Infant weight gain linked to childhood obesity

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Rapid weight gain during the first six months of life may place a child at risk for obesity by age 3, the researchers found.

(PhysOrg.com) -- As childhood obesity continues its thirty-year advance from occasional curiosity to cultural epidemic, health care providers are struggling to find out why--and the reasons are many. Increasingly sedentary environments for both adults and children, as well as cheap and ubiquitous processed foods no doubt play a role, but researchers are finding more evidence that the first clues for childhood obesity may begin as far back as early infancy.

A new study led by researchers in the Department of Ambulatory Care and Prevention at Harvard Medical School and Harvard Pilgrim Health

Care, as well as Children's Hospital Boston, has found that rapid weight gain during the first six months of life may place a child at risk for obesity by age 3.

"There is increasing evidence that rapid changes in weight during infancy increase children's risk of later obesity," says lead author Elsie Taveras, assistant professor in the HMS Department of Ambulatory Care and Prevention and co-director of the One Step Ahead clinic, a pediatric overweight prevention program at Children's Hospital Boston. "The mounting evidence suggests that infancy may be a critical period during which to prevent childhood obesity and its related consequences."

These findings appear in the April edition of the journal *Pediatrics*.

Most prior studies examining the relationship between infant weight gain and later childhood obesity focus primarily on body weight. However, measures of length, in addition to weight, together reflect body fatness better than weight alone. In this study, Dr. Taveras and colleagues in the HMS Department of Ambulatory Care and Prevention examined how weight and body length, or weight-for-length, in infancy can influence later obesity.

The team mined self-reported data from Project Viva, an ongoing study led by Matthew Gillman, senior author on the paper, of more than 2,000 pregnant women and their children. They isolated a subgroup of 559 mother/child pairs and studied patterns of weight gain in infancy and their subsequent three-year effect. In addition to looking at static weight and length measures, the team also looked at weight gain as a dynamic process, measuring not only how much but how quickly an infant gained weight.

The connection between rapid infant weight gain and later obesity was striking, even after adjusting for factors such as premature babies or

those underweight at birth. Take for example two infants with the same birth weight who, after six months, weigh 7.7 kg (16.9 pounds) and 8.4 kg (18.4 pounds), a 0.7 kg (1.5 pounds) difference. According to study estimates, the heavier of these two infants would have a 40% higher risk of obesity at age 3 (after adjusting for potential confounders).

While this study confirms earlier ones examining the relation between infancy and childhood weight, there were certain limitations. For example, the researchers weren't able to examine social and behavioral interactions around feeding between parents and infants. And while families in the study represented various ethnic backgrounds, they were fairly homogeneous socioeconomically, so there may be some question regarding how widely the results can be generalized.

Still, when seen in the context of other research, the relationship between infant and childhood weight is compelling.

"There is still a lot more we need to understand about the mechanisms of how this all fits together," says Taveras. "But this data clearly shows how the earliest interventions might actually have very long-term benefits."

Taveras also points out that these findings provide initial evidence that our cultural affirmation of infants who top the growth charts, and even our notions of appropriate weight gain during pregnancy, may prove to be excessive.

"At first it may seem implausible that weight gain over just a few months early in infancy could have long-term health consequences, but it makes sense because so much of human development takes place during that period—and even before birth," says Matthew Gillman, director of the department's Obesity Prevention Program. "Now we need to find out how to modify weight gain in infancy in ways that balance the needs of the brain and the body."

More information: "Weight Status in the First 6 Months of Life and Obesity at 3 Years of Age," *Pediatrics*, Volume 123, Number 4, April 2009

Source: Harvard Medical School