Researchers first to document early signs for diabetes in kids as young as 7

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Research conducted under the direction of Melinda Sothern, PhD, Professor and Director of Health Promotion at the LSU Health Sciences Center New Orleans School of Public Health, showing early signs of diabetes in healthy children as young as seven years old will be presented at the American Diabetes Association 2009 Annual Scientific Session Meeting in New Orleans. Dr. Sothern's group is the first to document previously unknown markers for obesity, heart disease and diabetes, collectively called the Metabolic Syndrome, in children this young.

Data reported are from 118 healthy children, age 7 - 9 years old, enrolled in LSUHSC's ongoing Study of Insulin-sensitivity in Louisiana Low-birth-weight Youth (SILLY). LSUHSC's Dr. Sothern is the principal investigator of the NIH-funded study which is investigating the importance of birth weight to diabetes.

The increasing prevalence of type 2 diabetes mellitus in children parallels the pediatric obesity epidemic. According to the American Academy of Pediatrics, over the past two decades, the prevalence of children who are obese has doubled, while the number of adolescents who are obese has tripled. And according to the National Health and Nutrition Examination Survey, 31.9% of children and adolescents were overweight (BMI at or above the 85th percentile) and 16.3% were obese (BMI at or above 95th percentile).

Insulin resistance/poor insulin sensitivity is closely associated with increased total body fat and may precede development of the metabolic

syndrome and type 2 diabetes. Indicators of impaired insulin sensitivity have yet to be clearly identified in children prior to puberty.

The LSUHSC researchers found that the child's current fat weight is the strongest predictor for poor insulin sensitivity which is a risk factor for type 2 diabetes. LDL (bad cholesterol) was also strongly associated with insulin sensitivity in the prediction model. Previously unidentified Metabolic Syndrome markers discovered by Dr. Sothern's team include:

- Fat in the liver cells and fat in the skeletal (leg) muscle cells also predict poor insulin sensitivity and high insulin resistance (pre-diabetes) along with an impaired fat burning ability in the muscles.

- These relationships were only found after the researchers considered the child's current fat weight, so the strongest predictor is whether or not these young children are currently overweight or obese.

- The fat in the skeletal muscle became less important after Dr. Sothern's team considered the mother's weight prior to and during pregnancy, whether the child was breast-fed, and the current physical activity level of these young children.

"This means that if the mother has a healthy weight gain during pregnancy and the child is breast-fed and physically active, the fat may not accumulate in the skeletal muscle and/or liver and the child may not experience an impaired fat burning ability in the muscle. All of these factors are significantly associated with poor insulin sensitivity that may eventually lead to type 2 diabetes in adolescence or young adulthood. We hope to conduct future prospective studies in this cohort of healthy children to confirm this finding," notes Dr. Melinda Sothern, LSU Health Sciences Center New Orleans Professor of Public Health and

study leader.

Collectively, fat oxidation (how well the body is able to utilize fat as a fuel), blood pressure, and lipids (HDL and LDL) were identified as the best physiologic predictors of insulin sensitivity.

Arlette Soros, MD, an LSUHSC Pediatrics fellow who is a member of Dr. Sothern's research team, is presenting results of the first study to examine why some children become hypoglycemic (low blood sugar) during insulin sensitivity testing. She will report that children who are lean and have less fat in their skeletal muscle are more likely to get hypoglycemia. Also those with the best insulin sensitivity were the most likely to get low blood sugar.

"We are not sure why this is but think they may be more fit and less prone to diabetes," concludes Dr. Sothern.

Source: Louisiana State University Health Sciences Center