

# Obesity in Adolescence Raises Risk for Later MS

BY SALLY KOCH KUBETIN

Being obese at 18 years of age can double a woman's later risk for multiple sclerosis, according to an analysis of data from two large, longitudinal cohorts.

The finding that weight during adolescence but not childhood or adulthood is associated with a twofold increased risk for MS further supports a growing body of evidence that the teenage years are important in the etiology of the demyelinating disorder, reported Kassandra L. Munger, Sc.D., of Harvard School of Public Health, Boston, and her associates.

According to previous research, the mechanism of the association might hinge on the low levels of serum 25-hydroxyvitamin D, a marker of vitamin D status, in obese individuals. Vitamin D is an immunomodulator that has been found to reduce the incidence and pro-

gression of MS in animal studies when present in high levels. Current thinking holds that the relatively low levels in obese adolescents could be an important risk factor, according to Dr. Munger.

The Nurses' Health Study (NHS) began in 1976 and involved 121,700 female, married registered nurses aged 30-55 years and living in 1 of 11 states at the time of enrollment.

The Nurses' Health Study II (NHSII) involved 116,671 female, married registered nurses who enrolled in 1989 when they were between the ages of 25 and 42 years, and lived in 1 of 14 states. Participants completed questionnaires on their health behavior and medical information every 2 years.

The researchers identified 241 women diagnosed with MS between 1976 and June 2002 in the NHS cohort. Of these, 166 cases were defined as definite and 75 as probable in the assessment by the pa-

tients' neurologists. Among the NHSII cohort, 352 women were diagnosed with MS between 1989 and June 2003; of these, 278 cases were definite, 74 probable.

Obesity during adolescence and adulthood was assessed using body mass index. The baseline questionnaires in 1976 (NHS) and 1989 (NHSII) included current weight and height. A later questionnaire completed in 1980 for the NHS cohort and 1989 for the NHSII cohort included data on their weight at age 18. In 1988 (NHS) and 1989 (NHSII), childhood BMI was determined by having women select which of nine silhouettes ranging from very thin to extremely obese best represented their body size at ages 5, 10, and 20 years.

Women with a BMI of 30 kg/m<sup>2</sup> at age 18 had a greater than twofold risk of developing MS, compared with women whose BMI fell between 18.5 and 20.9 kg/m<sup>2</sup>, according to findings from age-

adjusted analyses. The association held after researchers accounted for several confounding variables such as smoking, latitude of residence at age 15, and ethnicity (Neurology 2009;73:1543-50).

Women who reported having larger body silhouettes at age 20 also had a twofold greater risk for MS, compared with those who reported a thinner body.

The risk for MS was not affected by obesity in childhood or at the age at the time of enrollment in either study.

Women with MS weighed less than did unaffected women. The decrease in relative weight occurred after the diagnosis, a finding that is consistent with those of previous studies.

Dr. Munger reported receiving travel and speaker honoraria from the Consortium of Multiple Sclerosis Centers and speaker honoraria from the National Multiple Sclerosis Society. Her associates reported several disclosures. ■

## South Asians' High Fat/Low Lean Mass Linked to Higher Insulin Levels

BY KERRI WACHTER

South Asian men and women appear to have a high fat/low lean mass phenotype that may put them at greater risk for insulin resistance and diabetes, based on a study of individuals in four ethnic groups.

"Ethnic differences in lean mass do occur, such that South Asian men and women have significantly less lean mass than Aboriginal, Chinese, and European men and women of the same body size," noted lead author Scott A. Lear, Ph.D. "South Asians have a distinct phenotype of high fat mass and low lean mass," which may account for a substantial portion of their higher insulin levels compared with other ethnic groups.

A total of 828 participants were recruited as part of the Multicultural Community Health Assessment Trial, involving individuals of exclusive Aboriginal, Chinese, European, and South Asian origin. Body mass index ranges were less than 24.9 kg/m<sup>2</sup>, 25-29.9 kg/m<sup>2</sup>, and 30 kg/m<sup>2</sup> or greater.

Total body fat was moderately correlated with total body lean mass in both sexes of all four ethnic groups. Aboriginal, Chinese, and European men had 3.42 kg, 3.01 kg, and 3.57 kg more lean mass, respectively, than did South Asian men at a given total fat mass. Likewise, Aboriginal, Chinese, and European women had

1.98 kg, 2.24 kg, and 2.97 kg more lean mass than did South Asian women at a given total fat mass. "These models accounted for 66% and 63% of the variation in lean mass for men and women, respectively," the researchers wrote (J. Clin. Endocrinol. Metab. 2009, Oct. 9 [doi: 10.1210/jc.2009-1030]).

The fat mass to lean mass (F:LM) ratio was significantly

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greater for South Asian men compared with Chinese and European men and there was a trend toward a greater F:LM ratio compared with Aboriginal men. Likewise, the F:LM ratio was also significantly greater for South Asian women compared with Chinese, European, and Aboriginal women. These relationships persisted after adjustment for age, height, humerus breadth, smoking status, physical activity, and diet (and menopausal status in women).

"South Asian men and women have a lower lean mass at a given fat mass even when taking into account possible confounders such as lifestyle habits known to affect body composition," noted Dr. Lear, professor

of biomedical physiology and kinesiology at Simon Fraser University, Vancouver, B.C., and his coinvestigators.

In a post hoc analysis, insulin and homeostasis model assessment (HOMA) levels were significantly greater for South Asian men than for Chinese and European men, even after adjustment for total body fat mass, age, height, humerus breadth, diet, and physical activity. When the models were adjusted for differences in the F:LM ratios instead of total body fat mass, there were no longer any differences in insulin or HOMA levels among the groups.

South Asian women had significantly greater insulin levels than did Chinese women in a similar post hoc analysis. There were no differences in HOMA between the groups. After adjustment for total body fat mass, age, menopausal status, height, humerus breadth, diet, and physical activity, South Asian women had significantly greater insulin and HOMA values than did Chinese and European women. As with men, when the models were adjusted for differences in the F:LM ratios instead of total body fat mass, there were no longer any differences in insulin or HOMA levels.

The study was supported by the Canadian Institutes of Health Research, Institute of Nutrition, Metabolism, and Diabetes. The authors reported that they had no conflicts of interest. ■

## Overweight at Type 1A Diagnosis on the Rise

BY MIRIAM E. TUCKER

MONTREAL — At the onset of autoimmune diabetes, nearly half of African American children and almost one in five white children seen at Children's Hospital of Pittsburgh during 2004-2006 were overweight.

Those figures represent dramatic increases from the 1980s, when just 7% of African American and 3% of white children seen at the hospital were overweight at onset of autoimmune (type 1A) diabetes, Dr. Ingrid Libman reported in a poster presentation at the World Diabetes Congress.

Dr. Libman, a pediatric endocrinologist at the hospital, and her associates reported earlier that among children treated with insulin, the prevalence of overweight (body mass index of 85th percentile or greater) increased from 13% during 1979-1989 to 37% during 1990-1998 in white children, and from 22% to 55% during those two study periods in black children (Diabetes Care 2003;26:2871-5). In those with at least one antibody, the prevalence of overweight rose from 5% to 24%.

This time, they compared the period 1999-2006 (excluding 2003) with the previous two study periods. Data were available for 298

children out of 376 diagnosed with diabetes and treated with insulin during that time. Overall, the prevalence of overweight had more than tripled since 1979-1989, to 41%. Mean BMI percentile rose from 40.4 during 1979-1989 to 58.8 in 1990-1998 to 60.4 in 1999-2006.

Among 219 children for whom beta-cell antibody levels were available during all three periods, 173 (79%) were positive for at least one. This proportion was similar in each of the three time periods, Dr. Libman noted.

Of the 173 children with one or more antibodies, the proportions who were overweight rose from 5% to 25% to 31% during the three time periods. In contrast, the proportions overweight among the 46 with no antibodies—i.e., presumably with type 2 diabetes—were 46%, 70%, and 75%, respectively. The increase in overweight was more noticeable in the African American children with autoimmunity—from 7% to 38% to 46%, respectively, compared with 3%, 14%, and 19% of the white children.

Experts believe that weight excess plays an "accelerator" role in the ongoing increase in type 1A diabetes, Dr. Libman said in an interview.

Dr. Libman indicated that she had no conflicts of interest. ■