



## ISSN:

2542-2758 (Print) 2542-2804 (Online)

## ARTICLE INFO:

Received Date: 06/12/2023

Acceptance Date: 18/02/2024

Published Date: 16/04/2024

## KEYWORDS:

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## Access the article online

DOI: <https://doi.org/10.62065/bjhs551>

## CITATION:

Pradhan T. Navigating the Promise and Perils: Artificial Intelligence in Assisted Reproductive Techniques. *Birat J. Health Sci.* 2024;9(1):1-2.

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## Navigating the Promise and Perils: Artificial Intelligence in Assisted Reproductive Techniques

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## INTRODUCTION

The inclusion of artificial intelligence (AI) into assisted reproductive techniques (ART) represents a significant advancement in the field of reproductive medicine. AI shows the confidence of enhancing various aspects of ART, including treatment optimization, embryo selection, and predictive modeling. However, as with any emerging technology, the adoption of AI in ART necessitates careful consideration of ethical, legal, and social implications. This editorial aims to explore the dual role of AI in ART as a potential game-changer while emphasizing the need for caution and ethical blunder.

### Harnessing the Power of AI in ART:

AI-driven algorithms have demonstrated remarkable capabilities in analyzing complex datasets and optimizing treatment protocols in ART.<sup>1</sup> By implementation of machine learning techniques, clinicians can make use of predictive models to anticipate treatment outcomes and tailor interventions to individual patient profiles. Furthermore, AI-enabled image analysis facilitates the identification of high-quality embryos, thereby enhancing the success rates of in vitro fertilization (IVF) procedures. Combined images/time-lapse and clinical information inputs showed high median accuracy by the AI models 81.5% (range 67-98%), while clinical embryologists showed median accuracy of 51% (range 43-59%) on predicting embryo morphology and successful clinical pregnancy.<sup>2</sup> These advancements not only hold the promise of improving clinical outcomes but also have the potential to reduce treatment costs and alleviate the emotional burden associated with infertility.

### Cautionary Considerations and Ethical Implications:

Notably, AI is becoming a de facto standard for processing large amount of data to support complex decisions. Despite the potential benefits of AI in ART, several ethical considerations must be addressed to ensure responsible and equitable implementation. Firstly, there are concerns regarding patient privacy, data security, and informed consent in the context of AI-driven technologies because AI algorithms, specifically created through machine learning (ML), require large amounts of high-quality (personal) data to learn and give high quality results. Any leakage or misuse of data can result in massive damage to patients, healthcare providers and software vendors.<sup>3</sup> Additionally, the Black Box nature (i.e. process of interpretation of data is not shared) of AI algorithms raises concerns about bias, accountability, and the potential for unintended consequences.

### Data protection regulations:

Many countries have passed laws that aim to protect people's privacy. On May 25, 2018, European Union (EU) commission and European Economic Area (EEA) took in General Data Protection Regulation (GDPR) officially as data protection and privacy regulation. It also applies to personal data transfers outside of the EU and EEA.<sup>4,5,6</sup>

## CONCLUSION

The integration of artificial intelligence into assisted reproductive techniques represents a paradigm shift in the field of reproductive medicine. While AI holds the potential to revolutionize infertility treatment and improve patient outcomes, it is essential to proceed with caution and uphold ethical principles. By striking a balance between innovation and ethical considerations, we can harness the transformative potential of AI in ART while ensuring the well-being, autonomy, and dignity of individuals seeking fertility treatment.

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