

Exercise During Pregnancy Leads To A Healthier Heart In Moms- And Babies-to-be

ScienceDaily (Apr. 10, 2008)— Studies have shown that exercise has a positive effect on mothers-to-be, and no detrimental impact on their developing offspring. A new study further extends the knowledge of research in this area and has found that not only do women benefit from exercise in pregnancy, but their fetuses do too.

The Study

The researchers hypothesized that maternal exercise during pregnancy can have a beneficial effect on fetal cardiac programming by reducing fetal heart rate and increasing heart rate variability. As a result, a key component of the research involved magnetocardiography (MCG), the magnetic correlate of an electrocardiogram (ECG). MCG is a safe, non-invasive method to record the magnetic field surrounding the electrical currents generated by the fetal heart and nervous system. In addition to measures of heart rate and variability, the MCG allows for the study of the cardiac waveforms to measure of cardiac time intervals.

For the study, fetal recordings were obtained from 24 weeks to term. Maternal and fetal events were recorded in real time. Fetal movements such as breathing, body and mouth movements were recorded using the MCG in order to determine fetal state and to track heart rate accelerations. The recordings were done at four-week intervals. The data were derived from fetal MCG conducted in the second and third trimesters of pregnancy and in the postnatal period. The data captured was used to measure fetal heart rate (HR) as derived from the fetal MCG recordings.

Ten women participated in the study. Each was classified as either an exerciser (n=5) or control (n=5). The women were grouped according to the frequency, intensity, and length of physical activity they engaged in (i.e., moderate-to-heavy intensity aerobic activity for 30 minutes per session three times per week or the metabolic equivalent).

Findings

1. there were significantly lower heart rates among fetuses that had been exposed to maternal exercise. The heart rates among non-exposed fetuses were higher, regardless of the fetal activity or the gestational age.
2. at each stage of gestation the differences between the fetal heart rates of the two groups were statistically significant ($p < 0.05$ using a t-test with equal variances).
3. the analysis of short- and long-term heart variability at 28, 32 and 36 weeks of gestation in exercise-exposed vs. non-exercise-exposed fetuses were statistically different at 32 wks. This trend is still seen at 36 wks, however it is not significant.

These findings are contained in a new study entitled, *Effects of Maternal Exercise on the Fetal Heart*. It was conducted by Linda E. May of the Department of Anatomy, Kansas City University of Medicine and Biosciences (KCUMB), Kansas City, MO; Kathleen F. Gustafson, Anda Popescu and Mihai Popescu of the Hoglund Brain Imaging Center, KUMC, Kansas City, KS; and William B. Drake, Department of Pediatric Cardiology, Children's Mercy Hospital/UMKC School of Medicine, Kansas City, MO. Dr. May will present her team's findings at the 121st annual meeting of the American Physiological Society, part of the Experimental Biology 2008 scientific conference. Research support was provided by HBIC pilot Funds and KCUMB intramural grants.

Conclusions

According to Dr. May, "This study suggests that a mother who exercises may not only be imparting health benefits to her own heart, but to her developing baby's heart as well. As a result of this pilot study, we plan to continue the study to include more pregnant women."

<http://www.sciencedaily.com/releases/2008/04/080407114630.htm>