Fetal Non-invasive Electrocardiography Contributes to Better Diagnostics of Fetal Distress: A Cross-sectional Study Among Patients with Pre-eclampsia

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Abstract

Introduction: Fetal distress is a result of acute or chronic disturbances in the system of “mother-placenta-fetus” in pre-eclampsia (PE). The aim of the investigation was to compare the accuracy of antenatal fetal distress diagnostics in cases of traditional cardiotocography (CTG) waveform evaluation and analysis of morphological non-invasive electrocardiogram (ECG) parameters in antepartum patients with PE. Materials and Methods: Fetal non-invasive ECG antenatal recordings of 122 pregnant patients at 34 to 40 weeks of gestation were examined. In Group I, there were 32 women with physiological gestation and normal fetal condition according to haemodynamic Doppler values. Group II involved 48 patients with mild and moderate PE whom were performed Doppler investigation. In Group III, 42 patients with severe PE were monitored with haemodynamic Doppler. Results: Fetal autonomic tone was lower with the relative increase of low frequency (LF) branch in the patients of pre-eclamptic group. The increased value of the amplitude of mode (AMo) and stress index (SI) was associated with adrenergic overactivity. It has induced pQ and QT shortening, increased T/QRS ratio and decelerations appearance. The rate of antenatal fetal distress retrospectively was 31.1% in PE. The traditional analysis of CTG parameters has showed sensitivity (72.7%) and specificity (87.1%). In addition to the conventional CTG analysis, evaluation of ECG parameters has contributed to better diagnostics of fetal distress. Sensitivity and specificity of non-invasive fetal ECG were absolutely equal in this study (100%). Conclusion: The results suggest that fetal non-invasive ECG monitoring is more objective than conventional CTG.

Ann Acad Med Singapore 2015;44:519-23

Key words: Fetal heart rate variability, Fetal monitoring, Hypertensive disorders of pregnancy