

INTERNALIZED RACISM, BODY FAT DISTRIBUTION, AND ABNORMAL FASTING GLUCOSE AMONG AFRICAN-CARIBBEAN WOMEN IN DOMINICA, WEST INDIES

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The current study examined the relationship of internalized racism to glucose intolerance in a population of Afro-Caribbean women aged 18 to 55. Also of interest was whether this relationship would be differentially influenced by the type of body fat distribution or confounded by the level of hostility. A total of 244 women were selected from a systematic sample of households on the island of Dominica, West Indies. Demographic data together with information on internalized racism were collected by questionnaire. Anthropometric information and fasting blood glucose were also measured. Women with high levels of internalized racism exhibited an increased risk of elevated fasting glucose compared to those with low levels of internalized racism (odds ratio (OR) = 2.4; 95% confidence interval (CI) = 1.1–5.5). There was no difference in mean body mass index (BMI) by level of internalized racism. However those with high internalized racism had a significantly larger waist circumference after adjusting for age, education, hostility, and elevated fasting glucose status. In multivariate analyses controlling for age, education, hostility, and either weight or BMI, internalized racism remained independently associated with elevated fasting glucose. However, once waist circumference was included in the model, the relationship of internalized racism to elevated fasting glucose was not statistically significant. This study demonstrates a significant relationship between internalized racism and abnormal levels of fasting glucose which may be mediated through abdominal fat. The exact nature of the relationship of internalized racism to glucose intolerance may be an important area of future study. (*J Natl Med Assoc.* 2002;94:143–148.)

Key words: internalized racism ♦
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♦ body size ♦ Afro-Caribbean

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In the United States, individuals with black African ancestry have an increased risk for type 2 diabetes when compared to persons of white European origin even after controlling for known risk factors including obesity and socioeconomic status.¹ Conventional wisdom would suggest that the higher type 2 diabetes risk in African Americans might relate to their increased genetic susceptibility, resulting from

possibly a thrifty gene.² However, it is equally likely, although not often appreciated, that other factors which affect African Americans, but not necessarily European Americans, might contribute to the differential risk when the two groups are compared.

Recent cross-national studies have shown that in black African heritage populations across the diaspora, abdominal obesity is a stronger risk factor for diabetes than overall obesity, as assessed by the body mass index (BMI).³ Cross-sectional and prospective studies have also shown that psychological stress, particularly hostility, is associated with the accumulation of abdominal fat.^{4,5} These findings have raised the question whether differences in exposures to psychosocial stressors might play an indirect role in mediating differences in diabetes risk between African Americans and white Americans.

Internalized racism is one psychosocial factor that might be particularly relevant to discussions of the impact of psychological stress in Western Hemisphere blacks. It has been shown that African-American women with high levels of internalized racism exhibit increased levels of psychological stress, including anxiety and depression.⁶ Internalized racism has also been shown to be related to anxiety, depression, and abdominal obesity among African-Caribbean women on the island of Barbados.⁷ Therefore, the current study was conducted to determine if a relationship of internalized racism to glucose intolerance might exist in a population of African-Caribbean women and whether this relationship would be differentially influenced by the type of body fat distribution or confounded by the level of hostility.

MATERIALS AND METHODS

The current study was conducted between June and October 1998 and included a sample of 244 women aged 18 to 55. The women were recruited from households that were systematically chosen from all neighborhoods within the city of Roseau on the island of Dominica. One female occupant from each household

was randomly selected to participate. Individuals with previously diagnosed diabetes were excluded from the study. The participation rate was 77%. All participants signed consent forms approved by the Dominica Ministry of Health and the University of the West Indies Institutional Review Board.

Measurement of Psychosocial Variables

In the current study, internalized racism was measured using the Nandolitization Scale (NAD).⁸ Because blacks comprise the majority population in most Caribbean countries, overt experiences of racism are not part of the day-to-day experience of most African-Caribbean men and women as they are for many African Americans. However, internalized racism is one form of racism that has implications for all blacks in the Western Hemisphere. The racist propaganda of those involved in the African slave trade painted a picture of the black African as mentally defective (needing to be cared for like an animal) and physically gifted (more equipped to do work like an animal). Over centuries of enslavement, this racist propaganda has become internalized by many western Hemisphere blacks. The questions on the NAD measure the extent to which blacks have internalized each of these two racist concepts—that blacks are “physically gifted” and “mentally defective”. The Cook-Medley Hostility Inventory for Hostile Attitudes was used to measure hostility⁹ in the current study.

Measurement of Clinical Variables

Weight and height measurements were performed for each participant. Weight was measured on a balance-beam scale with participants in light clothing and no shoes. Height was measured with a wall-mounted ruler. Overall body fat was estimated by the BMI, which is calculated as weight in kilograms (kg) divided by height in meters squared (kg/m^2). Abdominal fat was estimated by the waist circumference which was measured at the umbilicus using a Gullic tape measure.¹⁰ Measurement of fasting

Table 1. Age-adjusted mean level of anthropometric parameters with 95% confidence intervals for individuals with and without abnormal glucose values.

	Abnormal Glucose*	Normal Glucose	p Value
<i>n</i>	28	216	
BMI (kg/m ²)	30.20 (27.65–32.74)	29.23 (28.34–30.12)	0.481
Waist (cm)	94.17 (89.13–99.21)	87.26 (85.48–89.05)	0.012
Internalized Racism Score	59.45 (52.25–66.66)	52.27 (49.71–54.82)	0.067
Hostility Score	69.80 (64.51–75.08)	66.89 (65.05–68.74)	0.310

*Fasting values ≥ 6.1 mmol/L.

blood glucose was preformed in duplicate on a portable One Touch II Analyzer (Lifescan Inc., Johnson & Johnson, Co. Milpitas, CA, the United States) using capillary blood samples. Clinical studies have shown that the One Touch II system can accurately determine blood glucose within $\pm 10\%$ of the true value with an average coefficient of variation of 3.3%,¹¹ and that capillary blood samples can accurately approximate serum glucose in fasting blood samples.¹² Subjects with fasting glucose ≥ 6.1 mmol/L (110 mg/dl) were classified as having an abnormal glucose level.¹³ Individual with capillary glucose ≥ 7.0 mmol/L (126 mg/dl) were referred to the local hospital for follow-up. All individuals sent for follow-up were confirmed as having elevated fasting glucose from serum samples.

Statistical analysis

Differences between variable means were assessed with the *t*-test. The Chi-square (χ^2) or Fisher's Exact Test was used to compare the frequency of dichotomous variables. The distribution of internalized racism and hostility scores were dichotomized at the median into high and low and entered into logistic regression models to examine risk relationships. Odds ratio (OR) with 95% confidence intervals were used to quantify risk estimates. All analyses were performed with Statistical Analysis System Software.¹⁴

RESULTS

The mean age of the sample was 36.6 (± 9.4) years. On average, the women showed low ed-

ucational achievement, with only 68.9% indicating that they had completed a secondary (high school) education. Of the 244 participants, 11.4% ($n = 28$) were found to have a fasting glucose ≥ 6.1 mmol/l.

Table 1 compares the age-adjusted mean levels of anthropometric variables, internalized racism score, and hostility score for participants with and without elevated fasting glucose levels. As expected, participants with elevated fasting glucose values had a larger waist circumference than those with normal fasting glucose. However, there was no difference in the age-adjusted mean BMI between the two groups. Likewise, there was no significant difference in the mean hostility scores between the two groups. The difference between mean internalized racism scores approached significance.

When the frequency of elevated fasting glucose was examined across high ($n = 120$) and low ($n = 124$) levels of internalized racism, those individuals with high levels showed a significantly ($p < 0.05$) increased frequency of elevated fasting glucose compared to those with low levels (15.8% vs. 7.3%). This difference was associated with a significant OR of 2.4 (95% CI = 1.1–5.5). When comparing the level of each anthropometric variable between those with low and high internalized racism, while adjusting for age, education, and level of hostility, there was no significant difference in mean BMI ((29.7 kg/m²; 95% CI = 28.3–31.2) vs. (30.4 kg/m²; 95% CI = 28.9–31.8), respectively) between the groups. However, the mean waist circumference for those with high

Table 2. Odds ratios (OR) with 95% confidence intervals (95% CI) and *p*-values from multiple logistic regression models relating internalized racism (INR) to abnormal fasting glucose* among African-Caribbean women age 20–55 on Dominica, West Indies.

	Model					
	Adjusted for Weight		Adjusted for BMI		Adjusted for Waist	
	OR (95% CI)	<i>p</i> value	OR (95% CI)	<i>p</i> value	OR (95% CI)	<i>p</i> value
Age	1.10 (1.04–1.15)	0.0003	1.10 (1.04–1.16)	0.0004	1.09 (1.03–1.15)	0.0025
Education†	0.65 (0.23–1.79)	0.4075	0.64 (0.23–1.76)	0.2072	0.639 (0.22–1.78)	0.3920
INR (high = 1; low = 0)	2.49 (1.01–6.14)	0.0461	2.56 (1.03–6.31)	0.0307	2.02 (0.80–5.09)	0.1344
Hostility (high = 1; low = 0)	1.01 (0.97–1.04)	0.5253	1.01 (0.98–1.04)	0.5174	1.00 (0.97–1.04)	0.6457
Weight	1.00 (0.98–1.01)	0.8595	–	–	–	–
BMI (kg/m ²)	–	–	0.99 (0.97–1.02)	0.6966	–	–
Waist (cm)	–	–	–	–	1.03 (1.00–1.07)	0.0326

*Abnormal fasting glucose based on fasting glucose values ≥ 6.1 mmol/L; †Highest grade completed.

internalized racism (90.4 cm; 95% CI = 88.0–92.8) was significantly ($p = 0.007$) greater than for those with low internalized racism (85.7cm; 95% CI = 83.3–88.0). This significant difference in mean waist circumference by level of internalized racism persisted after adjusting for the presence of elevated fasting glucose (data not shown).

Table 2 shows the results of multiple logistic regression analyses to assess the relationship of internalized racism to abnormal fasting glucose while controlling for age, education, hostility, and anthropometric measurements. The data show that in the models where BMI and weight are the anthropometric measurements, internalized racism remains significantly associated with an increased risk of having abnormal fasting glucose. However, when waist circumference is used as the measure of body fat distribution in the model, the significant relationship of internalized racism to abnormal fasting glucose is no longer apparent.

DISCUSSION

Results from the current study suggest that high levels of internalized racism may have a differential effect, independent of age, education, and level of hostility, on body fat distribution, being more likely to influence the accu-

mulation of abdominal fat than overall body fat. This relationship of internalized racism to waist circumference was also reported in an earlier study of African-Caribbean women on the island of Barbados.⁷ The nature of the relationship of high levels of internalized racism to larger waist circumference is unclear but might be related to the association of internalized racism with lifestyle behaviors such as alcohol consumption. Studies of African Americans have shown that a high level of internalized racism is associated with increased alcohol consumption,¹⁵ which is related to larger waist circumference.¹⁶ An alternative explanation may be that for Western Hemisphere blacks, internalized racism is one factor that predisposes to defeat type responses to environmental stressors. Under Björntorp's hypothesis, this feature of internalized racism would lead to abnormal function of the hypothalamic-pituitary-adrenal axis with poor regulation of cortisol secretion and metabolic abnormalities, including the accumulation of abdominal fat and insulin resistance, and consequently, abnormal glucose tolerance.^{17,18}

Consistent with Björntorp's hypothesis, in the current study, internalized racism was significantly related to an increased likelihood of

having abnormal fasting glucose. Similar results were found in a recent case-control study among African Americans in the U.S. Virgin Islands in which internalized racism was associated with a 2.5-fold increased risk of having newly diagnosed type 2 diabetes. In that study, cases also reported higher levels of hostility than controls. In the current study, adjustment for the level of hostility did not eliminate the significant relationship of internalized racism to elevated fasting glucose. Additional data suggesting that internalized racism may be a marker of abnormal HPA-axis function was provided by the results of logistic regression analyses in the current study, which showed that the significant relationship of internalized racism to abnormal fasting glucose remained after adjustment for body weight or BMI but disappeared when adjustment was made for waist circumference. Given estimates that 15% to 40% of individuals in some African American communities may have high levels of internalized racism,¹⁹ future studies of the association of internalized racism with such features of abnormal HPA axis function as impaired cortisol regulation are recommended.

There are limitations to this study. The study is cross-sectional, and therefore significant associations to not imply causality. Moreover, measurement of fasting glucose was based on a capillary blood sample, which does not provide as accurate an estimate as would venous blood. However, given attempts in the study to insure the accuracy and validity of glucose measurements including selection and use of glucose monitors validated in clinical studies, duplication of blood tests, and validation of elevated glucose results with laboratory-based venous blood measurements, it is felt that use of venous blood in the study would have increased the strength of the results reported.

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