MAYO CLINIC

Focused Cardiovascular Care for Women: The Need and Role in Clinical Practice

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Abstract

Over the past decade, an emerging clinical research focus on cardiovascular (CV) disease (CVD) risk in women has highlighted sex-specific factors that are uniquely important in the prevention and early detection of coronary atherosclerosis in women. Concurrently, a 30% decrease in the number of female deaths from CVD has been observed. Despite this, CVD continues to be the leading cause of death in women, outnumbering deaths from all other causes combined. Clinical practice approaches that focus on the unique aspects of CV care for women are needed to provide necessary resources for the prevention, diagnosis, and treatment of CVD in women. In addition to increasing opportunities for women to participate in CV research, Women's Heart Clinics offer unique settings in which to deliver comprehensive CV care and education, ensuring appropriate diagnostic testing, while monitoring effectiveness of treatment. This article reviews the emerging need and role of focused CV care to address sex-specific aspects of diagnosis and treatment of CVD in women.

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According to the most recent US annual mortality statistics, cardiovascular (CV) disease (CVD) accounted for 398,035 female deaths, exceeding the number of female lives lost to malignant neoplasms, chronic lower respiratory tract diseases, and diabetes mellitus combined.[1] During the past 2 decades, CVD mortality rates have decreased in both men and women. Unfortunately, this rate has not decreased in parallel in women, especially those in midlife (ages 35-50 years), in whom CVD mortality has slightly increased or stagnated.[2-6] At the last assessment, only 56% of American women were aware that CVD is the primary cause of death in women and only 13% perceived this as the major risk to their personal health.[7-9] Moreover, marked racial, ethnic, and age disparity exists, with fewer black, Hispanic, and younger women possessing this awareness.[7] This knowledge gap persists despite the fact that a focused effort to rectify this situation was initiated in 2004 through the launch of major national awareness programs including the National Heart, Lung, and Blood Institute's "*Heart Truth*" and the American Heart Association (AHA)'s "*Go Red*®" campaigns.

Beyond routine CVD prevention, diagnosis, treatment, and education, Women's Heart Clinics can address CVD conditions and risks that *exclusively affect* women, including adverse pregnancy outcomes, peripartum cardiomyopathy (PPCM), polycystic ovary syndrome (PCOS), menopause, and menopausal hormone therapy (MHT) concerns, as well as CVD conditions that *disproportionately affect* women, including coronary microvascular dysfunction (CMD), spontaneous coronary artery dissection (SCAD), apical ballooning syndrome, inflammatory conditions associated with autoimmune disorders, peripheral arterial disease (PAD), heart failure with preserved ejection fraction (HFpEF), and postural orthostatic tachycardia syndrome (POTS). Lack of physician awareness and understanding of pathophysiological differences in heart disease in women have underscored a profound knowledge gap about optimal prevention strategies, diagnostic methods, and responses to both medical and surgical therapies for CVD in women. Existing guidelines for the prevention

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of heart disease in women have been endorsed by major professional associations, yet are not routinely being translated into practice, generating a marked difference between what is currently being achieved in clinical practice and what could potentially be achieved.[10]

This article was conceived at a satellite symposium held in conjunction with the 2012 Scientific Sessions of the AHA, "Women and Heart Disease: New Insights Across the Lifespan," and includes additional updates to serve as a review of the contemporary status of CV care for women. The purpose of this communication was to provide guidance on CV care for women and to encourage the establishment of focused centers for this care. These focused centers are often termed *Women's Heart Clinics* and are staffed by providers who are familiar with sex- and gender-specific CV issues, resulting in better outcomes for women at risk of and living with CVD. The care model that we have found most effective is a team-based approach, consisting of CV subspecialty physicians and certified nurse practitioners, with available multidisciplinary and collaborative consultative resources to provide nutritional, physical activity, behavioral, rehabilitative, complementary, and integrative medical, interventional, and surgical support. MEDLINE and PubMed databases were searched for literature published from September 1, 1994 to September 1, 2015. Searches included CVD in women plus the following terms: adverse pregnancy outcomes, polycystic ovary syndrome, menopause, and menopausal hormone therapy, autoimmune disorders, peripheral arterial disease. Other relevant searches included Women's Heart Clinics, peripartum cardiomyopathy, coronary microvascular dysfunction, spontaneous coronary artery dissection, apical ballooning syndrome, heart failure with preserved ejection fraction, and postural orthostatic tachycardia syndrome. Publications were classified as English-only original data, reviews, and clinical guidelines. Nonpublished data were excluded.

ARTICLE HIGHLIGHTS

- The emerging recognition of sex-based disparities in the treatment of, and survival from, heart disease has underscored a knowledge gap in the awareness, prevention, diagnosis, and treatment of heart disease in women.
- This review article provides an overview of our current understanding of cardiovascular physiology and pathophysiology across a woman's life span, identifying those cardiovascular disease entities that are either uniquely or more often seen in women. Novel approaches to the evaluation and treatment of these disorders are discussed. The identification of newly recognized cardiovascular risk factors unique to women is addressed.
- The concept of focused sex-specific cardiovascular care for women is new. We review the need for integrated multidisciplinary programs in women's heart health and disease. Unique approaches to primary and secondary preventive strategies, diagnostic testing, and treatment of ischemic heart disease in women are introduced.

ASPECTS OF CV PHYSIOLOGY UNIQUE TO WOMEN

The 2010 publication of the Institute of Medicine "Women's Health Research: Progress, Pitfalls, and Promise"[11] highlighted the fact that women's health involves both sex- and gender-specific differences. A number of factors contribute to the sex-specific differences in CVD morbidity and mortality, including biological variances due to sex chromosomes and complex effects that sex steroid hormones have on the CV system. These differences result in variations in the prevalence and presentation of CV conditions including those associated with autonomic regulation, hypertension, diabetes, and vascular and cardiac remodeling. Thus, CV conditions fall into 3 general categories: those unique to a single sex, those occurring in both sexes but with sex-specific differences in prevalence, and those that present differently in women than in men.[12] Modulation of physiological control mechanisms is most apparent in 2 conditions that are unique to women and are characterized by changes in the hormonal environment: pregnancy and menopause.

CV CONDITIONS AND PREGNANCY

CV Adaptations to Normal Pregnancy: A "Natural Stress Test" for Women

In normal pregnancy, the female body undergoes remarkable physiologic, metabolic, and hemodynamic changes needed to support fetal health.