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Obesity can be predicted from infancy, researchers find

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Infants as young as two months old already exhibit growth patterns that can predict the child's weight by age 5, according to researchers at Case Western Reserve University's Frances Payne Bolton School of Nursing and Tennessee State University.

"Almost from birth, we quickly saw this growth pattern emerge in our curves and growth charts for weight over height," said Susan Ludington, the study's lead investigator and the Carl W. and Margaret David Walter Professor of Pediatric Nursing at Case Western Reserve.

Analyzing well-child records, normal-weight babies with a body-mass index (BMI) in the 17 percentile were found to have plateaued at about two months and rarely deviated over the next five years, she said. Overweight or obese babies crossed the 17 percentile many months later (about age 14 months) and continued an upward climb when BMI growth patterns were monitored.

The findings were reported in *Clinical Pediatrics*. Ludington collaborated with Lisaann Gittner, assistant professor of public service at Tennessee State University, and Harold Haller, director of Case Western Reserve's Center for Statistical Consulting.

The researchers found that, by age 5, normal-weight children developed differently from birth than those considered overweight, obese or severely obese.

For this study, 221 children were selected from 4,000 records of healthy children under the care of a health maintenance organization. Each had weight, height and medical records from nine well check-ups over the first five years of their lives.

None had a hospital or emergency room visit, medical procedure or other special medical condition, or were on medications that might skew results. No other study of early weight changes has used a sample of only healthy infants and children.

"We didn't want anything to interfere with regular eating," Ludington said.

She said the study also differed from others because researchers had access to maternal health records, with information about the mothers' pre-pregnancy weights and whether they smoked—a factor that could influence the baby's weight.

The researchers suspect, based on prior research findings by others, how a mother ate during pregnancy might have contributed to a baby's hormones and the ability to satisfy a baby's hunger.

Tracking obesity to the first months of life came after Haller took a new statistical approach to infant growth. He plotted on a graph a baby's weight divided by height instead of using BMI scores as a guideline. By graphing, a pattern emerged that found both girls and boys known to be obese at 5 begin to show significantly higher weight over height than normal weight babies as early as 2-4 months of age.

Because such patterns emerge before children generally start eating solid food, early life growth patterns may provide important information about a person's future health issues, Ludington said.

The researchers also questioned using the BMI index as a guide to growth, which is based on European babies primarily breast-fed in the first year. In the United States, many babies have only formula feedings.

These findings could potentially change the age at which obesity is typically diagnosed, which is now at or after age two.

Ludington said the next step is to find a good intervention that takes into consideration whether a baby is fed on demand or a schedule, the amount of milk a baby receives, whether the baby should have breast milk or formula, and sleep/awake activity patterns of each infant.

Because this study offers a good control group of healthy children, Ludington said, a broader study with thousands of children will determine if those growth patterns hold up for all children, as well as healthy ones.

Provided by Case Western Reserve University

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