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EMBARGOED FOR RELEASE  
Monday, December 5, 2005  
12:15 a.m. ET

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## Obesity Before Pregnancy Linked to Childhood Weight Problems

A new study shows that a child's weight may be influenced by the mother even before the child is actually born. The study, conducted by researchers from Ohio State University (OSU) College of Nursing and School of Public Health, appears in the December 5, 2005 issue of the journal *Pediatrics* and was supported by the National Institute of Nursing Research (NINR), one of the National Institutes of Health (NIH).

The study showed that a child is more likely to be overweight at a very young age — at 2 or 3 years old — if the mother was overweight or obese before she became pregnant. The data also indicate that other prenatal characteristics, particularly race, ethnicity, and maternal smoking during pregnancy, place a child at greater risk of becoming overweight. Specifically, a child is at greater risk of becoming overweight if born to a black or Hispanic mother, or to a mother who smoked during her pregnancy, according to the study.

Pamela Salsberry, Ph.D., the study's lead author and an associate professor at OSU, noted that "there's a good chance that an overweight child will stay overweight for the rest of his or her life." "A child who is overweight by her second birthday is more likely to be overweight at a later age," said Dr. Salsberry. "Prevention of childhood obesity needs to begin before a woman becomes pregnant," she added.

"Dr. Salsberry's work underscores the importance of prenatal care and how the health habits of the mother prior to and during pregnancy may impact the health of her child through the early years of childhood and possibly through adulthood," said NINR Director Dr. Patricia A. Grady. "Understanding how these factors may contribute to obesity very early in life will better equip us to fight the increasing problem of obesity in America and help to prevent diseases associated with obesity, such as type 2 diabetes, heart disease, and some forms of cancer" Dr. Grady added.

The researchers analyzed the data for 3,022 children included in the National Longitudinal Survey of Youth's (NLSY) Child-Mother file. In this study, children were weighed at three age intervals — 3, 5 and 7 years. The survey also gathered information on each child's race and ethnicity as well as the mother's pre-pregnancy weight. Each mother was also asked if she had smoked while pregnant and if she had breast-fed her child.

Children were considered overweight if their body mass index (BMI) was greater than or equal to the 95th percentile for their age and gender. BMI is a calculation that takes into account both height and weight. A child in the 95th percentile for his or her weight is heavier than 95 percent of children at that age.

The study showed a significant relationship between a mother's weight prior to pregnancy and her child's weight. A mother's weight within one to two months before she became pregnant had the greatest impact on a child's weight at all three age intervals.

If a woman was overweight before she became pregnant, her child was nearly three times more likely to be overweight by age 7 compared to a child whose mother was not overweight or obese, according to the study. The risk that a child would be overweight at a young age increased with the degree of the mother's obesity.

The investigators reported that at each age interval, about 4 to 6 percent more black and Hispanic children were overweight than white children. However, the percentage of all children who were overweight, regardless of race or ethnicity, decreased with age. "Some children lose extra body weight and become leaner as they grow," Salsberry said.

Children of mothers who smoked during pregnancy were more likely to be heavy at all three age intervals. "Obviously smoking during pregnancy causes a host of serious problems, but this finding adds to the growing body of evidence that suggests that smoking during pregnancy may be a key risk factor that increases a child's chances of being overweight," Salsberry said.

Breast feeding had a slight effect on weight at each measurement: As much as 5 percent fewer children who were breast-fed were also overweight, compared to bottle-fed babies.

The researchers also looked at other factors that may affect a child's weight, such as the age of the mother when she gave birth, the child's gender and whether or not the mother was married. None of these factors had the same degree of effect on childhood weight as a mother's weight prior to pregnancy, race, ethnicity or smoking.

Two out of three children who were overweight at their final weighing were also overweight during at least one prior weighing. Three out of four children who were at a normal weight at the final weighing had always been at a normal weight.

"A child's weight at 3 years is a good prediction of what his weight will be at age 5, and so on," Salsberry said. "Weight states tend to persist over time. "Obesity continues to rise in adults," she said. "And that risk has increased in children, too. Interventions should begin immediately for children who are already overweight at these young ages."

Dr. Salsberry conducted the study in conjunction with Patricia Reagan, Ph.D., a professor of economics at OSU.

*NINR is a component of the National Institutes of Health, an agency of the U.S. Department of Health and Human Services. NINR supports clinical and basic research to establish a scientific basis for the care of individuals across the life span — from management of patients during illness and recovery to the reduction of risks for disease and disability, the promotion of healthy lifestyles, promoting quality of life in those with chronic illness, and care for individuals at the end of life. For more information about NINR and its program, visit <http://ninr.nih.gov/ninr>.*

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