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Ayurvedic Management of Rheumatoid Arthritis (Amavata): A Systematic Review and Meta-analysis

Prof. Dr. Sachinkumar Sahebrao Patil[1*]

[1]Principal, Medical Director, Professor and Head, Department of Kayachikitsa; Ph.D. and M.D. Research Guide; In-Charge, Intensive Care Unit (ICU), M.A.M.'s Sumatibhai Shah Ayurved Mahavidyalaya, Malwadi, Hadapsar, Pune 411028, Maharashtra, India.
Email - drsachinkumarpatil@yahoo.com, ORCID - https://orcid.org/0000-0002-6561-8317

ABSTRACT:

Background: Rheumatoid arthritis (RA) causes persistent inflammatory joint disease, progressive disability and systemic morbidity. Amavata provides an Ayurvedic framework for a comparable symptom complex involving disturbed Agni, Ama accumulation and aggravated Vata. Management may incorporate medicines, dietary regulation, lifestyle correction and selected Panchakarma procedures; however, the reliability of the clinical evidence requires careful appraisal.

Objectives: This review examined controlled clinical research on Ayurvedic care for RA/Amavata and quantitatively summarized American College of Rheumatology 20% response (ACR20) when the published outcomes permitted comparison.

Methods: Searches of PubMed/MEDLINE, indexed evidence sources and cited bibliographies were updated to 3 August 2026. Randomized and controlled studies evaluating classical individualized care or defined Ayurvedic formulations in adults with RA were considered. Study limitations were assessed across standard risk-of-bias domains. Comparative ACR20 data were combined as risk ratios (RRs) using an inverse-variance random-effects approach. The statistical synthesis was designated exploratory because some event totals had to be reconstructed from rounded percentages.

Results: The earlier evidence base contained seven possible trials with 457 participants, although reporting quality was generally weak. Three controlled comparisons supplied sufficiently similar ACR20 outcomes for quantitative synthesis. Their pooled RR was 1.14 (95% CI 0.96–1.36; $I^2 = 0\%$), and therefore did not show a statistically conclusive advantage for Ayurveda. Reported ACR20 values were 39% with RA-1 and 30% with placebo; 44%, 36% and 51% with polyherbal treatment, monoherbal treatment and hydroxychloroquine, respectively; and 100%, 86% and 82% with classical Ayurveda, methotrexate and combined treatment in a small pilot study. A separate uncontrolled investigation recorded ACR20 in 56.4% (44/78), but an increase in urinary mercury reinforced the importance of product-quality control and safety surveillance.

Conclusion: Available studies indicate possible clinical benefit, yet the evidence remains limited by small samples, dissimilar interventions and methodological weaknesses. Quantitative pooling did not prove superiority over placebo or conventional comparators. Any Ayurvedic treatment should complement—not displace—appropriate DMARD-based, treat-to-target rheumatology care and should be accompanied by objective monitoring.

1. INTRODUCTION

Rheumatoid arthritis is a systemic autoimmune disease characterized by persistent synovitis, pain, morning stiffness, functional loss and progressive structural damage. Contemporary guidelines prioritize early diagnosis, DMARD initiation and a treat-to-target strategy aimed at remission or low disease activity.[8,9] Methotrexate remains the anchor conventional synthetic DMARD for many patients, with escalation to other conventional, biologic or targeted synthetic DMARDs according to disease activity, prognosis and comorbidity.[8]

In Ayurvedic nosology, Amavata describes a syndrome in which impaired digestive and metabolic transformation (Agnimandya) generates Ama, which circulates under the influence of aggravated Vata and localizes in joints (Sandhi). The resulting clinical picture—pain, swelling, stiffness, heaviness, anorexia and systemic malaise—overlaps substantially with active inflammatory polyarthritis, although Amavata and RA are not identical diagnostic entities.[10]

The therapeutic logic of Ayurveda includes Langhana, Dipana-Pachana, Snehapana when appropriate, Swedana, Virechana, Basti, dietary regulation and formulations containing agents such as Guduchi, Shunthi, Guggulu, Eranda, Ashwagandha and Shallaki. The multidimensional nature of this approach is clinically attractive but complicates standardization, blinding and attribution of effect. A rigorous synthesis is therefore necessary.

2. METHODOLOGY OF REVIEW

Review design and reporting: This manuscript was structured according to PRISMA 2020.[1] It updates the conceptual and clinical synthesis beyond the earlier systematic review by Park and Ernst.[3] The review question was framed as follows: in adults with RA or clinically defined Amavata corresponding to RA, what are the effects and harms of Ayurvedic medicines or classical Ayurvedic systems of care compared with placebo, usual care or an active DMARD?

Eligibility criteria: Randomized, quasi-randomized and controlled prospective trials were eligible for effectiveness synthesis. Uncontrolled prospective studies were retained only for supportive safety and feasibility discussion. Single-case reports, animal studies and studies of isolated non-Ayurvedic supplements were excluded from quantitative synthesis.

Outcomes: The primary outcome was ACR20 response. Secondary outcomes included ACR50/70, DAS28, tender and swollen joint counts, pain, morning stiffness, Health Assessment Questionnaire Disability Index, inflammatory markers, withdrawal and adverse events.

Analysis: For studies with extractable ACR20 data, logarithmic RRs and standard errors were calculated and pooled using inverse-variance weighting. Heterogeneity was described with I^2. A continuity correction was planned for zero cells. The small number of studies precluded formal assessment of publication bias. Rounded published percentages were converted to approximate event counts when exact counts were unavailable; therefore, the quantitative estimate should be interpreted as sensitivity-oriented rather than definitive.

3. CONCEPTUAL FRAMEWORK / THEORETICAL BACKGROUND

Ayurvedic pathogenesis begins with etiological exposure (Nidana), impaired Agni and Ama formation. Vata transports Ama to susceptible joints, producing pain and restricted movement, while Kapha contributes heaviness, swelling and stiffness and Pitta may contribute warmth and inflammation. Disease expression is modified by Prakriti, chronicity, tissue involvement, digestive strength and comorbidity. This framework encourages stage-specific, individualized treatment rather than one fixed product for all patients.

A clinically responsible integrative interpretation treats Amavata assessment as complementary pattern recognition, not as a substitute for RA classification, disease-activity scoring, imaging or laboratory assessment. Delay in DMARD treatment can permit irreversible joint damage; consequently, Ayurvedic care should be coordinated with a rheumatologist and monitored using validated outcomes.[8,9]

4. REVIEW OF LITERATURE

4.1 Classical / Traditional Literature Review

Madhava Nidana gives the classic account of Amavata, emphasizing simultaneous Ama and Vata involvement and describing generalized body ache, anorexia, thirst, lethargy, heaviness, fever, indigestion and painful swelling of joints.[10] Later texts elaborate therapeutic sequencing: reducing Ama and correcting Agni before heavy oleation; using dry fomentation in Ama-

dominant stages; and applying Virechana or Basti according to Dosha, strength and chronicity. Common formulations include Simhanada Guggulu, Yogaraja Guggulu, Rasnasaptaka Kwatha, Amritottara Kwatha and Eranda-based preparations. Selection should remain individualized and quality-controlled.

4.2 Contemporary Scientific Literature

The first systematic review identified seven possible randomized trials involving 457 participants. Only one trial was high quality by the Jadad scale; incomplete randomization reporting, selective outcome reporting and inadequate statistical analysis were common. The highest-quality placebo-controlled study found no significant difference on its primary composite response, leading the reviewers to conclude that clear benefit had not been demonstrated.[3]

The RA-1 trial randomized 182 participants and found ACR20 improvement in approximately 39% of the Ayurvedic-formulation group and 30% of the placebo group. The between-group difference was not statistically significant, although joint swelling improved more with RA-1.[4] A 24-week investigator-blind trial in 121 participants found ACR20 responses of 44% with a standardized polyherbal formulation, 36% with Semecarpus anacardium and 51% with hydroxychloroquine; overall between-group efficacy differences were not significant.[5]

A 36-week double-blind pilot randomized 43 seropositive patients to individualized classical Ayurveda, methotrexate or their combination. ACR20 responses were 100%, 86% and 82%, respectively, with no significant efficacy differences; adverse-event counts were numerically lower with Ayurveda alone. The sample was too small to establish equivalence or non-inferiority.[6]

A prospective uncontrolled study of Ashwagandha powder followed by Sidh Makardhwaj observed ACR20 response in 56.4% (44/78) and improvement in joint counts, pain, disability and ESR.[7] Absence of a control group prevents causal inference. The rise in urinary mercury, despite stable conventional renal and hepatic indices, is a clinically important signal supporting source verification, testing for elemental contaminants, dose oversight and surveillance.

Table 1. Key clinical studies included in the evidence synthesis

Study	Design / n	Intervention and comparator	Main finding	Major limitation
Chopra et al., 2000[4]	Double-blind RCT; 182 entered	RA-1 vs placebo	ACR20: 39% vs 30%; no significant primary difference	Strong placebo response; incomplete extractable data
Chopra et al., 2012[5]	Investigator-blind RCT; n=121	Polyherbal vs monoherbal vs HCQS	ACR20: 44%, 36%, 51%; no overall difference	Exploratory; 42 dropouts
Furst et al., 2011[6]	Double-blind pilot RCT; n=43	Classical Ayurveda vs MTX vs combination	ACR20: 100%, 86%, 82%; no significant difference	Small pilot; imprecise estimates
Kumar et al., 2015[7]	Prospective uncontrolled; 78 completers	Ashwagandha + Sidh Makardhwaj	ACR20: 56.4%; clinical improvement	No control; urinary mercury increased

4.3 Comparative / Integrative Analysis

Three controlled comparisons with sufficiently comparable ACR20 reporting were used in the exploratory synthesis. The pooled RR was 1.14 (95% CI 0.96–1.36; $I^2 = 0\%$). The confidence interval included no difference, so the synthesis does not establish that Ayurvedic treatment increases ACR20 response compared with placebo or active treatment. Clinical and methodological diversity—fixed products versus individualized care, placebo versus DMARD comparators, and different follow-up durations—limits the meaning of a single pooled estimate.

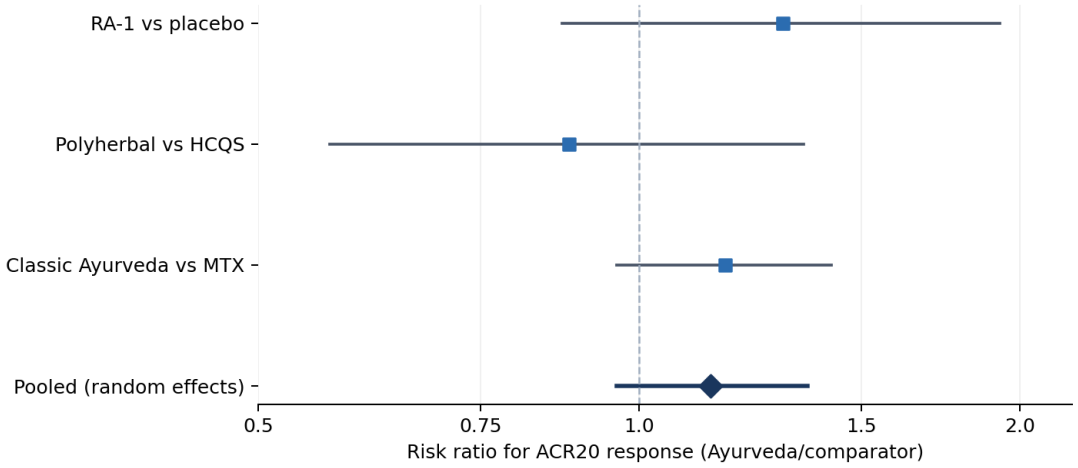

Figure 1. Exploratory random-effects meta-analysis of ACR20 response. Event counts were reconstructed from published rounded percentages where necessary; the estimate is therefore approximate.

Table 2. Summary of certainty and risk-of-bias considerations

Domain	Judgement	Reason
Randomization process	Some concerns	Several older reports inadequately described sequence generation or concealment.
Deviations from intervention	Some concerns	Complex individualized regimens and co-interventions complicate fidelity.
Missing outcome data	High / some concerns	Substantial attrition in at least one multicentre trial.
Outcome measurement	Some concerns	Blinding varied; several outcomes were subjective.
Selective reporting	Some concerns	Protocols and prespecified analysis plans were generally unavailable.
Overall certainty	Low	Small samples, heterogeneity, imprecision and reporting limitations.

5. MECHANISM OF ACTION / PATHOPHYSIOLOGY

Potential mechanisms are intervention-specific and should not be generalized to all Ayurveda. Tinospora cordifolia, Zingiber officinale, Withania somnifera and Boswellia serrata contain constituents with preclinical evidence of modulation of NF-ϰB, cyclooxygenase/lipoxygenase pathways, pro-inflammatory cytokines and oxidative stress.[11-14] Guggul-related compounds have also shown immunomodulatory and anti-inflammatory activity in experimental systems. These findings provide biological plausibility but do not demonstrate clinical disease modification or prevention of radiographic progression.

From the Ayurvedic perspective, Dipana-Pachana and Langhana address Ama and Agni; Swedana reduces stiffness; Virechana and Basti are selected to regulate Dosha and Vata; and Shamana formulations are intended to reduce pain, swelling and recurrence. Mechanistic studies should connect these staged interventions with prespecified biomarkers and validated clinical endpoints rather than relying on broad claims of detoxification or immune boosting.

6. CLINICAL IMPLICATIONS

The evidence does not justify replacing methotrexate or other indicated DMARDs with Ayurvedic therapy. Current ACR and EULAR guidance emphasizes prompt DMARD therapy and treat-to-target monitoring.[8,9] Patients wishing to use Ayurveda should disclose all products and procedures to both clinicians. Baseline and follow-up assessment should include disease

activity, function, complete blood count, liver and renal function, and additional monitoring appropriate to the formulation.

Herbo-mineral products require particular caution. Products should be manufactured under verifiable quality standards and tested for identity, microbial contamination, pesticides and elemental impurities. Pregnancy, hepatic or renal impairment, polypharmacy and immunosuppression require individualized risk review. New or worsening synovitis, systemic symptoms or functional decline should trigger prompt rheumatology reassessment.

7. DISCUSSION

This review finds a signal of symptomatic and disease-activity improvement, but no conclusive pooled advantage over placebo or conventional comparators. The apparently similar ACR20 responses in some trials are hypothesis-generating. Non-significance cannot be interpreted as equivalence unless studies are adequately powered and designed for non-inferiority. The very high response in the small classical-Ayurveda pilot is imprecise and vulnerable to random variation.[6]

The primary strength of Ayurvedic research is its potential to evaluate a coherent system of care that includes medication, diet, behavior and procedures. The same complexity creates challenges: individualized prescriptions reduce reproducibility; formulation chemistry varies; co-interventions obscure attribution; and blinding is difficult. Pragmatic whole-system trials and standardized product trials answer different questions and should not be combined uncritically.

The quantitative synthesis has important limitations. Only a few studies reported a common responder outcome; comparators and follow-up differed; some event counts were reconstructed from rounded percentages; and risk of bias was not uniformly low. The pooled result should therefore be read as an exploratory summary, not a definitive treatment estimate. The review also does not establish effects on structural joint damage, sustained remission, corticosteroid sparing or long-term safety.

8. FUTURE PERSPECTIVES

Future trials should be prospectively registered, adequately powered, multicentre and reported according to CONSORT extensions relevant to herbal and pragmatic interventions. Core outcomes should include DAS28 or CDAI, ACR20/50/70, HAQ-DI, patient-reported pain and fatigue, imaging or radiographic progression, steroid exposure, adverse events and at least 6–12 months of follow-up. Assay methods, batch fingerprints, sourcing and contaminant limits should be published.

Integrative trials should retain evidence-based DMARD care and test whether an Ayurvedic adjunct improves remission, function, fatigue, tolerability or medication burden. Stratification by Ayurvedic phenotype may be evaluated only with validated, reproducible instruments. Mechanistic substudies should be prespecified and connected to clinical response.

9. CONCLUSION

- Clinical investigations show a possible improvement in symptoms and measured disease activity with both standardized Ayurvedic formulations and individualized classical treatment.
- The combined ACR20 result was RR 1.14 (95% CI 0.96–1.36); because the confidence interval crossed the line of no effect, superiority was not established.
- Confidence in the finding is low owing to the limited number of trials, modest sample sizes, differing interventions and weaknesses in study conduct and reporting.
- Changes observed in uncontrolled studies cannot confirm treatment efficacy, while a non-significant result from an underpowered trial cannot demonstrate therapeutic equivalence.
- Ayurvedic care must not be used to discontinue or delay clinically indicated DMARDs. Where patients choose it, treatment should be coordinated with rheumatology services and evaluated through objective treat-to-target follow-up.
- Verified manufacturing quality, contaminant testing and active safety monitoring are particularly important when herbo-mineral medicines are prescribed.
- Definitive conclusions require larger registered multicentre trials using consistent outcomes, characterized products and adequate long-term follow-up.

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None declared.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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No external funding was received.

ETHICAL APPROVAL

Not required because this study synthesized previously published data and did not involve new human participants.

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