Both hepatic and visceral fat contribute to ethnic differences in cardiometabolic risk factors

By Victoria Stern

NEW YORK (Reuters Health) –Hepatic fat, independent of visceral fat, may contribute to a worse cardiometabolic risk profile regardless of ethnicity, a new study suggests.

The study, published online June 23 in American Journal of Clinical Nutrition, found that liver fat predicted large very-low-density lipoprotein (VLDL) concentrations in African Americans, whites and Hispanics.

“The results also help explain the different metabolic risk profiles observed in African Americans, whites and Hispanics,” study investigator Dr. Sonia Caprio, from Yale University, told Reuters Health in a phone interview. African Americans are less likely to have fatty livers, which may explain why they tend to have more favorable metabolic risk profiles compared to whites and Hispanics.

The prevailing theory is that visceral adipose tissue (VAT) has deleterious metabolic effects in adults. However, emerging evidence suggests that liver fat distribution may also play a pivotal role in determining the different lipoprotein profiles among African Americans, whites and Hispanics.

Dr. Caprio and her colleagues recruited 33 white, 33 African American, and 33 Hispanic obese adolescents with normal glucose tolerance from the Yale Pediatric Obesity Clinic, and measured VAT and hepatic fat fraction (HFF) as well as fasting lipoprotein particle number and size.

Although African American youths had a greater body fat percentage than either whites ($P=0.006$) or Hispanics ($P=0.007$), overall they had a more favorable metabolic risk profile.

African Americans had lower triglyceride ($P=0.001$) and higher HDL ($P=0.03$) concentrations as well as lower concentrations of total ($P=0.007$), large ($P=0.005$), and medium VLDL ($P<0.0001$).

In addition, VAT and HFF were significantly higher in Hispanic (VAT, $P<0.0001$; HFF, $P=0.01$) and in white youths (VAT, $P<0.0001$; HFF, $P=0.001$) than in African Americans.

However, regardless of ethnicity, liver fat played an important role in determining patients’ cardiometabolic risk profile. In multivariate linear models, VAT predicted large HDL ($P=0.003$) and total small LDL ($P=0.001$) concentrations, while HFF predicted large VLDL concentrations in the three ethnic groups.

Dr. Caprio went a step further in a new study, to be published online in July in Diabetes Care, comparing people with equal visceral fat contents but discordant liver fat contents. Dr. Caprio and her colleagues found that only subjects with more liver fat had abnormal metabolic profiles.

Although the current study focused on how patterns of fat distribution may be linked to ethnic differences in lipoprotein profiles, the researchers note that genetically driven interethnic differences also need to be considered in future studies.

http://www.ajcn.org/cgi/content/abstract/ajcn.2010.29270v1

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