

Understanding the unique nature of children's bodies and brains

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With the increase in childhood obesity and the associated increase in type 2 diabetes among children and adolescents, there is growing interest in how children's bodies process the foods they eat and how obesity and diabetes begin to develop at early ages. Two studies presented at the American Diabetes Association's 74th Scientific Sessions help to shed light on this topic.

One study, by researchers at the Yale School of Medicine, compared how the brains of adolescents and adults differed in their response to ingestion of a glucose drink. It found that in adolescents, glucose increased the blood flow in the regions of the brain implicated in reward-motivation and decision-making, whereas in adults, it decreased the [blood flow](#) in these regions.

"While we cannot speculate directly about how glucose ingestion may influence behavior, certainly we have shown that there are differences in how adults and adolescents respond to glucose," said lead researcher Ania Jastreboff, MD, PhD, an Assistant Professor of Medicine and Pediatrics at the Yale School of Medicine. "This is important because adolescents are the highest consumers of dietary added sugars. This is just the first step in understanding what is happening in the adolescent brain in response to consumption of sugary drinks. Ultimately, it will be important to investigate whether such exposure to sugar during adolescence impacts food and drink consumption, and whether it relates to the development of obesity."

Another study, by researchers in Germany at the University Children's Hospital in Leipzig, compared fat cell composition and biology in lean and obese children and [adolescents](#). They found that when children become obese, beginning as early as age six, there was an increase in the number of adipose cells, and that they are larger in size than the cells found in the bodies of lean children. The researchers also found evidence of dysfunction of the fat cells of obese children, including signs of inflammation, which can lead to insulin resistance, diabetes and other problems, such as [high blood pressure](#).

"Our research shows that [obese children](#) start to have not only more but also larger adipocytes, or [fat cells](#), at a very young age and that this is associated with increased inflammation and is linked to impaired metabolic function," said lead researcher Antje Körner, MD, Professor of Pediatrics and Pediatric Researcher at the Pediatric Research Center, University Children's Hospital, Leipzig. "What we were interested in was seeing whether something was already going on with the adipose tissue itself if the children become obese at an early age, and it appears that there is. It's important because this can contribute to the development of comorbidities of obesity in children, such as diabetes."

Provided by American Diabetes Association

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