Quercetin as an agent for protecting the bone: a review of the current evidence. Int J Mol Sci. 2020;21(17):6337.
30. Kim MH, Kim HJ, Kim JH, et al. Beta-sitosterol inhibits osteoclastogenesis and improves bone health. J Nutr Biochem. 2019;70:108–15.
31. Boots AW, Haenen GR, Bast A. Health effects of quercetin: from antioxidant to nutraceutical. Eur J Clin Pharmacol. 2008;64(4):363–71.
32. Khagram R, Mehta CS, Shukla VD, Dave AR. Clinical effect of Matra Basti and Vatari Guggulu in the management of Amavata (rheumatoid arthritis). Ayu. 2010;31(3):343–50.