

Study finds inflammation linked to obesity in adults may be protective in young children

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The first study of its kind, led by Melinda Sothern, PhD, CEP, Professor and Director of Behavioral and Community Health Sciences at LSU Health Sciences Center New Orleans School of Public Health, reveals that the same pro-inflammatory proteins linked to obesity and the metabolic syndrome in adults appear to protect children prior to puberty. The findings are published online in the *International Journal of Obesity* in the Accepted Article Preview.

"With <u>obesity</u> now at epidemic proportions along with a rise in the number of those with the <u>metabolic syndrome</u>, it is crucial that we better understand how and when obesity and insulin resistance develop," notes Dr. Sothern. "In adults, obesity is linked to inflammation. In young children, however, the relationship between inflammation and body fat is unclear."

The research team studied a group of healthy obese and non-obese African-American and Caucasian children, 7-9 years old who had not yet entered puberty. They looked at circulating pro and anti-inflammatory molecules, abdominal fat, BMI, insulin resistance, fatty tissue beneath the skin, fat in the liver, and total fat in order to better understand the role inflammation plays in the development of obesity and insulin resistance.

"We found that relationships between pro-inflammatory and metabolic markers commonly observed in adults were reversed in healthy, African-American and Caucasian obese and non-obese children who had not yet



entered puberty," says Dr. Sothern.

Although the pro-inflammatory proteins associated with obesity may cause damage to the heart, blood vessels and insulin function in adults, in this group of young children, they appear to be helpful. The researchers pose a number of explanations for their findings. Normal growth may temporarily increase inflammation, and the presence of the inflammatory biomarkers may actually preserve glucose stability. It may also be that the presence of an existing inflammatory environment is crucial for defending the body against infection, allergies, and other insults prior to puberty. Also, both metabolism and inflammation are affected by physical activity, which is higher in young, healthy children as opposed to adults.

"The chronic nature of this inflammatory environment, while beneficial during developmental stages, may, however, lead to undesirable immune responses associated with disease later in life," says lead author Jovanny Zabaleta, PhD, Assistant Professor-Research in the Department of Pediatrics and the Stanley S. Scott Cancer Center at LSU Health Sciences Center New Orleans.

The World Health Organization (WHO) projects there will be more than 2 billion overweight and more than 700 million obese adults by 2015. Obesity affects all ethnicities, but in the US, minority populations and those from disadvantaged backgrounds are most affected. Similar trends are found in <u>young children</u> prior to puberty whose obesity continues into adolescence. Remarkably, more than half of overweight adolescents carry this condition into adulthood.

"Further studies are needed to determine how these inverse relationships modify chronic disease risk later in life as these unexpected findings provide compelling evidence to inform clinical practice, especially in severely obese pre-pubertal <u>children</u> with related inflammatory



conditions such as asthma, fatty liver disease, and <u>insulin resistance</u>," concludes Dr. Sothern.

Provided by Louisiana State University

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