

Guest editorial

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Introduction to fetal electrocardiography

The fetal electrocardiogram (FECG) has been recordable for 80 years. For the clinical use of it two aspects are relevant: heart rate and the PQRS waveform. So far the main interest has been in fetal heart rate recording. Recently, however, disenchantment has been growing with the ability of cardiotocographic (CTG) tracings to predict fetal condition, whether they are obtained via scalp electrode or ultrasonically in labor [7]. Misgivings have also been expressed about the safety aspects of the use of ultrasound to monitor a fetus.

Early interest in the FECG waveform [4] was hampered by major technical difficulties with signal isolation and analysis. Recent advances in microprocessor techniques have allowed for the accurate and reproducible isolation, and virtual instantaneous analysis of the fetal ECG waveform. A new form of fetal analysis has therefore presented itself, which, although being potentially full of promise with regard to assessment of fetal condition [1, 5, 6], has yet to be fully assessed.

The need for a concerted action in the field of FECG was formulated during a meeting of the European Community Project 'Perinatal Monitoring' in Copenhagen in 1984 [3]. In the same year during a workshop of the 'Perinatal Monitoring' project in Heidelberg, several aspects of FECG research were discussed [2]. Among these were the presentations of promising results in the suppression of the maternal component in the FECG using singular value decomposition and on the clinical significance of the abdominally recorded FECG.

This issue of the Journal of Perinatal Medicine is devoted to the papers presented by obstetricians, physiologists, physicists and engineers at the International Workshop on Fetal Electrocardiography held in Nottingham on 25–27 November 1985 (co-ordinator: H. MURRAY).

This workshop was held within the framework of the European Community Project 'Perinatal Monitoring'. The issue starts with review articles that mainly discuss the significance of the several waveform components of the FECG in animal experiments as well as in human antepartum and intrapartum studies. The other articles present ongoing research in the field of FECG. The papers from the organizers and hosts in Nottingham (KIRK et al. and MURRAY) deal with the correlations between fetal condition during labor and changes in the waveform components of the FECG. The paper of CARTER discusses the quality of fetal heart rate determination using either R wave recording or Doppler ultrasound. New digital signal techniques for the processing of the abdominally recorded FECG are used in the papers by VAN OOSTEROM and CALLAERTS et al. Insight into the propagation of the electrical signal from the fetal heart to the maternal abdomen as obtained by the processing of multilead recordings is presented by OOSTENDORP et al. The last paper (CERUTTI et al.) deals with the variability of the fetal heart rate using the abdominal FECG and advanced spectral analysis techniques.

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