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Waist Size, Not BMI , Predicts Risk of Diabetes

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October 08, 2010

MedPage Today Action Points

- Explain to interested patients that a study found a larger waist circumference for Americans, especially women, accounted for most of the increased incidence of type 2 diabetes in Americans compared to the British.
- Note that American women did not have significantly higher BMI than their British counterparts but had significantly larger waist circumferences at all BMI categories.

Review

American adults have larger waists than their British counterparts, which can account for their significantly greater prevalence of type 2 diabetes, a study suggested.

The prevalence of diabetes is nearly twice as high among Americans as among the British, and this difference can't be fully explained by differences in risk factors such as age and smoking or body mass index (BMI), according to James Banks, PhD, of the Institute for Fiscal Studies in London, and colleagues.

Writing online in the *Journal of Epidemiology and Community Health*, the researchers reported that significant differences were found when mean waist circumferences were compared for Americans and the English:

- Men, 104.44 cm versus 101.59 ($P=0.05$)
- Women, 95.94 cm versus 90.99 cm ($P=0.05$)

Recent research has suggested that aspects of body shape other than BMI differ among populations and may help explain diabetes risk.

"BMI provides a crude index of adiposity by not considering central fat mass, which is more strongly associated with disease risk," the researchers observed.

To examine the potential role of visceral fat and waist circumference, Banks' group analyzed data from 6,888 participants in the English Longitudinal Study of Aging and 4,570 participants in the U.S. National Health and Nutrition Examination Survey, both nationally representative cohorts.

Study subjects ranged in age from 52 to 85 years, and only non-Hispanic whites were included.

The prevalence of type 2 diabetes was 16% in American men and 11% in British men, while the corresponding numbers for women were 14% and 7% ($P=0.05$).

Conventional risk factors differed little between the Americans and the English, with Americans being somewhat taller and having only slightly higher BMIs (28.12 versus 27.84 for men, 28.01 versus 28.04 for women).

The English tended to be slightly less educated and have higher rates of smoking, which are generally considered to increase, rather than decrease, the risk of diabetes.

The researchers then examined rates of obesity (BMI over 30), overweight (BMI between 25 and 30), and normal (BMI below 25), and found that rates of obesity were higher for American men than for British men (31.6% versus 26.7%).

Rates of obesity for American women, however, were only slightly and nonsignificantly higher than for British women (32.9% versus 30.6%).

This difference for women was "not large enough to explain a two-to-one diabetes prevalence differential between countries," the researchers noted.

Fewer American women also were overweight, and more were of normal weight.

"Give these BMI distributions, it is unsurprising that BMI alone cannot explain higher diabetes rate among Americans," they observed.

The sole factor that helped explain the diabetes differential was waist circumference, according to the researchers.

Waist circumferences were characterized as low risk (less than 94 cm for men and 80 cm for women), moderate risk (94 to 101 cm for men and 80 to 88 cm for women), and high risk (at or above 102 cm for men and 88 cm for women).

Among the overweight, the waist circumference of 56% of American men and 41% of British men were high risk.

High-risk waist circumference was seen in 87% and 61% of overweight American and British women, respectively.

Even among American women who were of normal weight, 40.6% had waist circumferences that were high risk, compared with only 8.9% of British women.

In a series of regression models looking at between-country differences in diabetes, using covariates including age, height, education, marital status, and smoking, the researchers then found that, after controlling for waist circumference, there was no significant effect for BMI.

In contrast, waist risk was strongly associated with diabetes, and the risk increased with

higher circumference.

Possible contributors to central adiposity among Americans, according to Banks and colleagues, include lack of exercise, diet, and a psychosocial environment that could be considered more stressful.

They further explained that fat cells deposited in the viscera are distinct from those found elsewhere.

"Central fat cells have a higher turnover rate of triglycerides and produce more proinflammatory and metabolic markers," the researchers explained.

In addition, these cells draw free fatty acids to the liver, which can further contribute to insulin resistance and ultimately, to diabetes, according to the researchers.

The authors had no financial disclosures.

Primary source: Journal of Epidemiology and Community Health

Source reference:

Banks J, et al "What explains the American disadvantage in health compared to the English? the case of diabetes" *J Epidemiol Community Health* 2010; DOI: 10.1136/jech.2010.108415.

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