# Intrauterine Growth Restriction Induced ECG Morphological Differences Measured in Adulthood

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**Aims:** Numerous studies associate intrauterine growth restriction (IUGR) and premature birth with higher risk for cardiovascular diseases throughout adulthood. This study aims to analyse and correlate the well known heart morphology changes with changes at the surface ECG and observe if the results corroborate those correspondences found in previous studies of pre-adolescents who were born with low birthweight.

**Methods:** 87 adults conformed the study population. There were 2 subgroups to study: term birth with adequate weight for gestational age (control group, 33 subjects), and those who had IUGR at birth (54 subjects). Once QRS and T-wave loops were obtained from the averaged vectorcardiogram, the angle between the depolarization and repolarization dominant vectors in the three-dimensional space and the absolute and relative angles between the dominant vectors and the three orthogonal planes were studied.

**Results:** The angle between the dominant vectors of the QRS loop and the T-wave loop in the XY-plane (i.e. the frontal plane) showed statistically significant larger values for controls ($13.49 \pm 13.65$) than for adults who were born with IUGR ($9.26 \pm 8.47$).

**Conclusion:** The present study shows that a significant narrowing of about $4^o$ occurs to the angle between the QRS loop and the T-wave loop in the frontal plane when the adult had IUGR. This narrowing can be hypothesised to be a biomarker for IUGR cardiovascular risk. The results are in accordance with those obtained for pre-adolescent subjects who were preterm, further supporting the findings.