Invited Commentary

Invited Commentary: Discrimination—An Emerging Target for Reducing Risk of Cardiovascular Disease?

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A growing body of research suggests that perceived discrimination, in multiple societies, is a neglected but important predictor of increased risk of disease for a broad range of health status indicators. Several prior studies propose that discrimination is adversely related to increased cardiovascular disease risk. The studies by Hunte (Am J Epidemiol. 2011;173(11):1223–1231) and Lewis et al. (Am J Epidemiol. 2011;173(11):1232–1239) find that self-reported discrimination is associated with increased risk of adiposity for men and women. These studies highlight the potentially important role of discrimination as a risk factor for excess fat but also raise important research questions regarding the role of fat in cardiovascular disease and racial differences in these processes. More generally, they also provide an important reminder to epidemiologists and medical professionals that discrimination and other aspects of racism persist in contemporary society and that increased efforts are needed to document the extent to which they may have pathogenic consequences and to identify the most promising initiatives to reduce any observed negative effects. Equally important, these studies remind us that, although social stressors are difficult to measure accurately and comprehensively, understanding how multiple stressors combine over the life course to affect the risk of morbidity and mortality remains an important priority for concerted research attention.

African Americans; body weight changes; cardiovascular diseases; discrimination (psychology); intra-abdominal fat; obesity, abdominal; stress, psychological; waist circumference

Abbreviation: CVD, cardiovascular disease.

Emerging research suggests that excess compartmental fat depots are associated with increased cardiovascular disease (CVD) risk (1, 2). Specifically, the presence of central obesity in adults heightens the risk of developing the metabolic syndrome and type 2 diabetes (3, 4). Although the prevalence of obesity is higher among blacks than among whites, several lines of evidence indicate racial differences in type of body fat deposits, which have implications for disease-specific development and mortality (5). However, data regarding the prevalence and clinical relevance of abdominal visceral and subcutaneous fat according to race and gender remain mixed (6–8) in part because of variability in control for potential confounders, chiefly total body fat, and insufficient data about contributing factors beyond individual behavioral characteristics.

Nonetheless, a recent and one of the largest studies that examined racial differences in adiposity demonstrated that, whereas abdominal visceral adiposity is more prevalent among white men and women, subcutaneous fat content is significantly higher in black men and women (5). Indeed, abdominal visceral adiposity is particularly associated with adverse health consequences (9). Thus, the findings by Lewis et al. (10) that perceived discrimination was associated with an increased risk of visceral but not subcutaneous fat in black women and white women and by Hunte (11) that change in discrimination is related to change in waist circumference are noteworthy and add in important ways to our understanding of the role of fat in CVD disease in women.

The suggestion that discrimination might affect health is not new. However, systematic empirical study of the health effects of discrimination is less than 3 decades old. Early research focused on blacks and Hispanics in the United States and used self-reported measures of physical and mental health. Recent reviews document the maturing of this
area of research (12–15). Although most studies are still based in the United States, there are empirical studies of populations in Canada, Australia, New Zealand, South Africa, Hong Kong, and almost every country in western Europe (13). The extant research also reveals that discrimination is a newly emerging risk factor for a broad range of health outcomes, and these new studies add visceral fat to a growing list of CVD risk factors.

The existing research on discrimination and health also indicates that this risk factor may make an important contribution to understanding racial and ethnic variations in health. One of the striking patterns to these disparities in the United States is the persistence of a substantial residual effect of race even after indicators of socioeconomic status are included in the analysis (16). From a biologic perspective, although blacks, compared with whites, have a higher relative risk of death based on markers of adiposity such as body mass index, the proportional increase in mortality with a similar category shift in body mass index (e.g., from overweight to obese) is lower for blacks than for whites, suggesting that additional factors might contribute to death such as the direct or indirect effect of discrimination on visceral fat and other CVD risk factors including hypertension (17).

Most of the research on discrimination and health has not explicitly addressed its contribution to accounting for racial disparities in disease. However, both domestic and international studies have documented that discrimination makes an incremental contribution, after socioeconomic status is considered, to explaining racial disparities in health (13).

Studying the effects of discrimination on visceral fat also provides a reminder that stress may matter a lot for health. This study used the everyday discrimination scale—one of the most widely used measures to capture the stress of discrimination in health research (10, 13). This scale captures episodic and minor experiences of discrimination. However, it fails to capture all of the multiple aspects of chronic and acute discrimination and is thus not a comprehensive measure of exposure to discrimination (13). Despite this limitation, even episodic periods of stress can result in up-regulation of sympathetic, inflammatory, and glucocorticoid biologic pathways that serve to stimulate progression of major diseases such as CVD and cancer (18). In this instance, the Lewis et al. (10) analysis indicates that a measure of chronic discrimination, albeit only one aspect of stress, is associated with an increased risk of visceral fat.

Demonstration of this association has potential clinical importance; visceral fat is an endocrine organ and, similar to the potential biologic effect of discrimination as a stressor, is a reservoir of inflammatory substances such as interleukin-6, an upstream regulator of C-reactive protein, and is also associated with insulin resistance and production of free fatty acids (19). Intriguingly, subcutaneous fat is believed to have less robust associations with certain inflammatory and hemostatic markers of CVD risk (19, 20). To this end, basic science and population-based studies show significant associations between these biologic markers and risk of CVD, in part through their effect on vascular endothelial dysfunction and oxidative stress (21, 22).

The prospective analysis by Hunte (11) of everyday discrimination and waist circumference complements the research of Lewis et al. (10) by demonstrating that incident change in waist circumference, a measure that tends to be more correlated with fat mass and subcutaneous fat than with visceral fat, is predicted by change in reports of everyday discrimination (1, 23). Of obvious interest is whether the changes reported by Hunte translate into more subcutaneous versus visceral fat deposition. Because Hunte’s study population consisted primarily of whites and the results were stronger for women who reported increases in everyday discrimination over 9 years of follow-up, on the basis of previous work, it is theoretically possible that visceral fat might be the dominant deposit. Certainly, work by Camhi et al. (23) showed that whites with higher waist circumferences or body mass indexes had higher proportions of visceral fat than blacks with a similar waist circumference or body mass index. Following the hypothesis of a possible threshold effect related to triglyceride deposition in subcutaneous tissue, which in turn can lead to heightened insulin resistance due to a shift to visceral fat deposition, subjects with increasing or persistently high levels of everyday discrimination could therefore be at risk of the metabolic syndrome and type 2 diabetes (24) as well as increased coronary artery disease severity (25).

Notwithstanding this finding, long-term studies of discrimination and its association with any clinical disease entities should take into consideration the effect of physical activity, a factor measured only at baseline in Hunte’s analysis (11), as well as other behavioral variables over time, since the hormonal, metabolic, and inflammatory milieu associated with behavior remains dynamic over time. Evidence of these changes is reported in a randomized examination of diet and physical activity on weight loss, waist circumference, abdominal fat, and hepatic fat content (26). This study by Kuk et al. (26) found that, besides a reduction in weight and waist circumference, significant reductions in abdominal fat and hepatic steatosis were observed at 12 months of follow-up with physical activity in particular.

An important challenge for future work is to go beyond assessing one isolated dimension of stress (such as perceived discrimination) but to model how multiple stressors relate to each other and combine over the life course to affect both the onset of illness and the progression of disease. Research indicates that failure to measure stress comprehensively leads to an underestimate of the effects of stress on health (27). In addition, it is essential to extend the work of Hunte (11) and Lewis et al. (10) to investigate the association between stressors and tissue-specific fat, for example, epicardial fat, a measure that might be more predictive of CVD outcomes (28, 29).

Experiences of discrimination remain a persistent legacy of historic racism in the United States such that the health consequences of racism must be considered at the multiple levels at which they might operate. Recent research documents the persistence of racism in American society despite dramatic declines in racial prejudice (30). For example, audit studies having individuals with identical resumes apply for advertised jobs document that white males are more likely to be hired for a job than are black or Hispanic men with the same qualifications (31, 32). Strikingly, this research also reveals that it is easier for a white male with...
a felony conviction to be offered a job than it is for a black or Hispanic male whose criminal record is clean (31, 32). Other evidence reveals the persistence of negative racial stereotypes that undergird multiple forms of discriminatory behavior. For example, a study of whites in metropolitan Chicago, Illinois, and Detroit, Michigan, revealed that 44% of whites rank blacks as more likely than whites to prefer to live off welfare and that 54% of whites believe that whites do a better job of raising their children than blacks do (33).

Residential segregation by race, although neglected by many researchers studying race and health, is also likely to be a major contributor to racial differences in health status (34, 35). It is an important historic institutional mechanism of racism that has led racial groups in the United States to live in distinct neighborhood environments, resulting in strikingly different exposures to social conditions and economic opportunities that shape opportunities for engaging in health-related behaviors. More systematic efforts are needed to characterize the multiple dimensions of racism and assess how they may combine additively and interactively with other risk factors to affect health and contribute to racial variations in health. One national study found, for example, that eliminating segregation would erase racial differences in income, education, and unemployment and reduce racial differences in single motherhood by two-thirds (36). Thus, experiences of discrimination at the interpersonal level do not comprehensively capture the effects of racism on health in contemporary society.

It is nonetheless instructive that both Hunte (11) and Lewis et al. (10) document that experiences of discrimination matter for obesity-related outcomes for both blacks and whites. These findings are consistent with the broader literature suggesting that, irrespective of attribution, perceptions of discrimination or unfair treatment are adversely related to health, regardless of the racial status of the individuals or groups that report experiencing them (13). For example, in the Whitehall study, perceived unfairness has been related to incident coronary events (37), psychiatric morbidity (38), and the metabolic syndrome (39). Although these studies were not framed within the context of discrimination, the questions regarding unfairness were operationalized with measures similar to those used in the discrimination literature. The current evidence suggests that there may be substantial generalizability to the negative health effects of social incivilities and bias. Additionally, from a public health standpoint, although some researchers tend to focus on health behaviors, such as diet and physical activity, as the primary mechanism for reducing fat, these papers highlight the simultaneous need to target other aspects of psychosocial environments, such as exposure to discriminatory practices, as an important means of reducing disease related to cancer and CVD.

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REFERENCES