Gynecology and Reproductive Endocrinology

Differential Diagnosis of Monotonous Fetal Heart Rate

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Abstract

The aim was to explore the possibility to forecast a risk of hypoxic lesions in monotonous fetal heart rate via ECG measurements by the methods of time and frequency analysis. The study involved 50 healthy pregnant women with singleton pregnancy at 37-41 weeks of gestation along with 17 pregnant women in the same period of gestation who had a monotonous fetal heart rate registered of various origin: physiological, pharmacological and hypoxic. The registration of fetal heart rates were performed using fetal monitor "Monica AN24" ("Monica Healthcare LTD", UK) transabdominal, using ECG electrodes. The software package "Monica DK" has been used to retrieve the "beat to beat" data. Analysis of experimental data carried out on the basis of LABVIEW® software (national Instruments, USA®). We assessed the basic functions of HRV: the spread and concentration functions, vegetative balance. Vegetative balance was tested with indicators of spectral analysis using fast Fourier transform algorithm. At the same time, a morphological analysis of the fetal ECG was conducted. The analysis of time parameters for fetal hypoxia showed a sharp decline in the spread function and a sharp increase in the concentration function. Spectral analysis showed a significant decrease in the ratio of high to low frequency components of the spectrum. In the analysis of fetal ECG the ST segment depression was noted, which is also indicative of fetal hypoxia. Conclusions: "beat to beat" data are a prerequisite for a correct interpretation of cardiorhytmogram of fetus. The complex wave structure of cardiorhytmogram involves methods of time and frequency HRV analysis to decipher vague CTG,s. The diagnostic scale of time and frequency parameters of HRV allows to determine fetal risk of hypoxic lesions in vague CTG.

Publications

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