Go Red for Women Strategically Focused Research Network Centers

Twenty years ago, the American Heart Association (AHA) pioneered a national initiative to raise awareness of cardiovascular disease (CVD) in women. In 1997, only 1 in 3 women recognized heart disease as their leading killer, and the percentage doubled within a decade. In 2004, the AHA adopted the Red Dress symbol to represent the cause and, in conjunction with the release of the first evidence-based guidelines for the prevention of heart disease in women, launched the Go Red for Women campaign.

The Go Red for Women Strategically Focused Research Network represents another major milestone in the women and heart disease movement. Funded centers are listed in the Figure. Each center has synergistic population, clinical, and basic projects with a shared scientific theme. All centers train fellows and collaborate with each other in the Go Red for Women Strategically Focused Research Network to advance the mission and impact of the AHA.

COLUMBIA UNIVERSITY MEDICAL CENTER

A recent AHA scientific statement highlighted the lack of sleep as an important contributor to obesity, hypertension, diabetes mellitus, and CVD. Women may be at particular risk of abnormal sleep and its consequences because of unique life stages and circumstances, such as caregiving responsibilities and hormonal changes. Despite the importance of sleep as a lifestyle risk factor, screening is not routinely conducted in practice, and evidenced-based recommendations are lacking. The Columbia Center aims to:

1. Document patterns of sleep and their association with cardiometabolic risk factors among 500 diverse women at different life stages in a population-based study;
2. Assess causality through a crossover clinical trial of sleep restriction in a subgroup of women participating in the population-based study;
3. Examine vascular and other basic mechanisms of risk associated with sleep restriction.

This research will contribute to the evidence base needed to elevate poor sleep to the status of other modifiable risk factors for CVD, and will inform lifestyle interventions aimed to prevent CVD among women at risk.

JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE

Heart failure affects 5 to 6 million Americans. Heart failure with preserved ventricular ejection fraction is associated with high morbidity, hospitalization rates, and mortality and is more common in elderly, predominantly female patients, and particularly among blacks. The cause for this sex bias is unknown. The Hopkins
Center will test the hypothesis that the sex bias results from depressed cyclic guanosine monophosphate protein kinase G (cGMP/PKG) signaling postmenopause attributable to loss of sex hormones and aims to do the following:

1. Document the incidence of heart failure with preserved ventricular ejection fraction and associations of sex hormones and nitric oxide/natriuretic peptides-cGMP signaling with cardiac structure and function changes among female participants from large-scale epidemiological studies;
2. Phenotype heart failure with preserved ventricular ejection fraction patients by using sex, sex hormone status, cardiac structure and function, and biomarkers of cGMP/PKG signaling and metabolic parameters;
3. Examine pathways regulating cGMP/PKG signaling between sexes and the role of estrogen status on cardiac and metabolic protection.

This research will help identify novel options for enhancing the cGMP/PKG cascade and determine how to best leverage these in the female population.

MAGEE-WOMENS RESEARCH INSTITUTE AND FOUNDATION

Pregnancy is a complex stressor for women and complications such as preeclampsia have been associated with increased future CVD risk.4 Abnormal placental and maternal microvascular responses to pregnancy may unmask vascular risk and provide early insights into pathways for the development of CVD. The Magee Center aims to do the following:

1. Document that vascular pathology in the placenta can identify women at high risk of CVD, 1 and 10 years postpregnancy;
2. Assess whether erosion of glycocalyx, a protective coating on vascular endothelial cells, is a mechanism of microvascular dysfunction linking pregnancy complications and future CVD risk;
3. Examine mouse models to determine whether pregnancy directly affects CVD, and if the nutrient L-citrulline can be used as a potential therapy to restore the glycocalyx and reduce the progression of atherosclerosis.

This research will generate insight into common mechanisms for vascular and placental pathology, and
how pregnancy-related signals might be used to identify women at increased CVD risk later in life.

THE SARAH ROSS SOTER CENTER FOR WOMEN’S CARDIOVASCULAR RESEARCH AT NEW YORK UNIVERSITY LANGONE MEDICAL CENTER

Women with myocardial infarction (MI) have a higher prevalence of nonobstructive coronary artery disease at angiography (MINOCA) than do men.\(^5\) Mechanisms of MINOCA are varied. Optimal treatment of MINOCA is likely to differ substantially depending on underlying etiology. Thrombosis is critical in the pathogenesis of MI and recurrent events, but the role of platelets in MINOCA is not established. Women report more stress after MI than do men, which may contribute to women’s poorer post-MI recovery. The New York University Center aims to do the following:

1. Determine the effect of a behavioral intervention on stress and quality of life among women after MI;
2. Investigate mechanisms of MINOCA using intracoronary imaging and cardiac MRI in a multicenter study;
3. Examine platelet activity, genetics, and cellular interactions among women with MINOCA, MI with obstructive coronary artery disease, and stable nonobstructive coronary artery disease.

This research will increase our understanding of sex-based differences in the pathophysiology of MI and may help physicians tailor treatment to women.

UNIVERSITY OF CALIFORNIA, SAN DIEGO

Sedentary behavior is a risk factor that is especially challenging among Latina women at heightened CVD risk. There is growing evidence that physical inactivity is correlated with social, cultural, and environmental factors. Both family and workplace structure and environment may facilitate sitting and increase CVD risk. The University of California, San Diego Center aims to do the following:

1. Document biopsychosocial and ecological associations with waking time sedentary behavior in the home and workplace among 400 female participants in the Hispanics Community Health Study—Study of Latinos;
2. Assess 3-month changes in sitting time, standing time, physical activity, and blood pressure in a randomized control trial among postmenopausal obese Latina women with borderline hypertension who spend at least 8 hours/day sitting;
3. Examine the mechanisms of sedentary behavior—associated CVD risk and modifiable behaviors that influence these mechanisms.

This research will provide insight into how sitting affects CVD risk in a high-risk population of women of Mexican heritage and may inform future work aimed to evaluate standing and ecological interventions to enable physical activity.

DISCLOSURES

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FOOTNOTES

Circulation is available at http://circ.ahajournals.org.

REFERENCES
