

Study finds early predictors of metabolic syndrome in healthy 7-9 year-olds

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Melinda Sothorn, PhD, CEP, Professor of Public Health and Director of Health Promotion at LSU Health Sciences Center New Orleans, will present evidence that supports relationships seen in adolescents between insulin sensitivity and fatty liver, belly fat, and total body fat and identifies additional potential early markers of insulin resistance and metabolic syndrome in healthy 7-9 year-old children, including fat in muscle cells, blood pressure, physical activity, and birth weight. Dr. Sothorn will present findings of the Early Markers for the Metabolic Syndrome in Youth today in Stockholm at the International Congress on Obesity.

The metabolic syndrome develops during childhood and is associated with several early risk factors including low birth weight, identified by Dr. Sothorn for the first time in children as young as seven prior to entering puberty, in a preliminary study. Markers that may precede the metabolic syndrome and mechanisms that explain these relationships have yet to be identified. These mechanisms may originate in the intrauterine environment, be exacerbated in susceptible populations, such as African Americans and, be further promoted by a [genetic predisposition](#), particularly among African American children. These abnormalities may work synergistically to create a childhood metabolic syndrome phenotype and may originate earlier in youth than previously proposed.

The purpose of the study was to explore potential correlates of [insulin sensitivity](#), fasting insulin, and [insulin resistance](#), and to determine the

best model to predict them in young children. The study of more than 100 healthy children, ages 7-9, found that fat in the liver, abdominal fat, and fat oxidation predicted insulin resistance and appear to be early markers for the metabolic syndrome via a mechanism of impaired [lipid metabolism](#) and fat oxidation. Impaired metabolic function may be due, in part, to pre-and post natal factors that are modified by current physical activity. Therefore, race, low or high pregnancy weight and/or birth weight, and low physical activity collectively create a phenotype for poor metabolic function leading to increased risk for insulin resistance in young children.

"Although some of the risk factors cannot be changed, pregnancy weight, birth weight, and physical activity can all be modified and are targets for early intervention to prevent or delay insulin resistance and reduce the risk for metabolic syndrome," noted Dr. Sothorn, who is the study's principal investigator.

The research team which also included Drs. Stuart Chalew, LSUHSC Professor of Pediatrics and Head of Pediatric Endocrinology, William Cefalu, Professor and Chief of Endocrinology, Stewart Gordon, Professor of Pediatrics, Julia Volaufova, Professor of Biostatistics, and LSUHSC Research Associate Brian Bennett as well as scientists from the LSU Pennington Biomedical Research Center, the University of Wyoming, and the University of Alabama at Birmingham, concluded that prospective studies are needed to confirm these findings.

Metabolic syndrome is a group of risk factors linked to overweight and obesity that increase the incidence of heart disease, diabetes, and stroke. In general, a person with metabolic syndrome is twice as likely to develop heart disease and five times as likely to develop diabetes as someone without metabolic syndrome. According to the National Institutes of Health, metabolic syndrome is diagnosed when a person has at least three of the following risk factors: abdominal obesity, high

triglycerides, low High Density Lipoprotein (HDL), high blood pressure, and high blood sugar. The development metabolic syndrome is closely associated with being overweight, lack of [physical activity](#) and genetics and ethnicity.

"A genetic predisposition for [metabolic syndrome](#) with risk factors occurring early in life makes it even more important to control the risk factors that we can such as being physically active and maintaining healthy weight," noted Dr. Sothern.

Provided by Louisiana State University Health Sciences Center

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