

FOETAL HEART RATE VARIABILITY

The availability of standardized guidelines regarding the use of electronic foetal monitoring (EFM) in clinical practice has not effectively helped to solve the main drawbacks of foetal heart rate (FHR) surveillance methodology, which still presents inter- and intra-observer variability as well as uncertainty in the classification of unreassuring or risky FHR recordings. Mainly, the first clinical expectation of reducing consequences due to serious hypoxia, such as cerebral palsy, have been disappointed. Given the clinical relevance of the interpretation of FHR traces as well as the role of FHR as a marker of foetal wellbeing autonomous nervous system development, many different approaches for computerized processing and analysis of FHR patterns have been proposed in the literature. The objective of this speech is to review and discuss the main methodologies, and algorithms proposed in this field so far, reporting their key achievements and examining the value they brought to the scientific and clinical community.

After a summary concerning the cardiotocography, the most widespread recording technique of foetal heart rate and uterine contractions, and other possible techniques, the following two main approaches to the processing and analysis of FHR signals will be examined: traditional (or linear) methodologies, namely, time and frequency domain analysis, and less conventional (or nonlinear) techniques. In this scenario, the emerging role and the opportunities offered by Artificial Intelligence tools, representing the future direction of EFM, will be also briefly discussed.

Finally, lack of an established and shared methodology for computing the FHR variability will be discussed and some results shown and described.