

Cardiac Electrical Alternans in Pregnancy: An Observational Study

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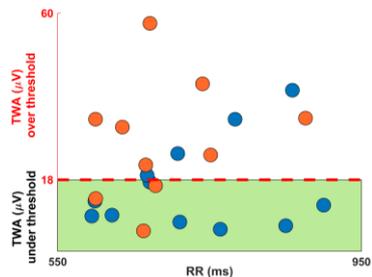
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In pregnancy, if the woman has a cardiovascular disease, her fetus has an increased risk of inherited cardiac genetic disorders. Fetal arrhythmias are common and debates are still open on their etiology. Aim of this study was to evaluate cardiac electrical alternans of 22 pregnant women, comparing 12 mothers of fetuses with normal rhythm (MUM_nrF, gestational age: 23±5weeks) and 10 mothers of arrhythmic fetuses (MUM_arrF, gestational age: 34±6weeks). Evaluation of electrocardiographic alternans (ECGA, μV) on 30-s electrocardiograms (ECG), was performed. ECGA is a noninvasive cardiac electrical risk marker able to reveal heart electrical instability. At stable heart rate, ECGA reflects beat-to-beat morphology fluctuation of ECG P wave (P-wave alternans, PWA), QRS complex (QRS alternans, QRSA) and T wave (T-wave alternans, TWA). Analysis was performed by application of the enhanced adaptive matched filter method. PWA, QRSA and TWA distributions on both MUM_nrF and MUM_arrF populations were expressed as 50th [25th;75th] percentiles and comparisons were performed by the Wilcoxon rank-sum test, with statistically significant level (p) set at 0.05. Although showing similar heart rate (MUM_nrF: 85 [74;93]bpm; MUM_arrF: 90 [81;94]bpm), ECGA was higher in MUM_arrF population than MUM_nrF one, but distributions were statistically different only when considering TWA (Table). Moreover, in 70% of MUM_arrF,

ECGA (*: p < 0.05)

ECGA	MUM_nrF	MUM_arrF
PWA	9 [7;14] μV	14 [9;24] μV
QRSA	9 [7;17] μV	17 [9;25] μV
TWA	12 [8;22] μV	28* [17;34] μV

TWA showed to be higher than a previously analyzed female healthy population (on average 18 μV), vs. 33% of MUM_nrF (Figure). Thus, in this preliminary observational study, higher TWA in MUM_arrF seems to reflect a more unstable heart electrical condition of arrhythmic fetuses' mothers than normal-rhythm fetuses' mothers. Further studies are needed to possibly validate our results.



TWA for MUM_nrF (blue markers) and MUM_arrF (orange markers).