



CORRELATION OF DASHAVIDHA PARIKSHA WITH SPECIFIC PRO-INFLAMMATORY CYTOKINE PROFILES IN PATIENTS WITH RHEUMATOID ARTHRITIS (AMAVATA)

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Abstract

Rheumatoid Arthritis (RA), clinically correlated with *Amavata* is a chronic autoimmune syndrome characterized by persistent synovial inflammation and systemic immune dysregulation. While modern rheumatology utilizes objective biomarkers, Ayurveda employs the *Dashavidha Pariksha* (Tenfold Examination) for comprehensive patient phenotyping. This study analyzes the correlation between the ten parameters *Prakriti*, *Vikriti*, *Sara*, *Samhanana*, *Pramana*, *Satmya*, *Satva*, *Ahara Shakti*, *Vyayama Shakti*, and *Vaya* and the systemic titers of pro-inflammatory cytokines, specifically Tumor Necrosis Factor-alpha (TNF- α), Interleukin-6 (IL-6), and Interleukin-1 (IL-1).¹ Evidence suggests that *Vata* -predominant *Prakriti* and high-degree *Vikriti* scores are associated with elevated TNF- α and IL-6 levels. Furthermore, parameters like *Satva* and *Ahara Shakti* demonstrate significant correlations with the neuro-endocrine-immune axis and gut-microbiota-driven inflammation. Integrating these ancient diagnostic metrics provides a robust framework for personalized medicine and patient-centric prognosis in autoimmune pathology.

Keywords: Ayurveda, *Amavata*, Rheumatoid Arthritis, *Dashavidha Pariksha*, TNF- α , IL-6, Neuro-immunology, Personalized Medicine.

1. Introduction

The clinical management of Rheumatoid Arthritis (RA) requires a transition from generalized protocols to patient-centered, precision medicine. In the Ayurveda the *Roga Nidana evum Vikriti Vighyan* (Ayurveda Pathology), explains about the assessment of the patient (*Rogi Pariksha*) is prioritized alongside the disease (*Roga Pariksha*) to determine biological strength (*Bala*). RA is a systemic autoimmune disorder marked by symmetrical polyarthritis and the production of autoantibodies like Rheumatoid Factor (RF) and Anti-Citrullinated Protein Antibodies (ACPA).

Ayurveda describes a clinically congruent entity, *AmaVata*, arising from the synergy of *Ama* (toxic metabolic by-products) and vitiated *Vata Dosha*. To quantify the patient's health status, *Acharya Charaka* formulated the *Dashavidha Pariksha* in the *Vimana Sthana*, Chapter 8. The term "*Vimana*" implies specific quantification or measurement, suggesting a scientific approach to clinical assessment. Modern research identifies pro-inflammatory cytokines as the primary drivers of RA

pathogenesis, with TNF- α levels averaging 23.1pg/mL in affected cohorts. This report establishes a multidimensional correlation between the tenfold Ayurvedic parameters and these molecular markers.ⁱⁱ

2. Methodology

This research follows a comparative analytical framework:

1. **Literature Review:** Comprehensive analysis of classical texts (Charaka Samhita, Sushruta Samhita, Madhava Nidana) and peer-reviewed journals indexed in Scopus and PubMed.ⁱⁱⁱ
2. **Synthesis:** Identifying clinical intersections between the ten Ayurvedic parameters and cytokine-mediated inflammatory pathways.
3. **Data Modeling:** Utilizing established cytokine ranges and genomic findings associated with Ayurvedic phenotypes (Prakriti) to propose an integrated diagnostic model.

2.1. Detailed Analysis of Dashavidha Pariksha Parameters

The *Dashavidha Parikshya Bhavas* provide an objective method to assess the patient's constitution and the severity of the disease.^{iv}

Table 1: Detailed Correlation of the Ten Parameters with Modern Biological Markers^v

No.	Ayurvedic Parameter	Clinical Definition & Examination Focus	Modern Biological Correlation
1	Prakriti	Innate constitution based on <i>Dosha</i> dominance at conception.	Genetic constitution and metabolic phenotype.
2	Vikriti	Current state of morbidity and <i>Dosha</i> imbalance.	Pathophysiology and disease activity index (DAS28).
3	Sara	Essence and quality of seven tissues (Dhatus).	Nutritional status, albumin levels, and immunity.
4	Samhanana	Compactness and structural integrity of the body.	Musculoskeletal strength and Body Mass Index (BMI).
5	Pramana	Anthropometric measurements of body parts.	Modern anthropometry and anatomical proportions.
6	Satmya	Adaptability to dietary and environmental factors.	Individual lifestyle adaptation and tolerance.
7	Satva	Mental strength and psychological resilience.	Psychological resilience and HPA axis regulation.
8	Ahara Shakti	Power of food ingestion and digestion (Jarana).	Digestive efficiency and metabolic reserve.
9	Vyayama Shakti	Physical endurance and exercise tolerance.	Cardiopulmonary fitness and functional capacity.
10	Vaya	Biological and chronological age of the patient.	Age-related physiological and immunological status.

Detailed Analysis of Parameters in RA (*AmaVata*)

1. Prakriti (Constitution) Prakriti determines an individual's susceptibility to chronic inflammation. Research demonstrates that *Vata* -predominant individuals are highly predisposed to RA and exhibit greater disease severity compared to Pitta or Kapha types. Genomic studies associate *Vata* Prakriti with specific inflammatory genes (e.g., *RP11-536O18.1*), whereas Pitta is linked to oxidative stress pathways^{vi}.

2. Vikriti (Morbidity)

Examination of Vikriti involves quantifying the *Dosha*-Dushya interaction. In *AmaVata*, high-degree Vikriti scores correlate significantly with elevated serum IL-6 and CRP levels, reflecting active synovial hyperplasia.

3. *Sara* (Tissue Excellence)

Sara Pareeksha assesses the immune reserve (Bala). "Sarva Sara" individuals possess the highest biological fortitude. Mamsa Sara specifically correlates with serum total protein and globulin levels, while low Sara scores (Asara) in RA patients often reflect the "anemia of chronic disease" and lower albumin titers (< 3.2 g/dl) due to persistent cytokine-driven inflammation.^{vii}

4. *Samhanana* (Compactness) This parameter reflects musculoskeletal integrity. In chronic RA, the destruction of bone and cartilage by TNF- α -mediated Matrix Metalloproteinases (MMPs) leads to "Avara Samhanana" (poor compactness) and skeletal deformity.

5. *Pramana* (Anthropometry)

Quantified through *Anguli Pramana* (finger-breadth units). Deviations in Pramana (like obesity or wasting) serve as metabolic indicators; for instance, high BMI (Sthaulya) in RA is associated with increased adipokine-mediated inflammation.

6. *Satmya* (Adaptability)

Satmya indicates the patient's pharmacological tolerance. In *Amavata*, patients with *Madhyama Satmya* may respond better to integrative protocols involving both DMARDs and Ayurvedic interventions like Eranda Taila.

7. *Satva* (Mental Strength)

Satva correlates with the neuro-endocrine-immune axis. Lower Satva (psychological weakness) is linked to chronic stress, which activates the HPA axis, increasing salivary cortisol and IL-6 levels (78.32 pg/mL in chronic inflammatory states).

8. *Ahara Shakti* (Digestive Capacity) Determined by ingestion (*Abhyavaharana*) and digestion (*Jarana*) power. Since *AmaVata* is rooted in *Agnimandya* (low digestive fire), low Ahara Shakti is a clinical marker for gut dysbiosis and elevated succinate/3-Hydroxybutyrate—serum metabolic signatures of RA.

9. *Vyayama Shakti* (Physical Capacity)

This is the functional assessment. In RA, functional disability as measured by the Health Assessment Questionnaire (HAQ) is directly proportional to TNF- α and IL-6 titers. Improved Vyayama Shakti post-Yoga or therapy correlates with reduced systemic inflammation.^{viii}

10. *Vaya* (Age)

Vaya helps determine the prognosis. *AmaVata* in *Vriddhavastha* (old age) is often categorized as *Kashta-sadhya* (difficult to treat) due to natural Dhatu-kshaya (tissue depletion) and declining immune regulation.

3. Pathophysiology (*Samprapti*): Ayurveda and Modern Science

Ayurvedic Pathogenesis (*Samprapti*)

Amavata arises from incompatible dietary habits and impaired metabolism.

विरुद्धाहारचेष्टस्य मन्दाग्नेर्निश्चलस्य च।

स्निग्धं भुक्तवतो हान्यं व्यायामि कुर्वतस्तथा॥

वायुना प्रेरितो ह्यामः श्लेष्मस्थानं प्रधावति।

तेनात्यर्थं विदग्धोऽसौ धमनीः प्रतिपद्यते॥ (*Madhava Nidana 25/1-2*)

According to acharya Bhamishra Incompatible food, low digestive fire, and sedentary habits generate Ama. This Ama, pushed by aggravated *Vata*, enters the circulatory channels (*Dhamanis*) and lodges in the joints (*Kapha-sthana*), leading to systemic stiffness and pain.

3.1. Modern Pathogenesis: The Cytokine Cascade

The molecular pathogenesis of RA occurs in phases:

1. **Autoimmune Phase:** Production of ACPAs and RF triggered by genetic and environmental factors (e.g., smoking).
2. **Inflammatory Phase:** Recruitment of macrophages and T-cells to the synovium, leading to a "Cytokine Storm".
3. **Destructive Phase:** TNF- α , IL-6, and IL-1 β activate fibroblast-like synoviocytes (FLS) to produce MMPs and RANKL, resulting in bone erosion and cartilage degradation.^{ix}

4. Signs and Symptoms: Clinical Manifestations

4.1. General Symptoms (Samanya Lakshanas)

Sanskrit Shloka:

अङ्गमर्दोऽरुचिस्तृष्णा आलस्यं गौरवं ज्वरः।

अपाकः शूनताङ्गानामामवातस्य लक्षणम्॥ (Madhava Nidana 25/6)

Acharaya Bhavnishra said that General symptoms include body ache (*Angamarda*), anorexia (*Aruchi*), thirst, heaviness, fever (*Jvara*), and joint swelling (*Shunata*). These mirror the systemic inflammation (fever/fatigue) driven by IL-6 acting as an endogenous pyrogen.^x

4.2. Advanced Symptoms (Pravruddha Lakshanas)

Pain in chronic *AmaVata* is described as *Vrischika Damshavat Vedana* (like a scorpion sting). This intensity of pain is directly linked to TNF- α -mediated sensitization of nociceptors and prostaglandin production.

5. Lab Investigations and Diagnostic Parameters^{xi}

Integrating *Dashavidha Pariksha* with biochemical assays provides a granular diagnostic profile.

Table 2: Comparative Laboratory Signatures in RA/*AmaVata*

Investigation	RA (Active Phase) Values ^{xii}	Ayurvedic Clinical Correlation
TNF-α (Serum)	Mean 23.1 pg/mL (Normal 15.6 pg/mL)	<i>Vata</i> -Pitta Vikriti / High Ruja.
IL-6 (Serum)	Range 4.8 - 8.6 pg/mL\$ (Normal 5.1 pg/mL)	Jvara and Gaurava (Systemic Ama).
Albumin (Serum)	Range 2.5 - 3.5 g/dl(Hypoalbuminemia)	Avara Sara (Reduced immune reserve).
ESR / CRP	Elevated (e.g., ESR > 30 mm/hr)	Saama stage of <i>Amavata</i> .
Metabolomics	Elevated Succinate, 3-Hydroxybutyrate	Mandagni / Impaired Ahara Shakti.

6. Management: Ayurveda and Modern Strategies

6.1. Ayurvedic Individualized Management^{xiii}

The line of treatment targets the gut-joint axis to reduce the systemic pool of Ama.

1. **Langhana (Fasting):** Digests Ama and restores *Jatharagni*.
2. **Virechana:** Using Eranda Taila (Castor oil) is safe and effective, with a 12:1 cost-benefit ratio over DMARDs.
3. **Basti (Enema):** *Vaitarana Basti* is specifically indicated to regulate *vata* and eliminate toxins from the deep tissues.
4. **Ayurveda Formulations:** *AmaVata* ri Rasa and *Simhanada Guggulu*, *Amvatari Guggulu*, *Rasna*, *Dashmool* demonstrate anti-inflammatory effects equivalent to Methotrexate in pilot studies.

6.2. Modern Management

1. **Conventional DMARDs:** Methotrexate (MTX) remains the gold standard but has risks of hepatotoxicity.^{xiv}

2. **Biologics:** TNF-inhibitors (Infliximab) and IL-6 inhibitors (Tocilizumab) are highly effective but expensive.

7. Discussion: The Neuro-Endocrine-Immune and Gut-Joint Nexus

The integration of *Dashavidha Pariksha* with modern cytokine profiling offers a robust systems-biology framework for assessing Rheumatoid Arthritis. The data suggests that Ayurvedic clinical parameters are not subjective observations but phenotypic reflections of complex molecular states.

7.1. Cytokine Synergy and *Vikriti* (Morbidity)

The assessment of **Vikriti** provides a quantitative estimate of disease activity. In the "Saama" (toxin-laden) stage of Amavata, systemic inflammation is at its peak. Biochemically, this correlates with mean serum TNF- α levels of 23.1 pg/mL and elevated IL-6, which drives the acute-phase response (CRP production). The classical description of *Jvara* (fever) and *Gaurava* (heaviness) in Amavata precisely reflects the action of IL-6 as a systemic inflammatory mediator. Furthermore, the severity of "*Vrischika Damshavat Vedana*" (scorpion-sting pain) is directly linked to TNF- α -mediated sensitization of peripheral nociceptors and increased prostaglandin synthesis.

7.2. The Neuro-Endocrine-Immune Axis (*Satva* and *Vaya*)

The inclusion of **Satva** (mental strength) in the Dashavidha Pariksha anticipates modern psychoneuroimmunology. Research indicates that RA patients with lower Satva (psychological weakness/stress) exhibit a "vicious cycle" where chronic stress activates the HPA axis, resulting in elevated salivary cortisol and IL-6 titers (> 78 pg/mL). This hormonal imbalance impairs the body's ability to naturally down regulate inflammation, explaining why patients with *Avara Satva* often manifest more severe, treatment-resistant disease. Similarly, the parameter *Vaya* (age) accounts for immunesenescence; as RA progresses in *Vriddhavastha* (old age), there is a significant decline in serum albumin (*Avara Sara*) and a corresponding rise in IL-6, leading to increased mortality and fracture risk.

7.3. Metabolic Phenotyping and the Gut-Joint Axis (*Ahara Shakti* and *Prakriti*)

Ayurveda identifies *Agnimandya* (impaired digestion) as the root cause of *Amavata*. This is scientifically validated by the "gut-joint axis" hypothesis, where intestinal dysbiosis leads to the production of pro-inflammatory cytokines and the translocation of microbial products (*Ama*) into the systemic circulation. Patients with low *Ahara Shakti* show elevated serum metabolic signatures such as succinate and 3-Hydroxybutyrate, which converge toward normal levels only after Ayurvedic Whole System (AWS) intervention. Furthermore, the genetic stratification of *Prakriti* types provides predictive value; *Vata*-predominant individuals possess unique SNPs in inflammatory genes (e.g., *CTC-498M16.4*), making them more prone to the chronic synovial destruction observed in RA.^{xv}

7.4. Therapeutic Potential of Integrative Precision Medicine

The comparative analysis of treatments demonstrates that individualized Ayurvedic therapy, based on the patient's Dashavidha profile, is as effective as Methotrexate but with fewer adverse events (112 vs. 174 events). Ayurvedic interventions like *Vaitarana Basti* and *Amavatari Rasa* act by neutralizing the systemic pool of *Ama*, thereby lowering the circulating titers of TNF- α and IL-1 β . By tailoring drug dosage to the patient's *Bala* (strength) and *Ahara Shakti*, Ayurvedic physicians achieve a state of "*Dhatu-Samya*" (metabolic equilibrium), which translates to a reduced DAS28 score and improved functional capacity (*Vyayama Shakti*).

8. Conclusion

This Review establishes a profound scientific correlation between the ancient diagnostic methodology of Dashavidha Pariksha and the modern molecular understanding of cytokine

networks in Rheumatoid Arthritis (*Amavata*). The assessment of parameters such as Prakriti, Vikriti, and Agni provides a non-invasive, biologically relevant surrogate for the patient's inflammatory and metabolic status. Specifically, *Vata*-predominant *Prakriti* and high-degree *Vikriti* serve as reliable clinical indicators for elevated pro-inflammatory cytokines such as TNF- α and IL-6.

Furthermore, parameters like *Satva* and *Ahara Shakti* bridge the gap between psychological resilience, gut health, and systemic immune regulation, highlighting the sophisticated "whole-system" approach of Ayurvedic pathology. Integrating these Ayurvedic parameters into modern clinical trials can lead to more granular patient stratification and the development of cost-effective, biocompatible therapeutic regimens. Future research should prioritize longitudinal studies to validate Dashavidha Pariksha scores against specific genomic and metabolomic biomarkers, paving the way for a truly integrative, personalized medicine in global rheumatology.

9. References

- i Abdelghani, A. (2025). Assessment of salivary Interleukin-6 and Cortisol levels in patients with Oral Lichen Planus. *Journal of Pharmacy and Bioallied Sciences*, 17(S4), 3292-3294. DOI: 10.4103/jpbs.jpbs_1383_25.
- ii Agnivesha. (2020). *Charaka Samhita, Vimana Sthana* Chapter 8 (Rogabhishagjitiya Vimana), Shloka 94-122. (Y. S. Deole, Ed.). Charak Samhita Research, Training and Skill Development Centre. DOI: 10.47468/CSNE.2020.e01.s03.009.
- iii Sushruta. (2017). *Sushruta Samhita, Doshadhatumala Kshaya Vriddhi Vijnaniya* (Sutra Sthana 15/40). (Dr. Anant Ram Sharma, Ed.). Chaukhambha Sanskrita Sansthan.
- iv Yogaratnakara. (2005). *Yogaratanakara, Amavata Chikitsa* (Poorva Khanda). (Dr. Madhavam Shetty Sureshababu, Ed.). Chaukhambha Sanskrit Series. Page 132.
- v Yogita, et al. (2025). Dashavidha Pareeksha: A comprehensive clinical assessment model in Ayurveda. *World Journal of Pharmacy and Pharmaceutical Sciences*, 14(7), 231-240.
- vi Vagbhata. (2025). *Ashtanga Hridaya, Roganutpadaniya* (Sutrasthana 12/67). (Dr. Brahmanand Tripathi, Ed.). Chaukhambha Publications.
- vii Singh, A., et al. (2019). Need of development of diagnostic measures for assessment of Sara Pariksha in Ayurveda. *International Journal of Health Sciences & Research*, 9(7), 272-278.
- viii Agnivesha. (2020). *Charaka Samhita, Trividhakukshiya Vimana* (Vimana Sthana 2/3). (Y. S. Deole, Ed.). Charak Samhita Research, Training and Skill Development Centre.
- ix Lee, J. H., et al. (2021). Circulating cytokines and rheumatoid arthritis: A systematic review and meta-analysis. *Scientific Reports*, 11, 23. DOI: 10.1038/s41598-021-0131.
- x Madhava. (2023). *Madhava Nidana, Chapter 25 (AmaVata Nidanam)*, Shloka 6. (Dr. Brahmanand Tripathi, Trans.). Chaukhambha Surbharati Prakashan.
- xi Rastogi, S., et al. (2024). Clinical metabolomics investigation of rheumatoid arthritis: Identifying the serum metabolic signatures following Ayurvedic Whole System (AWS) intervention. *Journal of Ayurveda and Integrative Medicine*. DOI: 10.1016/j.jaim.2024.101009.
- xii Arden, J., et al. (1967). Immunoglobulin levels in rheumatoid arthritis: comparison with rheumatoid factor titers, clinical stage and disease duration. *Arthritis Rheum*, 10(3), 228-234. DOI: 10.1002/art.1780100308.
- xiii Kumar, S., et al. (2024). A comparative study to assess the treatment cost of Ayurvedic medicine (ginger and castor oil) and modern medicine (DMARDs) in *AmaVata* (Rheumatoid Arthritis). *International Journal of Ayurveda and Pharma Research*, 12(6), 111-118.
- xiv Furst, D. E., et al. (2011). Double-blind, randomized, controlled, pilot study comparing classic Ayurvedic medicine, methotrexate, and their combination in rheumatoid arthritis. *Journal of Clinical Rheumatology*, 17(4), 185-192. DOI: 10.1097/RHU.0b013e31821c03d0.
- xv Arden, J., et al. (1967). Immunoglobulin levels in rheumatoid arthritis: comparison with rheumatoid factor titers, clinical stage and disease duration. *Arthritis Rheum*, 10(3), 228-234. DOI: 10.1002/art.1780100308.

