Can AI Detect Endometriosis? The Digital Frontier in Women's Health

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Abstract

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Endometriosis, a chronic and often debilitating condition where tissue similar to the uterine lining grows outside the uterus, affects an estimated 10% of women of reproductive age globally [1]. Despite its prevalence, the diagnostic journey is notoriously long, with patients often waiting an average of **6 to 10 years** for a definitive diagnosis [2] [3]. This significant diagnostic delay is a major public health challenge, leading to prolonged suffering and delayed treatment. In this context, the integration of **Artificial Intelligence (AI)** and **Machine Learning (ML)** into clinical practice offers a transformative potential to revolutionize the detection and diagnosis of this complex disease.

The Challenge of Endometriosis Diagnosis

The current gold standard for diagnosing endometriosis remains **laparoscopy**, an invasive surgical procedure [1]. Non-invasive methods, such as transvaginal ultrasound and MRI, can detect advanced stages, but their sensitivity for early or subtle lesions is limited. The symptoms—including chronic pelvic pain, dysmenorrhea, and dyspareunia—are often non-specific, leading to misdiagnosis or dismissal of patient concerns. The need for a reliable, non-invasive, and rapid diagnostic tool is paramount.

AI and Machine Learning: A New Screening Approach

The core promise of AI in endometriosis lies in its ability to process vast, complex datasets—including clinical histories, symptom profiles, imaging data, and even genetic markers—to identify subtle patterns invisible to the human eye. Machine learning algorithms are being trained on these multimodal data sources to develop predictive models for early detection [4].

Research has shown promising results across several applications:

1. **Symptom-Based Prediction:** ML models trained on self-reported symptoms and clinical features have demonstrated a good capacity to predict the likelihood of endometriosis, offering a potential non-invasive screening tool [5]. This approach could significantly reduce the initial diagnostic delay by flagging high-risk patients earlier. 2. **Image Analysis:** AI-augmented imaging techniques, particularly for ultrasound and MRI, are improving the detection of endometriomas and deep infiltrating endometriosis (DIE) [6]. AI algorithms can analyze scans to recognize patterns indicative of the disease with high accuracy, sometimes comparable to or exceeding human specialists [7]. 3. **Non-Invasive Biomarkers:** Emerging research is exploring the use of AI to analyze non-invasive samples, such as saliva or blood, for specific biomarkers. For instance, one commercialized technology, the Ziwig EndotestR, uses AI to analyze microRNAs in saliva, offering a potential non-surgical diagnostic pathway [8].

Can AI Replace the Doctor?

While the progress is rapid and exciting, the answer to "Can AI detect endometriosis?" is a nuanced **"Not yet, but it can powerfully assist."** AI models are currently best viewed as sophisticated diagnostic aids, not replacements for clinical judgment.

A scoping review on the clinical use of AI in endometriosis highlighted that while AI models show good diagnostic and predictive capacity, they must be applied carefully and transparently [7]. The technology faces challenges related to data quality, the need for large, diverse datasets for training, and the ethical implications of algorithmic bias in women's health. The ultimate goal is a **Human-AI collaborative model** that leverages the algorithm's pattern recognition strength with the clinician's expertise and patient context [9].

For more in-depth analysis on this topic, including the ethical considerations of digital health in chronic disease management, the resources at www.rasitdinc.com provide expert commentary and a comprehensive look at the future of AI in medicine.

The Future of Endometriosis Care

The digital transformation of endometriosis care is focused on reducing the diagnostic gap and improving patient outcomes. The future will likely involve a multi-pronged approach:

AI-Powered Screening Apps: Utilizing ML on patient-reported data to triage and fast-track high-risk individuals. **Integrated Imaging Platforms:** AI systems embedded in ultrasound and MRI machines to provide real-time diagnostic support. ***Biomarker Analysis:*** *Non-invasive tests that use AI to interpret complex molecular data.*

By embracing these technologies, the medical community can move closer to a future where endometriosis is diagnosed swiftly, non-invasively, and with greater precision, finally addressing the decades-long diagnostic delay that

has plagued millions of patients.

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References

[1] World Health Organization. Endometriosis. [2] P De Corte. Time to Diagnose Endometriosis: Current Status, Challenges and Future Directions. BJOG: An International Journal of Obstetrics & Gynaecology*, 2025. [3] AJ Penzer. Using Policy and Law to Help Reduce Endometriosis Diagnostic Delay.* Journal of Ethics*, 2025. [4] N Zhao. Application of machine learning techniques in the diagnosis of endometriosis.* BMC Women's Health*, 2024. [5] S Bendifallah. Machine learning algorithms as new screening approach for patients with endometriosis.* Scientific Reports*, 2022. [6] T Zhao. Recent Advancements of Artificial Intelligence in Minimally Invasive Gynecologic Surgery.* Journal of Minimally Invasive Gynecology*, 2025. [7] B Sivajohan. Clinical use of artificial intelligence in endometriosis: a scoping review.* NPJ Digital Medicine*, 2022. [8] Advances in non-invasive diagnostic tools for endometriosis.* International Journal of Gynecology & Obstetrics*, 2025. [9] H Wang. Human-AI collaborative multi-modal multi-rater learning for endometriosis.* PubMed*, 2024.