

## Physical Activity is Associated with Reduced Fasting Insulin in Pregnancy

Gestational diabetes mellitus (GDM), one of the most common complications of pregnancy, is on the rise in the United States. Physical activity among overweight or obese pregnant women may reduce their risk for developing GDM, according to a pilot study supported by a seed grant from the Center for Research in Nutrition and Health Disparities.

These findings, published in the October 2010 issue of "The Journal of Maternal-Fetal and Neonatal Medicine," may prove valuable in developing behavioral interventions to help prevent pregnancy complications and consequences for mothers and their offspring.

Dr. Jihong Liu, an Arnold School epidemiologist and the study's principal investigator, "GDM is a significant public health and clinical problem because women with GDM have an increase in risk of type 2 diabetes after pregnancy. On top of that, the diabetic or obese intrauterine environment will also have health consequences on the next generation."

During 2006-2007, 69 overweight or obese pregnant women were enrolled in the Pregnancy and Active Living Study (PALS). Participants were recruited from a regional obstetrics and gynecology clinic that primarily serves low-income and predominately African-American pregnant women.

African-American women are at a high risk for developing GDM, Liu said, because many are overweight before pregnancy, and gain excess weight during pregnancy. Also, this population is at risk for being sedentary and having poorer birth outcomes compared to Caucasian women.

The primary purpose of the pilot study was to examine the health effects of physical activity during pregnancy on a mother's (such as preventing GDM and facilitating healthy weight gain during pregnancy) and her baby's health. The pilot study also helped Liu determine the feasibility of recruiting study participants from a population that is traditionally at high risk for GDM and excessive weight gain during pregnancy.

Researchers obtained blood samples from the expectant participants to examine levels of fasting plasma insulin, a measure of insulin resistance, which is one of the key metabolic factors in the development of GDM. Study participants also provided responses about their previous physical activity levels, which included the amount of time spent participating in household/caregiving, occupational, transportation, and sedentary activities, as well as exercise. Participants were followed at 24-28 weeks of pregnancy, at delivery, and twice after delivery until four months postpartum. Results indicated that fasting insulin values progressively decreased with increasing levels of physical activity.

This research documented an association between favorable physiological changes in fasting insulin and physical activity during pregnancy and provides support for the findings from previous studies that show physical activity during pregnancy can reduce the risk of GDM.

### Key Points

- Gestational diabetes mellitus (GDM) is on the rise in the US, which can lead to life long health consequences for the mother and baby.
- Results of this study indicated that fasting insulin values, a measure of insulin resistance, progressively decreased with increasing levels of physical activity during pregnancy.
- Information gained from this study helped Arnold School researchers design community interventions to address risk factors to prevent GDM.

Currently, Liu and Arnold School researcher Dr. Sara Wilcox are designing a lifestyle intervention for overweight or obese pregnant African-American women to help them gain healthy weight during their pregnancy and promote weight loss postpartum.

“This seed grant was important because it provided the data for a research project that was recently funded by NIH,” said Liu.

Liu and Wilcox have also submitted a grant to the NIH that aims to collaborate with a community organization to test the feasibility and acceptability of a translational lifestyle intervention to prevent type II diabetes in women with a recent GDM diagnosis.