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# Smart Choices: Artificial Intelligence in Embryo Selection

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In the recent 3 to 5 years, the field of reproductive medicine has witnessed significant and exciting progress in the integration of artificial intelligence (AI) and digital technologies, particularly in in vitro fertilization (IVF) (1). AI has been extensively explored across various aspects of infertility patient care, ranging from detecting follicles and forecasting embryo development to optimizing IVF protocols and implementing quality control measures (2).

The application of AI in embryo selection can mitigate the subjectivity inherent in the process by offering precise and dependable assessments of embryo development status, morphology, and even the potential to predict embryo viability (3, 4). Numerous efforts have been made to standardize the process of embryo selection through the application of AI, encompassing subfields like machine learning and deep learning. These efforts capitalize on visual data to create more objective methods for evaluating embryos. The emphasis has been on different technologies and outcome predictions, including anticipating blastocyst formation through morpho-kinetic annotations, predicting embryologist decisions regarding embryo transfer and cryopreservation, and forecasting implantation outcomes (5).

A parallel endeavor involves developing noninvasive methods for assessing embryos' genetic status. AI models tailored for this purpose analyze embryo images to comprehensively evaluate genetic status using phenotype or morphology as indicators of severe genetic damage. Some AI algorithms have shown promising predictive efficacy in classifying embryos based on their genetic status (6, 7).

Despite the progress made, there are ongoing challenges, especially in confirming the clinical effectiveness of AI models due to limited data. The obstacle of software generalization is significant, requiring consistent AI performance under various conditions, including differences in embryo culture methods, imaging tools, and patient demographics.

Prof. Zehra Kurdoğlu worked as an Assistant Professor between 2009 and 2012 and Associate Professor between 2012 and 2014 in the Department of Obstetrics and Gynecology, Faculty of Medicine, Van Yuzuncu Yil University. Between 2014 and 2018, she worked in the Department of Obstetrics and Gynecology of Ankara Training and Research Hospital. She was trained in robotic surgery at the Division of Minimally Invasive Gynecology and Research in the Department of Obstetrics and Gynecology of the University of Texas Medical Branch at Galveston, Texas, USA. She started to work at Yildirim Beyazıt University Faculty of Medicine, Department of Obstetrics and Gynecology in 2018. She received the title of Professor in 2021. Since 2019, she has been working in the field of Assisted Reproductive Medicine and IVF at Ankara Bilkent City Hospital, ART Center, Ankara, Turkey. At national and international levels, she has published over 100 scientific papers, written three book chapters, and received over 800 citations for her articles. She was previously a member of the editorial board of Van Medical Journal, Turkish Journal of Obstetrics and Gynecology, Turkiye Klinikleri Gynecology Obstetrics, and Eastern Journal of Medicine. Now, she is a member of the editorial board of the International Journal of Women's and Reproduction Sciences and the Crescent Journal of Medical and Biological Sciences.

## Conflict of Interests

None.

## Ethical Issues

Not applicable.

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