Weight gain in pregnancy linked to overweight in kids

April 2 2007

Pregnant women who gain excessive or even appropriate weight, according to current guidelines, are four times more likely than women who gain inadequate weight to have a baby who becomes overweight in early childhood. These findings are from a new study at the Department of Ambulatory Care and Prevention of Harvard Medical School and Harvard Pilgrim Health Care and are published in the April issue of the *American Journal of Obstetrics and Gynecology*.

"Maternal weight gain during pregnancy is an important determinant of birth outcomes," says lead author Emily Oken, MD, MPH, instructor in the Department of Ambulatory Care and Prevention. "These findings suggest that pregnancy weight gain can influence child health even after birth and may cause the obstetric community to rethink current guidelines."

Oken and colleagues examined data from 1,044 mother-child pairs in Project Viva, a prospective study of pregnant women and their children based at the Department of Ambulatory Care and Prevention's Obesity Prevention Program. The authors studied whether pregnancy weight gain within or above the recommended range increased the risk of a child being overweight at age 3 years.

In 1990, the Institute of Medicine (IOM) published guidelines for gestational weight gain ("Nutrition During Pregnancy") that were motivated by evidence that low weight gain in pregnant women may cause low birth weight. These guidelines call for smaller gains in

mothers with a higher body mass index (BMI) and generally permit greater gains than previous recommendations.

The IOM report remains the standard for clinical recommendations regarding gestational weight gain. However, some have questioned whether evidence is sufficient that greater gains promote better birth outcomes in modern developed nations. More weight gain may cause undesirable birth outcomes, such as increased rates of babies born at high birth weight and cesarean section, and is associated with higher postpartum weight retention and later risk of maternal obesity.

In this study, 51 percent of women gained excessive weight, 35 percent gained adequate weight, and 14 percent gained inadequate weight, according to the IOM guidelines. Women with adequate or excessive gain were approximately four times more likely than those with inadequate gain to have an overweight child, as measured at age 3. The authors defined overweight as a BMI greater than the 95th percentile for the child's age and sex.

"Our study shows that excessive weight gain during pregnancy was directly associated with having an overweight child," says Oken. "Just like adults, children who are overweight are at higher risk for a number of health conditions such as high blood pressure, diabetes, and high cholesterol."

The likelihood of having a baby that was heavy for gestational age was greater in women with excessive gain. Children of mothers who gained more weight also had somewhat higher systolic blood pressure, a cardiovascular risk factor related to weight even in young children.

The authors calculated total gestational weight gain as the difference between the last weight recorded before delivery and self-reported prepregnancy weight. The authors categorized women as having gained

inadequate, adequate, or excessive weight according to the IOM guidelines. These guidelines recommend that women with a prepregnancy BMI between 19.8 and 26 kg/m2, (considered normal by the IOM guidelines) should gain 11.5 to 16kg (25 to 35 pounds); that women with a BMI of less than 19.8 kg/m2 (considered underweight by the IOM guidelines) should gain 7 to 11.5 kg (15 to 25 pounds); and that women with a BMI of more than 29 kg/m2 (considered obese by the IOM guidelines) should gain at least 6 kg (13 pounds).

Gestational weight gain may be linked to child overweight through several potential pathways. Mothers who gain weight readily because of genetic, dietary, or other behavioral factors may have children who are more likely to gain weight. Also, the amount of weight gained during pregnancy may alter the intrauterine environment, not only influencing fetal growth but also possibly resulting in persistent programming of child weight.

"Because childhood obesity is increasing in prevalence and effective treatment remains elusive, preventing childhood obesity remains critical," says Oken. "The IOM may need to reevaluate its recommendations for gestational weight gain, considering not only birth outcomes but also risk of obesity for both mother and child. While our study signals the potential need to adjust guidelines, further studies will need to occur to determine just what the appropriate weights should be."

Like the United States population as whole, many mothers and their children in this study were overweight. Even mothers with adequate gain according to the IOM guidelines had a substantially higher risk than mothers with inadequate weight gain of having overweight children, with no difference in risk of undesirable birth outcomes, such as small or large size for gestational age or birth by cesarean section.

"It has been 17 years since the IOM came out with its last set of

recommendations, before the obesity epidemic hit with full force," says Matthew Gillman, MD, associate professor in the Department of Ambulatory Care and Prevention and senior author of the study. "Now, women are coming into pregnancy at higher weights and likely gaining excessively more than they used to. We need to find out how to counter this trend--but not go too far back in the other direction when women were gaining too little weight."

Source: Harvard Medical School