**29. Machine learning algorithms as new screening approach for patients with endometriosis**

**Sofiane Bendifallah 1 2 3, Anne Puchar 4 5, Stéphane Suisse 6, Léa Delbos 7 8, Mathieu Poilblanc 9 10, Philippe Descamps 7 8, Francois Golfier 9 10, Cyril Touboul 4 5, Yohann Dabi 4 5, Emile Daraï 4 5
Sci Rep. 2022 Jan 12;12(1):639.doi: 10.1038/s41598-021-04637-2.**

Abstract

Endometriosis-a systemic and chronic condition occurring in women of childbearing age-is a highly enigmatic disease with unresolved questions. While multiple biomarkers, genomic analysis, questionnaires, and imaging techniques have been advocated as screening and triage tests for endometriosis to replace diagnostic laparoscopy, none have been implemented routinely in clinical practice. We investigated the use of machine learning algorithms (MLA) in the diagnosis and screening of endometriosis based on 16 key clinical and patient-based symptom features. The sensitivity, specificity, F1-score and AUCs of the MLA to diagnose endometriosis in the training and validation sets varied from 0.82 to 1, 0-0.8, 0-0.88, 0.5-0.89, and from 0.91 to 0.95, 0.66-0.92, 0.77-0.92, respectively. Our data suggest that MLA could be a promising screening test for general practitioners, gynecologists, and other front-line health care providers. Introducing MLA in this setting represents a paradigm change in clinical practice as it could replace diagnostic laparoscopy. Furthermore, this patient-based screening tool empowers patients with endometriosis to self-identify potential symptoms and initiate dialogue with physicians about diagnosis and treatment, and hence contribute to shared decision making.