

Infections during infancy more closely associated with childhood obesity risk

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Infections during infancy - rather than antibiotic use, as previously suspected - were associated with an increased risk of childhood obesity in a Kaiser Permanente study of more than 260,000 infants over 16 years. The findings were published today in *The Lancet Diabetes & Endocrinology*.

"In previous studies, antibiotics used to treat infant infections have been associated with weight gain. However, we separated the two factors and found that antibiotics do not, themselves, appear to be associated with [childhood obesity](#)," said De-Kun Li, MD, PhD, principal investigator of the study and a reproductive and perinatal epidemiologist at the Kaiser Permanente Division of Research in Oakland, California.

"Our study is one of the largest analyses of the interplay among infections, antibiotic use and childhood obesity, and adds important evidence to a small but growing body of research on how the microbiome, or gut bacteria, may be affecting children's development."

In the United States, more than one-third of children and adolescents are overweight or obese, according to the Centers for Disease Control and Prevention. Research has shown that energy imbalance (calories consumed versus energy expenditures) cannot account for the entire increase in obesity in childhood.

Scientists are exploring numerous factors that may play a role in growth and development during early childhood, including chemicals in the

environment, maternal gestational diabetes, and the metabolic programming of body weight during early childhood. Both infections and antibiotic use have been shown to influence the composition of intestinal microorganisms; the intestinal microbiome can affect metabolic processes and the immune system, which can in turn affect metabolic processes, growth patterns and weight development.

In this study, researchers reviewed 260,556 births that occurred between January 1, 1997, and March 31, 2013, at Kaiser Permanente facilities in Northern California. Kaiser Permanente's comprehensive electronic medical record, Kaiser Permanente HealthConnect, allowed researchers to obtain data on infections and antibiotic use in infancy, and to capture heights and weights measured in these children for up to 18 years. All infant infections were included, with respiratory and ear infections accounting for the majority.

The electronic medical record provided additional information that allowed Dr. Li's team to control for potential confounding factors, such as maternal smoking during pregnancy, pre-pregnancy body mass index, race/ethnicity and breastfeeding.

Children diagnosed with an [infection](#) during their first year of life who had no antibiotic use were about 25 percent more likely to become obese (defined as in the 95th percentile for body mass index of all children studied) compared to those without infections. There was a dose-response relationship, meaning that higher numbers of untreated infections were associated with a larger increased risk of obesity.

In contrast, there was no increased risk of obesity associated with antibiotic use during the first year when compared to [infants](#) with untreated infections. The type of antibiotics used (broad or narrow spectrum) did not influence the outcomes. Researchers recommend focusing efforts on reducing infections in [infancy](#) while being careful in

prescribing antibiotics.

Provided by Kaiser Permanente

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