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“ROLE OF ARTIFICIAL INTELLIGENCE IN THE AYURVEDA SYSTEM OF MEDICINE: A CLINICAL PERSPECTIVE”

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Abstract:

Artificial Intelligence (AI) is rapidly transforming healthcare by improving diagnostic accuracy, treatment personalization, clinical decision-making, and disease prediction. Ayurveda, a patient-centered and individualized system of medicine, possesses vast clinical knowledge that can benefit significantly from AI-driven technologies. The integration of AI with Ayurvedic principles offers opportunities for objective assessment of Prakriti, improved diagnostic support, predictive disease modeling, digital health records, clinical research, and evidence-based validation of traditional practices. This review explores the clinical applications of AI in Ayurveda, highlighting its potential to enhance patient care, strengthen research methodologies, and facilitate integration with contemporary healthcare systems.

Keywords: Artificial Intelligence, Ayurveda, Clinical Decision Support, Prakriti, Personalized Medicine, Machine Learning, Digital Health.

INTRODUCTION

Ayurveda is one of the oldest systems of medicine and emphasizes individualized healthcare based on a patient's constitution (Prakriti), disease status, lifestyle, and environmental factors. Clinical decision-making in Ayurveda requires comprehensive evaluation of Dosha, Dhatu, Mala, Agni, Srotas, and Roga-Rogi Bala. However, variability in clinical interpretation and the increasing demand for evidence-based healthcare have created a need for technological support systems. Artificial Intelligence, which encompasses machine learning, deep learning, expert systems, and natural language processing, has emerged as a promising tool to improve the accuracy, consistency, and efficiency of healthcare delivery.¹

The convergence of AI and Ayurveda provides an opportunity to transform traditional knowledge into clinically actionable information while preserving the holistic philosophy of Ayurvedic medicine.²

AI and Personalized Ayurvedic Clinical Practice

Personalization is the cornerstone of Ayurvedic treatment. Determination of Prakriti is essential for preventive

strategies, dietary recommendations, and therapeutic planning. Traditionally, Prakriti assessment depends upon physician expertise and subjective interpretation.

AI-based algorithms can analyze phenotypic characteristics, clinical parameters, genetic markers, and patient-reported information to classify Prakriti with greater consistency and reproducibility. Machine learning models are capable of identifying complex patterns among Vata, Pitta, and Kapha attributes, thereby assisting clinicians in formulating individualized treatment plans.³

Such systems may reduce inter-observer variation and enhance standardization in clinical Ayurvedic practice.

AI-Assisted Clinical Diagnosis in Ayurveda

Accurate diagnosis forms the basis of successful treatment. In Ayurveda, diagnosis involves Dashavidha Pariksha, Ashtavidha Pariksha, Nadi Pariksha, and detailed clinical examination.

Artificial intelligence can support clinicians through:

- Automated symptom analysis
- Pattern recognition from clinical datasets
- Digital tongue image interpretation
- Pulse waveform analysis
- Predictive disease classification

AI-driven diagnostic platforms can process large amounts of patient information and identify disease patterns that may not be immediately evident through conventional assessment. Such systems can assist Ayurvedic physicians in diagnosing disorders at an earlier stage and improve clinical decision-making.⁴

AI in Nadi Pariksha and Digital Biomarker Development

Nadi Pariksha remains one of the most distinctive diagnostic methods in Ayurveda. However, its interpretation often varies among practitioners.

Modern sensor technologies combined with machine learning algorithms can capture pulse waveforms and analyze physiological signals objectively. AI models can classify pulse characteristics associated with Vata, Pitta, and Kapha predominance and generate reproducible clinical outputs. These technologies may improve the scientific validation and

standardization of pulse diagnosis in clinical settings.⁵

Predictive Analytics and Preventive Healthcare

Ayurveda places strong emphasis on prevention rather than disease management alone. The principles of Swasthavritta and Dinacharya are aimed at maintaining health and preventing illness.

AI-based predictive analytics can utilize clinical, behavioral, dietary, and environmental data to identify individuals at risk of developing chronic diseases.

Risk prediction models may facilitate early intervention through personalized lifestyle modification, Ayurvedic counseling, and preventive therapies. Such approaches align closely with the Ayurvedic objective of preserving health before disease manifests.⁶

AI in Ayurvedic Treatment Planning

Selection of appropriate treatment modalities in Ayurveda depends on multiple factors including Dosha involvement, disease stage, strength of the patient, and associated systemic conditions.

Clinical decision-support systems powered by AI can assist practitioners by:

- Recommending evidence-based treatment protocols
- Identifying suitable Panchakarma procedures
- Suggesting individualized dietary regimens
- Monitoring treatment outcomes
- Predicting therapeutic response

These systems can serve as supportive tools for physicians while maintaining the final clinical judgment in the hands of qualified practitioners.⁷

AI in Panchakarma Outcome Assessment

Assessment of Panchakarma efficacy traditionally relies on clinical observation and symptom improvement. AI-enabled digital monitoring systems can evaluate objective outcome measures such as physiological parameters, biochemical markers, patient-reported outcomes, and quality-of-life indicators.

Continuous data collection allows clinicians to monitor treatment progress in real time and optimize therapeutic interventions. Such approaches may contribute significantly to evidence generation in Panchakarma research.⁸

AI in Ayurvedic Drug Discovery and Pharmacovigilance

The Ayurvedic pharmacopeia contains thousands of medicinal formulations derived from plant, mineral, and animal sources. Identifying active constituents and understanding mechanisms of action remain major research challenges.

Artificial intelligence accelerates drug discovery by:

- Screening phytochemicals
- Predicting molecular interactions
- Identifying therapeutic targets
- Evaluating toxicity profiles
- Supporting formulation optimization

Additionally, AI-based pharmacovigilance systems can monitor adverse drug reactions and improve medication safety in Ayurvedic clinical practice.⁹

AI in Clinical Research and Evidence Generation

One of the major challenges facing Ayurveda is the generation of high-quality clinical evidence. AI can significantly strengthen research methodology by facilitating:

- Large-scale clinical data analysis
- Patient stratification
- Outcome prediction

- Meta-analysis and systematic reviews
- Real-world evidence generation
- Variability in Ayurvedic diagnostic methods
- Limited digitization of clinical records

Machine learning techniques can uncover hidden associations within clinical datasets and provide insights into treatment effectiveness across diverse patient populations.¹⁰

Tele-Ayurveda and Remote Patient Monitoring

The expansion of telemedicine has increased access to healthcare services. AI-powered virtual platforms can support remote Ayurvedic consultations by collecting patient histories, assessing symptoms, scheduling follow-ups, and monitoring treatment adherence.

Wearable devices integrated with AI may track sleep patterns, heart rate variability, physical activity, and stress levels, enabling continuous patient monitoring and personalized health recommendations.¹¹

Challenges in Clinical Integration

Despite its potential, AI implementation in Ayurveda faces several challenges:

- Lack of standardized clinical datasets

- Ethical concerns regarding patient privacy
- Need for interdisciplinary collaboration
- Requirement for regulatory frameworks

Addressing these challenges is essential to ensure reliable and clinically meaningful AI applications within Ayurvedic healthcare.¹²

Future Directions

Future AI applications in Ayurveda may include intelligent clinical decision-support systems, automated Prakriti assessment platforms, AI-assisted Panchakarma monitoring, precision Ayurvedic medicine, and integration of genomic data with traditional constitutional analysis.

Collaborative efforts among Ayurvedic physicians, biomedical researchers, data scientists, and healthcare policymakers will be critical for developing clinically validated and ethically responsible AI solutions.¹³

Conclusion

Artificial Intelligence has the potential to revolutionize the clinical practice of Ayurveda by enhancing diagnostic accuracy, standardizing Prakriti assessment, supporting treatment planning, improving preventive healthcare, and strengthening clinical research. Rather than replacing traditional clinical expertise, AI serves as an advanced decision-support tool that complements Ayurvedic principles and facilitates evidence-based practice. Responsible integration of AI with Ayurveda may pave the way for a more personalized, predictive, preventive, and participatory healthcare system in the future.

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References

1. Jiang F, Jiang Y, Zhi H, Dong Y, Li H, Ma S, et al. Artificial intelligence in healthcare: past, present and future. *Stroke Vasc Neurol*. 2017;2(4):230–243.
2. Patwardhan B, Mashelkar RA. Traditional medicine-inspired approaches to drug discovery: can Ayurveda show the way forward? *Drug Discov Today*. 2009;14(15-16):804–811.
3. Rotti H, Raval R, Anchan S, Bellampalli R, Bhale S, Bharadwaj R, et al. Determinants of Prakriti, the human constitution types of Ayurveda. *J Ayurveda Integr Med*. 2014;5(1):3–8.
4. Topol EJ. High-performance medicine: the convergence of human and artificial intelligence. *Nat Med*. 2019;25(1):44–56.
5. Sahoo S, Manchikanti P. Artificial intelligence applications in pulse signal analysis and healthcare diagnostics. *Biomed Signal Process Control*. 2021;68:102610.
6. Beam AL, Kohane IS. Big data and machine learning in healthcare. *JAMA*. 2018;319(13):1317–1318.

7. Davenport T, Kalakota R. The potential for artificial intelligence in healthcare. *Future Healthc J.* 2019;6(2):94–98.
8. Shailaja U, Rao PN, Arun Raj GR. Clinical evaluation methods in Panchakarma research: current perspectives and future opportunities. *J Res Ayur Siddha.* 2018;39(2):87–95.
9. Paul D, Sanap G, Shenoy S, Kalyane D, Kalia K, Tekade RK. Artificial intelligence in drug discovery and development. *Drug Discov Today.* 2021;26(1):80–93.
10. Deo RC. Machine learning in medicine. *Circulation.* 2015;132(20):1920–1930.
11. Bashshur RL, Shannon GW, Krupinski EA, Grigsby J. The empirical foundations of telemedicine interventions in primary care. *Telemed J E Health.* 2016;22(5):342–375.
12. Mesko B, Hetenyi G, Gyorffy Z. Will artificial intelligence solve the human resource crisis in healthcare? *BMC Health Serv Res.* 2018;18(1):545.
13. Mathur S, Sharma P, Singh GN. Emerging opportunities for integrating artificial intelligence and Ayurveda in precision healthcare. *J Ayurveda Integr Med.* 2023;14(3):100715.