

# Fetal sympathetic nervous activity during the second trimester of pregnancy

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### Fetal sympathetic nervous activity during the second trimester of pregnancy

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**Introduction:** Valuable information for assessing fetal wellbeing might be obtained from spectral analysis of fetal heart rate variability. In literature, spectral analysis of fetal heart rate has been reported only for pregnancies >20 weeks of gestation. The development of a non-invasive fetal ECG device has enabled the recording of the beat-to-beat fetal heart rate in pregnancies of 18 weeks of gestational age (GA) and higher. To investigate fetal sympathetic nervous activity in the second trimester of pregnancy, the beat-to-beat fetal heart rate was recorded in pregnancies of 18-27 weeks of gestation.

**Methods:** Measurements were performed in 50 healthy pregnancies using a prototype non-invasive fetal ECG device (NEMO). From these recordings R-R interval series were obtained and analyzed using Wavelet packets. Spectral powers were calculated in the very low frequency (VLF) band (<0.04 Hz), the low frequency (LF) band (0.04-0.15 Hz), and the high frequency (HF) band (0.4-1.5 Hz). In addition, normalized low (LFn) and high (HFn) frequency powers were calculated, as these may reflect autonomic nervous activity more objectively.

**Results:** In the period before 20 weeks of gestation, LFn is found to be significantly lower than in the period after 20 weeks of gestation (<20 weeks GA: LFn =0.39±0.20, >20 weeks GA: LFn =0.74±0.15, p<0.001).

**Discussion and Conclusion:** The significantly lower normalized LF power for gestational ages <20 weeks might indicate that functional development of the fetal sympathetic nervous system does not take place earlier than 20 weeks of gestation.

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