Exercise in pregnancy reduces size of offspring

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According to a new study accepted for publication in The Endocrine Society's *Journal of Clinical Endocrinology & Metabolism* (*JCEM*), regular moderate-intensity aerobic exercise led to a modest reduction in offspring birth weight without restricting the development of maternal insulin resistance.

There is a large body of evidence demonstrating the influence of the in utero environment on growth trajectory in postnatal life. Increased size at birth is associated with greater risk for the development of obesity in childhood. This study is the first to demonstrate a significant effect of non-weight bearing exercise (such as stationary cycling) on birth weight.

"Our findings show that regular aerobic exercise alters the maternal environment in some way that has an impact on nutrient stimulation of fetal growth, resulting in a reduction in offspring birth weight," said Paul Hofman, MD, of the University of Auckland in New Zealand and co-author of the study. "Given that large birth size is associated with an increased risk of obesity, a modest reduction in birth weight may have long-term health benefits for offspring by lowering this risk in later life."

This study is also the first to evaluate changes in insulin sensitivity in response to aerobic exercise training during pregnancy. Maternal insulin resistance is essential in increasing nutrient availability to the fetus and has been correlated with birth size. Exercise has been shown to reduce insulin resistance but a major reduction in insulin resistance may adversely affect a pregnancy by severely restricting fetal nutrition.

However, findings from this study suggest that regular exercise during pregnancy does not cause the same reduction in insulin resistance that occurs in exercising non-pregnant individuals.

"The physiological response to pregnancy appears to supersede the chronic improvements in insulin sensitivity previously described in response to exercise training in non-pregnant individuals," said Hofman. "This may be an important finding for athletes who want to continue regular training during their pregnancy as it suggests that training will not have a major adverse impact on insulin resistance."

In this randomized trial, researchers assigned 84 first-time mothers to either exercise or control groups. Participants in the exercise group utilized stationary cycling and were individually prescribed to a maximum of five sessions of 40 minutes of aerobic exercise per week. The exercise group was instructed to maintain the exercise program until at least 36 weeks gestation. Insulin sensitivity was assessed at 19 and 34-36 weeks gestation using an intravenous glucose tolerance test. Birth weight and BMI at birth were measured within 48 hours of birth.

Exercise training had no effect on maternal body weight or BMI during late pregnancy. Furthermore, exercise had no effect on insulin resistance from baseline to late gestation, and did not affect any other parameters of glucose regulation. Offspring of exercisers were on average 143 ± 94 grams lighter than their control counterparts, however there was no difference in birth length. Exercise training also resulted in lower offspring BMI.

More information: The article, "Exercise Training in Pregnancy Reduces Offspring Size without Changes in Maternal Insulin Sensitivity," will appear in the May 2010 issue of JCEM.

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