Tracking Obesity Among Hispanic Children in the United States

Sometimes a lack of willpower is not to blame for obesity. Nancy F. Butte, an energy expert at the ARS Children's Nutrition Research Center (CNRC) in Houston, Texas, is looking at a complex of factors that may explain rising obesity in Hispanic children.

The CNRC, in collaboration with the Southwest Foundation for Biomedical Research (SWFBR), is in the third year of a 5-year study titled "¡Viva la Familia!" or "Long Live the Family!" A professor of pediatrics at Baylor College of Medicine, Butte is the study's principal researcher. Cooperating are Baylor's Kenneth J. Ellis, professor of pediatrics; Jennifer O. Fisher, assistant professor of pediatrics; Carlos A. Bacino, assistant professor in molecular and human genetics; and Anthony G. Comuzzie and Shelley Cole, geneticists at the SWFBR in San Antonio, Texas.

Childhood obesity is more prevalent among Hispanic children than in other ethnic groups, and the U.S. problem has been steadily increasing over the past decade. Researchers will investigate, for the first time, the causes of childhood-onset obesity within the Hispanic population. They hope to identify genetic and environmental factors that make some children more prone to excess weight gain. Preliminary results have already shown that 40 to 60 percent of the factors leading to obesity may be genetic.

"We know that obesity is a complicated issue," says Butte. "A handful of susceptibility genes, yet unidentified, are readily expressed in our current environment of plentiful food and sedentary lifestyles. Major genes interact with the environment. This research may lead us to a better understanding of why Hispanic children are more obese than others."

In-depth metabolic and physiologic testing of the children and their parents will be done in three phases at the CNRC's Metabolic Research Unit.

First, volunteer children and parents will be checked for weight and height and for vital signs, such as heart rate, blood pressure, and body temperature. Parents will give blood samples for genetic analysis, while children go through an exercise test to measure the amount of oxygen they use while walking on a treadmill—an indicator of physical fitness. Children and parents will have body composition scans using dual energy X-ray absorptiometry to measure lean tissue and body fat. Researchers will ask the children what they've eaten and what foods and beverages they generally eat.

In the next phase, the children's energy expenditures will be measured in a room calorimeter, which is a sealed chamber in which their oxygen uptake and carbon dioxide output can be monitored for 24 hours. The calorimeter is equipped with a bed, toilet, sink, desk, radio, television, CD player, and telephone. Communication with parents, siblings, and staff can be maintained via window, phone, and intercom throughout the test period. A blood sample will be taken for genetic and biochemical analyses. At the end of the 1-day tests, the children will wear an accelerometer monitor secured on a belt to measure their physical activity for the next 3 days.

The final phase takes place a year later, when the children's weight, height, and body composition will once again be measured. At this time, with the phenotypic information now in hand, connections will be made between specific genes or genetic patterns and gain in weight, body fat, and other factors.

The geneticists in San Antonio will perform a genomic scan on the blood samples from the parents and children using about 360 genetic markers. Genetic statistical analysis will be performed on the nuclear-family data to search for genes influencing obesity in Hispanic children.—By **Alfredo Flores,** ARS.

This research is part of Human Nutrition, an ARS National Program (#107) described on the World Wide Web at www.nps.ars.usda.gov.

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A young study participant exercises in a calorimeter as part of ARS research on obesity in Hispanic children.