Complex Rhythm Patterns Associated with Fetal Atrial Flutter

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Background: Atrial flutter (AFI) accounts up to a third of all fetal tachyarrhythmias and is believed to present later than 30 weeks gestation. Hydrops fetalis and a high mortality rate have been described. The aim of this study was to investigate the electrophysiologic characteristics of fetal AFI by fetal magnetocardiography (fMCG) from 20 weeks gestation onwards in order to define patterns that might predict sustainability.

Methods: All fetuses were referred due to a suspected diagnosis of AFI by echocardiography, which included an atrial rate > 300/min and variable AV conduction. Electrophysiologic fMCG rhythm and conduction patterns such as RR interval, cardiac time intervals, AV conduction pattern were defined for presenting and associated rhythms. The fMCG recordings were made using a 37-channel superconducting quantum interference device magnetometer.

Results: 15 fetuses were included in the study with a median gestational age of 30 (Range 20 to 38) weeks gestation. AFI was diagnosed in 13 fetuses (incessant AFI (n= 3); intermittent AFI (n=10); Sinus rhythm was found exclusively in two fetuses. Additional rhythm patterns showed SVT (n=6), WPW pattern (n=3) and both (n=1), blocked atrial bigeminy/trigeminy (n=7), atrial fib/flutter (n=2), atrial couplets (n=1), bundle branch block (n=1) and saw tooth P wave pattern (n=3).

Conclusion: Fetal AFI includes variable and complex rhythm patterns and can present earlier than 30 weeks gestation, indeed as early as 20 weeks gestation. As these rhythm disturbances can lead to severe complications in pregnancy, fetal electrophysiologic assessment may help better define antiarrhythmic therapy and perinatal management strategies.