Weight gain associated with aging marker

A report published in the May 3 2005 issue of the American Heart Association journal *Circulation* demonstrated that weight gain and increased insulin resistance result in greater telomere shortening over time. Telomeres are the genetic material at the end of chromosomes that become progressively eroded with age and oxidative stress. Telomere length has been proposed as a marker of biological, as opposed to chronological, aging.

The study examined blood samples from 49 young men and women who participated in the Bogalusa Heart Study. Blood samples obtained from initial visits between 1988 and 1991 and during follow up visits from 2000 to 2001 were analyzed for fasting glucose and insulin, and white blood cell telomere length. In addition, the homeostasis model of insulin resistance (HOMA-IR) was determined. Height and weight were measured at both visits and body mass index calculated.

Increases in both body mass index and insulin resistance as determined by HOMA-IR were significantly correlated with reduction in telomere length. The change in HOMA-IR was also correlated with change in body mass index. Of only three participants whose telomere length increased, two had lost weight and showed less insulin resistance during the 10 to 12 year interval between visits.

The authors, from the University of Medicine and Dentistry of New Jersey and Tulane University in New Orleans, speculate that “oxidative stress, by enhancing telomere erosion per replication, and inflammation, through increasing WBC [white blood cell] turnover, are responsible for the increase in telomere erosion with a rise in insulin resistance in the present study cohort.” They conclude that “Insulin resistance and obesity accelerate aging because they are states of increased oxidative stress and inflammation, which bring about a shorter lifespan. In biological terms, an accelerated WBC telomere attrition rate in insulin resistance and obese states is an affirmation of this concept.”