THE JOURNAL OF OBSTETRICS AND GYNECOLOGY OF INDIA

The Journal of Obstetrics and Gynecology of India (July–August 2018) 68(4):326–327
https://doi.org/10.1007/s13224-018-1118-4

SHORT COMMENTARY

Artificial Intelligence: The Future of Obstetrics and Gynecology

Gaurav Shyam Desai[1]

Received: 1 December 2017 / Accepted: 27 March 2018 / Published online: 10 April 2018

About the Author

Gaurav Shyam Desai is an Assistant Professor of Obstetrics and Gynecology at the Seth GS Medical College and King Edward Memorial Hospital in Mumbai, India. He has authored over 28 peer-reviewed publications in national and international journals, and more than 90 scientific presentations at various conferences in India and abroad. His interests include endoscopic techniques and pelvic cancer surgery.

Abstract

Background Artificial intelligence or 'big data' comprises of algorithms which aid in decision making. It has made an impact on a number of professions including obstetrics and gynecology.

Objective To make readers aware of where artificial intelligence has a role in obstetrics and gynecology.

Material and methods A comprehensive review of the literature was undertaken to compile a list of instances where artificial intelligence was applied to obstetrics and gynecology.

Conclusion Artificial intelligence should be utilized to benefit patient care and assist the physician in providing data for decision making.

Keywords Artificial intelligence · Obstetrics · Gynecology

Digitalization and research in the twenty-first century has led to the introduction of artificial intelligence. Artificial intelligence comprises of algorithms which aid in decision-making. But can this technology help in predicting clinical scenarios such as the onset of labor? Or for that matter how acceptable would egg selection using AI be?

Gaurav Shyam Desai MS, FCPS is an Assistant Professor of Obstetrics and Gynecology at the Seth GS Medical College and King Edward Memorial Hospital in Mumbai, India.

✉ Gaurav Shyam Desai
gdesai83@gmail.com

[1] Department of Obstetrics and Gynecology, Seth GS Medical College and King Edward Memorial Hospital, Mumbai, India

Can AI replace clinical experience or have the sixth sense that most clinicians feel in challenging cases? Maybe not. It will, however, aid in decision-making, and the profession will need to adapt and work around the capabilities of this system.

The effects of AI have already been felt in the areas of fetal heart monitoring and fertilization [1–3]. The development of artificial neural networks (ANN) has given an impetus for researchers who aim to prospectively predict outcomes. ANNs are mathematical systems which are reliable, flexible and evaluate multifactorial data at lightening speed. An example of AI utility is its application in assessing cardiotocographs during labor. Intrapartum monitoring is dogged by inconsistencies between different centers and between obstetricians. AI could make assessment more consistent and reduce perinatal and maternal morbidity. Potentially, an intelligence support software could reduce chances of litigation and the economic burden of healthcare particularly in developing countries.

Examples of where AI has been tested in CTG analysis include CAFE (Computer Aided Foetal Evaluator) and the INFANT study protocol, both highly integrated systems involving complex algorithms developed to overcome difficulties in CTG analysis [4, 5]. System 8000 is another such technology which was designed to take account of episodic changes in FHR and fetal movements characteristic of sleep states by recording CTG quality, uterine contraction peaks, basal heart rate, variation, decelerations, and accelerations [6].

A much needed boost for earlier detection of epithelial ovarian cancer (EOC) using noncoding RNAs has been attempted with a neural network model, and initial results suggest that circulating miRNAs have the potential to develop as a noninvasive diagnostic test for ovarian cancer [7]. Attempts have also been made to predict preterm labor by analyzing uterine electrical signals (electrohysterography), a specific type of electromyography [8, 9]. AI could also provide better and more consistent outcomes for IVF results between different clinics. But would it be moral in allowing an artificial computer-based algorithm to be a "wingman" to Darwin's much accepted theory on survival? These questions are the debates of the future.

The profession will need to accept that AI will play a role in determining outcomes. It will probably have the same effect on clinicians that digitalization has had. Complete dependence, however, on this technology will not be the answer. Will obstetricians and gynecologists resist this technology or let go of their ego and work with the new kid in the block? One thing is for sure, one can see a wave coming, it remains to be seen how we ride it.

Compliance with Ethical Standards

Conflict of interest The author declares that he has no conflict of interest.

Ethical Standards None.

References

1. Siristatidis C, Pouliakis A, Chrelias C, et al. Artificial intelligence in IVF: a need. Syst Biol Reprod Med. 2011;57(4):179–85.
2. Lutomski JE, Meaney S, Greene RA, et al. Expert systems for fetal assessment in labour. Cochrane Database Syst Rev. 2015;4:CD010708.
3. Jauniaux E, Prefumo F. Fetal heart monitoring in labour: from pinard to artificial intelligence. BJOG. 2016;123(6):870.
4. Guijarro-Berdiñas B, Alonso-Betanzos A. Empirical evaluation of a hybrid intelligent monitoring system using different measures of effectiveness. Artif Intell Med. 2002;24(1):71–96.
5. Brocklehurst P; INFANT Collaborative Group. A study of an intelligent system to support decision making in the management of labour using the cardiotocograph—the INFANT study protocol. BMC Pregnancy Childbirth. 2016;20(16):10.
6. Dawes GS, Moulden M, Redman CW. System 8000: computerized antenatal FHR analysis. J Perinat Med. 1991;19(1–2):47–51.
7. Elias KM, Fendler W, Stawiski K, et al. Diagnostic potential for a serum miRNA neural network for detection of ovarian cancer. Elife. 2017;6:1–28.
8. Idowu IO, Fergus P, Hussain A, et al. Artificial Intelligence for detecting preterm uterine activity in gynecology and obstetric care. In: 2015 IEEE international conference on computer and information technology.
9. Fergus P, Cheung P, Hussain A, et al. Prediction of preterm deliveries from EHG signals using machine learning. PLoS ONE. 2013;8(10):e77154.