

## **Pregnancy Weight Gain in Obese Mothers and Bronchodilator Use in Their Children**

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### Abstract

Obesity is associated with increased systemic inflammation including TNF- $\alpha$ , changes in immune response, and increased rates of pulmonary illness. Obesity during pregnancy increases the risk for gestational diabetes, Cesarean section and birth complications. Thus the developing fetus is at risk for developing heightened airway reactivity or altered lung development as a result of the maternal obesity associations.

To our knowledge, the possible influence of acute weight gain during pregnancy in obese women on respiratory illness in early childhood has not been investigated. However, a recent study demonstrated the risk of wheezing (diagnosed through 18 months of age) increased linearly with maternal BMI collected at 13-17 weeks of gestation (1).

We hypothesize that acute weight gain during pregnancy in obese women (in addition to pre-pregnancy BMI) will adversely affect infant respiratory health as related by observations and treatment of wheezing.

Drs. Victor Stevens and Kim Vesco, our collaborators at Kaiser Permanente Health Plan, have preliminary data on 17,196 singleton pregnancies that began between January 2000 and December 2004. 3,110 of these women had pre-pregnancy weights consistent with obesity (BMI  $\geq$  30). Neonates born to these obese women who gained > 15 pounds were significantly more likely to be macrosomic (23% vs 15%) compared to babies born to women who gained 0-15 pounds vs 11% (babies born to women who lost weight). We propose to further analyze the respiratory outcomes (by electronic medical record) of these children categorized by the velocity of the mother's weight gain during pregnancy. We will use the prescription of bronchodilators, inhaled or systemic steroids, as well as the incidence of hospital admissions or emergency room visits for respiratory diagnoses, through 3 years of age as markers of respiratory disease. Drs. Victor Stevens and Kim Vesco will be the KPNW principle investigator and co-investigator, and Drs. Cindy McEvoy and Kelvin MacDonald will be the OHSU principle investigator and co-investigator for the study.

The data obtained from this proposal will serve as foundation for applications to the National Institutes of Health to develop models to study the mechanisms of these relationships *in vitro* and *in vivo*.

1.Haberg SE, Stigum H, London SJ, Nystad W, Nafstad P. Maternal obesity in pregnancy and respiratory health in early childhood. Paediatric and Perinatal Epidemiology 2009; 23, 352-362.